

# **Direction for Conservation and Reclamation Submissions**

**Under an *Environmental Protection and  
Enhancement Act* Approval for  
Enhanced Recovery In Situ Oil Sands  
and Heavy Oil Processing Plants and  
Oil Production Sites**

**February 2016**

**Alberta Energy Regulator**

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# 1 Preface

Specified Enactment Direction 001, *Direction for Conservation and Reclamation Submissions Under an Environmental Protection and Enhancement Act Approval for Enhanced Recovery In Situ Oil Sands and Heavy Oil Processing Plants and Oil Production Sites* (SED), through the consolidation and updating of the requirements, replaces

- *Manual 010: Guidelines for the Submission of a Predisturbance Assessment and Conservation & Reclamation Plan*, Alberta Energy Regulator, October 2014, and
- *Guidelines for Submission of an Annual Conservation and Reclamation Report*, Alberta Energy Regulator, March 2014.

This SED has also been updated to include the requirement of *Environmental Protection and Enhancement Act (EPEA)* approval terms and conditions to complete a project-level conservation, reclamation, and closure plan. This guidance for development of the PLCRCP had previously not been documented.

This SED outlines the criteria for the collection, content, reporting, and submission of conservation and reclamation information to the Alberta Energy Regulator (AER) to fulfill the regulatory requirements of *EPEA* approval terms and conditions for a commercial in situ oil sands facility.

This consolidation and alignment of requirements results in clarification of information submissions, more consistency, and less duplication with enhanced regulatory oversight. The requirements in this SED identify the criteria for fulfilling the conservation and reclamation submissions for *EPEA* approval terms and conditions for enhanced recovery in situ oil sands and heavy oil processing plants and oil production sites (i.e., a commercial in situ oil sands facility).

The requirements outlined in this SED must be fulfilled by approval holders in order to demonstrate compliance with *EPEA* approval terms and conditions.

*EPEA* approval holders must meet all applicable requirements in this SED unless otherwise authorized or directed by the AER. Approval holders are encouraged to ask the AER any questions they might have about this SED.

The terms used in this SED are consistent with the terms defined in *EPEA* and in *EPEA* approvals. Terms not previously used are defined in the appendix 2 glossary.

## 2 Introduction

### 2.1 Overview

Due to the longevity of a commercial in situ development, conservation and reclamation planning must be undertaken throughout the life of the project. This is especially important during site-specific planning where on-site activities can be adapted and updated based on actual site development and reclamation technologies.

This SED is separated into four parts for conservation and reclamation requirements:

- Project-level conservation, reclamation, and closure plan
- Predisturbance assessment information (preconstruction information)
- Conservation and construction plan
- Annual conservation and reclamation report

The separation of what conservation and reclamation information is collected, when information is provided, and how information is to be reported is meant to help the AER develop and manage regulatory processes that are effective and efficient while ensuring that energy development occurs in an environmentally responsible manner. The conservation and reclamation regulatory submissions are compared in appendix 3.

With respect to the decommissioning plan or land reclamation plan required under the *EPEA* approval, refer to the decommissioning section in schedule IX of the *EPEA* approval. This SED does not include guidance on the preparation of these plans.

### 2.2 Regulatory Requirements

The *EPEA* is one of the regulatory instruments that supports and promotes the protection, enhancement, and wise use of the environment. A critical component of *EPEA* is the requirement to integrate environmental protection and economic decisions at the earliest stages of planning.

Section 3 of *EPEA's Approvals and Registrations Procedure Regulation (A&RP Regulation)* stipulates that an application for an approval under *EPEA* must be accompanied by information on the impact of the proposed activity and a conservation and reclamation plan:

3(1) An application must be made to the [Regulator] and must be accompanied by the following information relative to the activity, the change to the activity or the proposed amendment, addition or deletion of the term or condition:

- (m) any impact, including surface disturbance, that may or will result from the activity, the change to the activity or the amendment, addition or deletion, as the case may be;
- (p) the conservation and reclamation plan for the activity;

The requirements under an *EPEA* application and subsequent approval for conservation and reclamation help to demonstrate the predisturbance conditions before construction begins in order to ensure that effective site-specific conservation planning occurs. Section 137 of *EPEA* outlines an operator's requirement to conserve, to reclaim, and to obtain a reclamation certificate for specified land. Operators need to ensure that activities that will be undertaken during the various phases of construction, operation, and reclamation are appropriate for ensuring that the disturbed areas will be reclaimed to an equivalent land capability as defined in the *Conservation & Reclamation Regulation (CRR)*. Reclamation certification for specified land is assessed against *EPEA*, *CRR*, and *EPEA* approval terms and conditions and applicable regulatory guidelines.

The requirements for enhanced recovery in situ oil sands and heavy oil processing plants and oil production sites under *EPEA* approval terms and conditions within *EPEA* schedule IX typically are as follows:

- 1) Project-level conservation, reclamation, and closure plan (PLCRCP)
  - a) The submission of a PLCRCP to the AER is a requirement of the *EPEA* approval and is designed to meet the terms and conditions outlined in *EPEA* approvals.
  - b) The PLCRCP is a tool for evaluating the alignment of site-specific conservation and reclamation activities with the project-level goals.
  - c) The approval holder must conduct all conservation and reclamation activities in accordance with the PLCRCP authorized by the AER.
- 2) Predisturbance assessment information
  - a) Submission of a predisturbance assessment (PDA) is a requirement of the *EPEA* approval.
  - b) Under the *EPEA* approval, predisturbance information is required to be collected before beginning construction to support the conservation plan and reclamation objectives, to confirm the potential effects of the approved activity, and to identify new risks and mitigations necessary before site construction.
  - c) The approval holder is required to collect and submit the predisturbance information in accordance with the *EPEA* approval and this SED, unless otherwise notified in writing by the AER.
- 3) Conservation and construction plan
  - a) Submission of a conservation plan is required under the *EPEA* approval.
  - b) This SED outlines the preconstruction planning to be completed at a site level to conserve resources and minimize disturbance footprint. Planning is based on the predisturbance information referenced in clause 2 and considers future requirements for achieving equivalent land capability.
- 4) Annual conservation and reclamation report (annual C&R report)
  - a) Submission of an annual C&R report is a requirement of an *EPEA* approval.

- b) The annual C&R report standardizes the reporting of the conservation and reclamation information required to demonstrate compliance with terms and conditions of the *EPEA* approval and provides a record of surface disturbance to demonstrate successful conservation and reclamation.
- c) The postconstruction information provides the results of construction in the annual C&R report in order to confirm the conservation of reclamation material to support future reclamation and the achievement of equivalent land capability.
- d) The approval holder is required to generate and submit the annual C&R report in accordance with the *EPEA* approval and this SED unless otherwise notified in writing by the AER.

## 2.3 General Expectations and Methods

The information in this section is for any of the submission requirements within this SED. Approval holders are encouraged to contact the AER at the earliest opportunity to discuss any unique or site-specific circumstances in order to ensure that this SED's requirements are appropriately interpreted.

### 2.3.1. Reporting Expectations

- Terminology used in this SED will follow the glossary of terms (appendix 2) and the *EPEA* approval, act, and regulations.
- Footnotes are encouraged for brief explanatory comments where appropriate.
- Tables in this SED are samples only. The content identified in the tables must be provided; however, the format may be altered.
- Extend tables beyond their default lengths as necessary to ensure complete reporting.
- Provide a list of any references, personal communications, or websites accessed or used to support the information in this SED.
- Information provided in this SED must be applied to all areas regulated under the *EPEA* approval, as amended, for the project but should not include those activities not covered by the *EPEA* approval, such as seismic activity, exploration activity, and source water wells. If there is uncertainty about what is exempt, please contact the AER.
- Provide any other information as required by this SED, by *EPEA* approval, or as otherwise notified in writing by the AER.

### 2.3.2. Methods

When the information is compiled and provided to the AER, the methods used to collect the information is to be described. This information should be subdivided based on the different information requirements outlined in this SED.



Method descriptions should include the following:

- Collection of background information
- Field data collection and analysis
- Spatial analysis
- Reporting

### **3 Project-Level Conservation, Reclamation, and Closure Plan**

#### **3.1 Context**

A PLCRCP is required under *EPEA* approval terms and conditions for commercial in situ facilities. It depicts the approval holder's conservation and reclamation plans following project approval. The PLCRCP is updated through the life of the project and is to incorporate research findings, monitoring results and best practices, which reflect an adaptive management approach to conservation and reclamation.

The PLCRCP is a project-level plan for achieving equivalent land capability and long-term sustainable reclamation outcomes after closure. The PLCRCP is a tool for evaluating the alignment of site-specific conservation and reclamation activities with project-level goals and objectives. It acts as an update to the conceptual conservation and reclamation plan (CCR) submitted with the environmental impact assessment (EIA) and the *EPEA* application for the project. The PLCRCP is an interface between AER regulatory requirements and enactments, including the EIA, *EPEA*, the *Oils Sands Conservation Act*, the *Public Lands Act*, the *Water Act*, and the site-specific conservation and reclamation information and other plans and reports required by the *EPEA* approval.

#### **3.2 PLCRCP Boundary and Planning Considerations**

The PLCRCP boundary includes all of the infrastructure, facilities, and land that are being used or that have been used for, or that will be used or held for or in connection with, the production of bitumen or heavy oil. The boundary includes, among other things, the central processing facility, well pads, borrow pits, and corridors, including disposal pipelines and wells, and is to be consistent with the *EPEA* application and other *EPEA* approval terms and conditions. All sites that are part of a commercial in situ oil sands development (the project), including those constructed before this SED was issued, must be included in the PLCRCP.

Within the PLCRCP boundary there may be areas in which no development is planned and that can be captured in the PLCRCP as specific conservation, reclamation, and closure management areas (CRCMAs). CRCMAs can be updated throughout the life cycle of the project through future PLCRCP submissions.

All previous PDA/C&R plans submitted under the terms and conditions of an *EPEA* approval remain valid. Where a previously submitted PDA/C&R plan needs to be revised, the changes must be incorporated into

the PLCRCP to achieve alignment. Alternatively, where construction has been completed, an approval holder can integrate all previously submitted PDA/C&R plans into the PLCRCP. The authorized PLCRCP will then supersede all previously submitted PDA/C&R plans.

The PLCRCP addresses geophysical and biophysical conditions within the PLCRCP boundary and highlights the project- or site-specific constraints. Information must be presented at a scale that is more specific than the EIA completed in the project application; however, the information collected as part of the environmental assessment (EA) process may be used in the development of the PLCRCP. As development occurs and as project components are developed and more data is collected, the data must be incorporated into PLCRCP updates.

When completing a PLCRCP, you are to identify shared infrastructure that is the responsibility of the approval holder, and you are to identify areas of regulatory overlap unless justification for the exclusion is provided.

### 3.3 Implementation

The PLCRCP must be implemented as authorized in writing by the AER. Once the plan has been authorized, the approval holder is expected to conduct all conservation and reclamation activities in accordance with the authorized plan. Any unauthorized variance from the authorized plan may be noncompliant with the *EPEA* approval terms and conditions.

Any proposed changes to the PLCRCP will need to be submitted to the AER for written authorization either as an update to the PLCRCP or with the future PLCRCP submission, depending on when construction or reclamation of the site is to occur; e.g., in circumstances where additional predisturbance information collected for a specific disturbance indicates that an ecosite phase is completely different than what was identified for the CRCMA and, as a result, the revegetation plan in the authorized PLCRCP may need to be updated accordingly. Since the reclamation will not occur before the next PLCRCP submission, the plan can be revised at the time of the PLCRCP submission.

If the approval holder is unsure whether an update to the PLCRCP is required, the approval holder must contact the AER for direction.

### 3.4 Submitting the PLCRCP

PLCRCPs will follow the same regulatory review process as *EPEA* plans, proposals, and authorizations.

PLCRCPs are to be submitted electronically to [EPEA.WA.Plans.Authorizations@ aer.ca](mailto:EPEA.WA.Plans.Authorizations@ aer.ca). Following the initial submission of the PLCRCP, the PLCRCP must be submitted every five years unless otherwise authorized by the AER. If there is no update at the five-year period, the *EPEA* approval holder is to provide written confirmation on why there are no updates to the PLCRCP (e.g., no new construction or reclamation

scheduled). The project-specific need for an update to the PLCRCP outside of the events above must be discussed with the AER prior to submission.

The annual C&R report will report on components of the PLCRCP to verify annual progress of planned development and construction, conservation, and reclamation activities. Approval holders are required to include specific references (e.g., sections, page numbers) to its authorized PLCRCP in its annual C&R reports and confirm consistency between planned conservation and reclamation activities and the activities that took place. Refer to section 6 for the annual C&R report requirements.

### 3.5 PLCRCP Mapping Requirements

#### 3.5.1. Map A: Project Overview Map

Provide a map that shows all aspects of the overall project that have been approved under the *EPEA* approval. Choose an appropriate map scale to capture the project and project components.

#### 3.5.2. Map B: Predisturbance Setting

Provide a map of the predisturbance conditions specific to the PLCRCP boundary (landforms, topography, vegetation, hydrologic features) at a presentation scale of 1:20 000 with a minimum delineation unit of 2 hectares (ha). Include with the map the following information:

- Illustration of the main ecosites, wetland classes, site types, or some combination, that would be used to create map C (see section 3.5.3) where conservation, reclamation, and closure management areas will be defined. Where site type is used, include a table showing a range of ecosites that are expected in the site.
- Overlain and annotated proposed approved development plans, current and future approved disturbance sites related to existing approvals, sites under current reclamation, and any applied-for or approved expansion of the project.
- Environmental and landscape features.
- Constraints (environmental or commitment based).

Note: The information presented as part of an EIA may be used in conjunction with any additional data collected to develop this map.

#### 3.5.3. Map C: Conservation, Reclamation, and Closure Management Areas

Provide a map of the project-level conservation, reclamation, and closure management areas defined in section 3.6.4, table 3 at a presentation scale of 1:10 000 that contains the following information:

- Current and future approved disturbance footprints (sites). Include sites that were constructed before current regulatory requirements of March 1, 2016, and identify sites that do not align with PLCRCP.

#### 3.5.4. Map D: Project-Level Conservation, Reclamation, and Closure Plan – Postreclamation

Provide a map that depicts the reclamation sequencing, including progressive reclamation and the final reclaimed landscape with implementation of the PLCRCP at a presentation scale of 1:20 000 that contains the following information:

- Reclamation timelines in ten-year increments for the duration of the plan
- Hydrologic features to show connectivity across the landscape
- The boundaries of sites that were disturbed by operations during the life of the project.

### 3.6 Project-Level Conservation, Reclamation, and Closure Plan Content Requirements

#### 3.6.1. Project Summary

Provide a brief summary of the location of the project, the approved infrastructure that will be built (or is in place), and any other high level details related to the project scope and describe how the conservation and reclamation objectives and commitments of the combined EIAs and applications (*EPEA, Oil Sands Conservation Act, Public Lands Act, and Water Act*) for the project will help achieve project level closure. Note any applicable connectivity considerations with landscape-level environmental features or boundary neighbor infrastructure.

#### 3.6.2. Conservation, Reclamation, and Closure Management Areas

CRCMAs are areas where conservation and reclamation practices will remain consistent based on similar environmental features or constraints. Caribou ranges, potential fish spawning areas, potential rare-plant communities, soils requiring special treatment, key wildlife and biodiversity zones, landscape hills or valleys, and groundwater recharge and discharge areas are examples of environmental characteristics, biophysical features, or boundaries that can support the delineation of the CRCMAs.

Approval holders are encouraged to define CRCMA boundaries based on site, area, or project-specific conditions, constraints, and commitments. For example, this may include identifying areas within the project that have no planned development as a single CRCMA.

Define and list the selected CRCMAs to be discussed in the PLCRCP. Include the rationale that was used to select the CRCMAs (see table 1 for examples). Provide map C (see section 3.5.2) outlining the CRCMAs. For each area, describe the criteria that made the area unique. Identify any relevant CCR constraints in the CRCMAs.

**Table 1. Project-level conservation, reclamation, and closure management areas summary**

<b>CRCMA identifier</b>	<b>Rationale/description</b>	<b>Environmental constraints</b>
CRCMA 1	This particular CRCMA was selected because....	Mineral soils Ecosite ?
CRCMA 2	This particular CRCMA was selected because....	Environmentally significant area, Thickwood patterned fen Deep peat ?
CRCMA 3	This particular CRCMA was selected because....	No disturbances or development planned
CRCMA 4	This particular CRCMA was selected because....	Culturally important area—special First Nations commitments

### 3.6.3. Current State of Environment and Project-Level Reclamation Targets

Summarize the current predisturbance information to establish the current state of the environment that will be used to define each CRCMA. This information should be consistent with the EIA, *EPEA* application, postconstruction information, and any other predisturbance assessment conducted within the project. Include a summary or tables outlining existing topography, ecosites, wetland classes, hydrologic features, landscape features, and current and future disturbance sites. Provide map A (see section 3.5.1) that shows predisturbance conditions.

Provide confirmation that the reclamation targets defined for the project as a whole and for each CRCMA are equivalent to the predisturbance landscape and with plans to achieve the conservation, reclamation, and closure outcomes. Provide a table of the comparison between predisturbance and closure-targeted ecosites, wetland classes, and site types, or some combination (see table 2) and a brief discussion.

*Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region*, 2nd edition, 2009, as amended may be used to plan reclamation targets.

**Table 2. Project-level predisturbance and reclamation target comparison table**

<b>Ecosite or wetland class or site type<sup>1</sup></b>	<b>Ecosites or ecosite phases or wetland classes or site type (predisturbance)</b>		<b>Ecosites or wetland classes or site types within PLCRCP boundary (reclamation targets)</b>	
	<b>Area (ha)</b>	<b>Percentage (%)</b>	<b>Area (ha)</b>	<b>Percentage (%)</b>
Ecosite 1	2			
Wetland 1	3			
		<b>100</b>		<b>100</b>

<sup>1</sup> Where site type is used, identify the range of ecosites that are expected within the site.

#### 3.6.4. Alignment of the PLCRCP with Environmental Constraints, Associated Commitments, and Planned Mitigations

Outline how the PLCRCP is aligned with the constraints, commitments, and planned mitigation identified in the EIA and the *EPEA* application and required by regulatory plans for conservation and reclamation that apply to the project. Include a summary table of the conservation, reclamation, and closure constraints, commitments, and mitigation that have been made for the project, including environmental characteristics, biophysical features, or boundaries, together with any other area considered in the planning. Area regional plans (e.g., the Lower Athabasca Regional Plan) and integrated resource plans might help identify environmental features and associated mitigation requirements. Include this information on the appropriate maps in section 3.5.

Project-specific commitments related to conservation, reclamation, and closure must be identified and discussed, with the exception of confidential commitments to stakeholders (see table 3; note that table 3 is only an example).

The PLCRCP must align with existing planned mitigation required by regulatory plans that will influence the conservation and reclamation outcomes. Include these details in a table (table 3 is an example) that depicts where the approval holder's existing regulatory plans are captured in the PLCRCP, and that demonstrates how commitments are being considered through conservation and reclamation activities. For example, if an operator made a commitment in its wildlife mitigation and monitoring plan to limit impacts on a specific habitat through physical avoidance, the PLCRCP should consider that habitat when defining CRCMAs, and it should discuss how commitments will be met through conservation and reclamation mitigation strategies for the area. Table 3 should only contain those CRCMAs that have constraints or mitigation commitments.

The use of unique identifiers such as mitigation identification numbers and constraint identification numbers is optional. Also note that in the example table (i.e., table 3), mitigation conservation (MC) actions and mitigation reclamation (MR) actions are identified separately. The constraints, commitments, and planned mitigation provided in table 3 should not restate the *EPEA* approval terms and conditions.

**Table 3. Project-level conservation, reclamation, and closure constraints, commitments, and mitigation**

ID	CRCMA	Constraint/commitment/mitigation	Description	Mitigation ID*	Mitigation descriptions	Source of constraint/commitment
C1	CRCMA 1	May Lake Trail	Area designated for recreational use. Includes a 100 m buffer. Development of pads, wells, and facilities is not permitted. Approved crossings (pipelines and roads) are permitted.	MC-A	Avoidance—no pads, wells, or facilities within the defined boundary.	AB Gov Doc Name
				MC-B	Retain soils—retain soils for placement at the salvage location.	EPEA
				MR-A	Full removal of facilities—upon reclamation of crossing, ensure that obstructions to the trail are removed and that the trail remains available for use by the public.	AB Gov Doc Name
				MR-B	Clay structure removal requirement—full removal of facilities is not mandatory where the value of the area of constraint can be maintained.	EIA
C4	CRCMA 2	Clay structure compaction	Stakeholder concern over compaction of clay structures that are being left in place	MR-E	Deep rip up to 50 cm.	SOC #xxx
C5	CRCMA 4	Ecosite a	.....	MC-x	.....	Xxx
				MR-x	.....	Xxx

\*MR: mitigation reclamation  
 MC: mitigation conservation

### 3.6.5. CRCMA Description

For each CRCMA, where applicable, include a description of proposed strategies or results, or both, for the following topics, in either text or table format (the strategies can be linked to multiple CRCMAs to which they apply):

- Conservation
  - Provide a summary of the reclamation material conserved within the CRCMA and any specific best management practices (e.g., subsoil stripping where not mandated by *EPEA* approval; overstripping; avoidance).
  - Provide a description of possible impacts and potential mitigation techniques that can be used to maintain surface water drainage and hydrology characteristics.
- Postconstruction and temporary reclamation
  - Provide a description of activities that will be implemented (e.g., partial pad removal after decommissioning of well pad infrastructure).

- Infrastructure management
  - Provide a description of the infrastructure management strategies for mechanical infrastructure, buried infrastructure and earthworks structures (e.g., piles to be cut off X metres [m] below surface; buried pipelines to be pigged and abandoned in place; pads to be removed or left in place and recontoured; geotextile management), and any proposal for roads that may be left in place for stakeholder or Crown use, and say whether formal agreements or authorizations are pending.
- Permanent reclamation
  - Discuss the end land use objectives, including planned variations from previously submitted EIAs or plans.
  - Describe postreclamation topography, including the following:
    - Identification of any topographic conditions that may require special consideration, as well as a proposed mitigation approach
    - Postreclamation goals for topography, including a description of reclamation topography relative to the surrounding topography
    - Postreclamation drainage design, including a discussion of wetland replacement (if applicable), and a plan outlining the re-establishment of drainage patterns
    - Management of fill material, where applicable
  - Describe reclamation material placement, including the following:
    - Replacement depth targets for both topsoil and subsoil (including rationale)
    - Identification of any soil conditions that may require special consideration or handling techniques, as well as a proposed mitigation approach (including de-compaction of subsoil, remediation of contaminants, organic soil handling, seasonal soil replacement, etc.)
    - Any constraints (e.g., salinity, sodicity, pH) of pad fill materials and how such constraints will be managed during construction operations and final reclamation
    - Erosion potential and mitigative measures for disturbed areas
    - Potential for loss of topsoil and degradation of topsoil quality;
  - Discuss soil replacement in relation to
    - topography (especially for wet soils)
    - woody material rollback.
  - Explain how site drainage and surface water hydrology will be restored or maintained at closure and how topography will be integrated with adjacent undisturbed lands (e.g., recontouring pads left in



place to match surrounding topography; reclaiming pads in peatland in a manner that restores wetland function; removing water management structures).

- Describe any permanent changes in site conditions (e.g., conversion of wetland to upland, or fen to marsh).
- Describe the strategy for revegetating reclaimed areas, including natural revegetation, planting of trees or plugs, and seeding, and include the following:
  - Identification of postreclamation goals and objectives
  - Identification of a range of target ecosites for any given site
  - Information about adjacent vegetation and how the revegetation will integrate with it
  - A seeding plan that addresses end land-use objectives (including an approved weed-free native seed mix)
  - Species list, seed source and quality, and seeding rates and methods
  - Reforestation strategies that comply with the requirements of the *Alberta Forest Genetic Resource Management and Conservation Standards* (Alberta Sustainable Resource Development [ASRD] 2009) and any Government of Alberta policy related to the deployment of propagules for use in reclamation
  - Information about areas where reforestation will occur
  - Justification for areas where reforestation is not proposed
  - Fertilization rates and methods
  - Vegetation management
  - Weed control strategies for the reclaimed site
  - Wildlife habitat strategies, where applicable
- If some of the revegetation activities noted above are the same for multiple CRCMAs or for the project, consolidate and reference them accordingly (e.g., weed control).
- Refer to any existing revegetation plans in this section; however, they need to be linked back to the CRCMAs that they apply to.
- Identify in this section any variations, from existing revegetation plans or from a revegetation plan submitted, that are specific to the CRCMA.
- End land-use objectives
  - Describe the project's end land-use objectives that are applied to the reclamation and closure planning for each CRCMA. The PLCRCP should ensure that continuity of wildlife habitat and corridors, drainage, and landforms between CRCMAs and for activities within and beside the project

boundaries is integrated to the extent possible. The description should be brief, consider the predisturbance information, and support the closure maps and tables (refer to sections 3.5 and 3.6).

#### 3.6.6. Project-Level Reclamation Materials Balance

This section describes the reclamation material balance across the project and includes the following:

- Current stockpile volumes and material types, compared to reclamation needs with consideration of the target ecosites for each CRCMA
- Current materials deficits that need to be addressed for the project
- A discussion of the reclamation challenges and the mitigation options that can be and will be pursued
- Links to any changes to closure end land use proposed in this PLCRCP
- Options to move materials between *Public Lands Act* dispositions, acknowledging that authorization will be obtained before implementing the proposed plan

#### 3.6.7. Reclamation and Closure Activity Timelines

Provide a forecast of the sequence of project activities in ten-year increments for the life of the project. Identify and quantify the areas of conservation, disturbance, and progression of reclamation. Provide a summary of reclamation progression for the project, and include map D (see section 3.5.3).

#### 3.6.8. Adaptive Management

This section includes a brief summary of how the conservation and reclamation outcomes of monitoring and research will be or have been used in planning, adaptive management, and revision of the PLCRCP. This would also include updating the PLCRCP based on predisturbance and postconstruction information to ensure that the conservation and reclamation activities can be achieved. Also, provide a brief discussion of the strategy and actions that will be taken to ensure that conservation and reclamation activities and outcomes continue to meet the requirements and objectives of the authorized PLCRCP.

Where applicable in the PLCRCP, a discussion should be provided on how the results of the reclamation monitoring program have been or will be used in adaptive management for reclamation.

## 4 Predisturbance Assessment Information

### 4.1 Context

This section outlines the data collection, reporting, and submission requirements for the assessment of the predisturbance conditions of a site before construction begins. Site disturbance includes vegetation clearing.

The predisturbance assessment information

- supports evaluation of the potential effects of the activity and of the required mitigation measures;
- is the basis for the development of a site-specific conservation and construction plan; and
- is used as a guide for achieving successful reclamation upon facility closure.

Understanding the site-specific conditions is essential for confirming that approval holders are taking appropriate steps to minimize disturbance and conserve resources for use later in reclamation, and for achieving better environmental outcomes and overall conservation and reclamation objectives. The predisturbance assessment must include a description of any environmental issues and considerations associated with the development, together with any specific mitigation techniques or variances.

Project footprint and placement should be near its final stage of planning before any on-site field assessment or verification is completed. This includes completing regulatory requirements under the *Public Lands Act* to occupy and access a specific piece of public land.

The dates on which onsite predisturbance information was collected must be identified in submitted documentation (e.g., annual C&R report; refer to section 6 below). Onsite field-data collection must be completed by qualified individuals (refer to glossary in appendix 2).

Development and documentation of the biophysical setting of the predisturbance conditions can use existing information that may be available from

- EIAs;
- previously completed conservation and reclamation plans from *EPEA* applications;
- other regulatory approvals;
- construction documents;
- rare-plant occurrences (based on the Alberta Conservation Information Management System [ACIMS]: [http://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-\(acims\).aspx](http://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-(acims).aspx));
- soil survey information;
- remote sensing data (aerial photographs, digital imagery interpretation [satellite or airborne]);

- Alberta Vegetation Inventory (AVI) data;
- Alberta Wetlands Inventory (AWI) data;
- regional vegetation (or ecosite) surveys; and
- information on existing disturbances or previously disturbed lands, and other relevant documents.

Where previously collected information doesn't meet the specifications and densities described below, additional site-specific data collection will be required.

If a previously disturbed area exists within the new proposed land disturbance area, a description of the nature and current status of the existing disturbance (e.g., cleared, soil salvaged, reclaimed with soil replacement, reclaimed with vegetation re-establishment); any available predisturbance information; locations, and content of existing reclamation material stockpiles; and whether soils have or have not been salvaged from the area, including current soil inspection information for this area, is to be used.

Some types of land disturbances that involve only minor surface disturbance do not need to be addressed by the predisturbance information *EPEA* approval condition unless directed by the AER. The following are examples of such exceptions:

- A single land disturbance requiring an area of less than one hectare (but several small disturbance areas may be considered a project that requires a PDA)
- Facilities requiring only vegetation removal
- Expansion or modification of existing roads, pipelines, or power lines within existing rights-of-way
- Test holes or pits for survey and investigation to determine location suitability (e.g., road alignments, water crossings, borrow pits, and facility siting)
- Minor soil disturbances near a building to provide access and limited parking space for the users of the building
- Soil disturbance for the purpose of environmental monitoring and assessment (e.g., air monitoring station or groundwater monitoring wells)
- Emergency response (e.g., grading for fire breaks, contaminant containments, monitoring wells for assessing failures)
- Soil disturbances with the objective of decreasing potential environmental impacts (e.g., groundwater remediation trench)
- Measures for mitigating potential impacts of facility operations on livestock or wildlife (e.g., fencing)

## 4.2 Submission of Predisturbance Assessment Information

The predisturbance assessment information must be collected before beginning construction. The methods used to collect the information are to be described with the data collected.

Predisturbance information for existing *EPEA*-approved projects must be submitted to the AER in the annual C&R report in accordance with this SED. Since the predisturbance information is used to develop the conservation and construction plan, excerpts from those plans that show how the predisturbance information was integrated into the conservation and construction plan can be enough to satisfy the predisturbance submission requirements in the annual C&R report.

For *EPEA* approvals that are issued after the release of this SED, predisturbance information is to be submitted with the annual conservation and reclamation report (refer to section 6) for the reporting year in which the disturbance occurred. For example, for all 2016 disturbances, the predisturbance information will be reported in the annual conservation and reclamation report submitted on or before March 31, 2017. Until the annual conservation and reclamation report is submitted to the AER, the predisturbance information must be available upon request by the regulator.

## 4.3 Predisturbance Assessment Mapping Requirements

### 4.3.1. Predisturbance Soil and Vegetation Map

Provide a map of the predisturbance soil, terrain, and ecosite information for site-specific disturbance. Provide anticipated topsoil and subsoil salvage depths, organic material depths, soil inspection locations, ecosite polygon mapping scale, legend, contours (1 m intervals), labelling of proposed disturbance areas (pipeline/powerline, well site, borrow pit location, etc.), north arrow, and legal subdivisions (LSDs). Mapping scale is 1:5000 or greater (e.g., 1:2500), depending on the size of the land disturbance. Scale refers to both mapping and presentation scale for predisturbance assessment information.

### 4.3.2. Predisturbance Topographic Map

A baseline map or airphoto or LiDAR imagery showing predisturbance topographic contours of 1 m or less for areas within and immediately adjacent to the proposed disturbance areas is required. Contours can be presented on the baseline soil map or on a separate map.

## 4.4 Data Collection Requirements

### 4.4.1. Soil Survey

The objective of a soil survey is to

- identify site suitability for construction;
- identify soils and their characteristics;

- identify the terrain types (e.g., upland, transitional, and wetland) within the proposed disturbance area to enable adequate conservation of reclamation materials and to inform a site-specific reclamation plan;
- guide soil conservation planning and field implementation, including minimization of disturbance in accordance with the terms and conditions of the *EPEA* approval;
- inform reclamation planning; and
- provide a baseline for determining reclamation success (i.e., equivalent land capability).

Soil survey inspections must be undertaken as follows:

- uniform area, homogeneous sites at least one inspection site/ha
- heterogeneous sites, including transitional areas with at least four inspection sites/ha

Note: all inspection sites are to have at least one inspection site for each mapped polygon (determined from the pre-typing and adjusted as the pre-typing polygons are ground-truthed) delineated in the predisturbance area. This could result in more survey inspection sites than the minimum requirement.

The survey inspection density requires more sample points on heterogeneous sites and fewer sample points on uniform lands and ensures that the average sampling density meets the specified polygon visitation requirement (e.g., minimum of one inspection for each mapped polygons).

In proposed linear rights-of-way, soil surveys are to be conducted at an average of one site per 100 m. One site per 100 m is an average soil survey density, and the actual spacing between sample sites can vary but should be decided considering each mapped polygon. Sample sites should be located along a linear development to adequately describe the variability of soil depths in both uniform and complex terrain. This linear development soil survey requirement applies to areas not covered by survey specifications indicated above.

Standard soil mapping protocol including pre-typing, ground truthing of the pre-typed polygons, and finalizing soil polygon delineation using field data must be followed. *The Soil Mapping System for Canada* (Expert Committee on Soil Survey 1981) defines the standard for soils mapping on this scale and provides further details about the procedures for preparing maps. Available provincial data (e.g., AVI) and project-specific data (bare-earth LiDAR, EIA soil maps, geotechnical borehole data, etc.) should be used to support the onsite data collection and for finalizing the soil map required as part of the predisturbance information submission. A soil map is required at 1:5000 or greater (e.g., 1:2500) (see section 4.3).

More soil survey work may be required to supplement the existing EIA and *EPEA* application and PLCRCP-level data as well as other regulatory applications in order to achieve the predisturbance soil survey densities specified above.

Information to be collected at each inspection location shall include, at a minimum, the following:

- Topsoil depth to its full thickness
- Subsoil depth up to 30 centimetres (cm) or more as needed to properly classify the soil profile
- Peat depth recorded to full depth for shallow peats of up to 40 cm and to at least 160 cm depth for deep peats
- Topsoil and subsoil texture (may be determined by field hand texturing)
- Terrain information (slope, landforms, type of parent material, drainage and moisture, and temperature regimes)

#### 4.4.2. Vegetation

Collected and described predisturbance vegetation information is used to characterize the available resources in order to plan merchantable and nonmerchantable timber salvage, seed collection (if applicable), and woody debris and soil salvage. The collection and description of predisturbance vegetation will provide information to support conservation and mitigation measures and reclamation planning and to identify a reference point for determining reclamation success (i.e., equivalent land capability).

During the EIA and *EPEA* applications and for other regulatory submissions, field surveys for vegetation data are completed. This includes mapping and characterizing vegetation polygons to ecosite phase, attributing rare plant potential rankings to each ecosite phase, and recording plant species observed within the ecosite phase found within the local study area.

As a result of the field surveys, vegetation communities, wetlands, rare plants, old growth forests, species at risk, and communities of limited distribution have been identified. During the *EPEA* application and approval process, any identified mitigation measures necessary to ensure responsible development, including commitments made by the company, are considered and must be incorporated into construction plans for the project. Project areas that contain provincial or federal species at risk requiring specific mitigation measures will have been identified, and that mitigation must be considered during site development.

Where project development is proposed outside of the local study area, additional field sampling is required that includes the field surveys for the EIA and *EPEA* applications and for other regulatory submissions that informed the associated *EPEA* approval. If field surveys within the local study area for the EIA, for *EPEA* applications, and for other regulatory submissions were completed, no further vegetation or rare plant surveying is required.

If additional field surveys are required, vegetation surveys must be conducted using established survey protocols where available. Where a rare-plant survey is to be undertaken, recognized rare-plant survey protocols are to be used, such as the *Alberta Native Plant Council (ANPC) Guidelines for Rare Vascular*

*Plant Surveys in Alberta* (2012) and other ANPC-recommended resources published in *Recommended Documents for Botanical Surveys in Areas of Proposed Disturbance* (2010).

When more vegetation surveys are required, sample locations should be established in representative areas of an ecosite phase (Beckingham and Archibald 1996); these areas are typically homogeneous in slope, soil type, plant cover, and overstory conditions. Information to be collected at each sample location should include, at a minimum, the following:

- Ecosite phase classification (as per Beckingham and Archibald 1996)
- Species list for dominant vascular and nonvascular species
- Identification of vegetation types or species that may require special consideration (this includes wetlands, rare plants, rare communities, and species at risk)
- Where applicable, occurrences of weed species as identified by the *Weed Control Act*, including plant cover, infestation level (i.e., density), and phenology

Wetland identification and classification is to consider relevant policy and guidelines, including the Alberta Wetland Policy, as amended.

The predisturbance vegetation information is to be captured in a vegetation map at a minimum map scale of 1:5000.

The conservation strategies, including avoidance and mitigation of vegetation communities, wetlands, rare plants, old-growth forests, species at risk, and communities of limited distribution, must be identified and integrated appropriately into the conservation and construction plan. Any description of proposed mitigation measures must include timing considerations and postmitigation monitoring plans. If this information has previously been provided and hasn't changed, please reference the location of the information (e.g., EIA, date, section X, page 2; or PLCRCP, date, section 3.2, page 10).



## 5 Conservation and Construction Plan

### 5.1 Context

A conservation and construction plan is critical to minimize disturbance and conserve the site during development and construction of the project. Conservation has to be deliberate and planned because once a site is disturbed, the opportunity to minimize disturbance is past; impacts can only be mitigated, not avoided. The conservation and construction plan must use the site-specific predisturbance information collected to develop recommendations for vegetation clearing, nonmerchantable timber salvage, soil salvage and storage, and reclamation along with other mitigations, such as avoiding protective features. The conservation and construction plan must integrate and reference site-specific constraints, avoidance, and commitments made within the EIA, *EPEA* application, and PLCRCP. It is important to accurately detail the construction methods and conservation plan to be employed at the proposed disturbance, including developing a detailed soil salvage plan. *EPEA* approval holders are responsible for preparing and following the conservation and construction plan and are required to report on both the plan and the results through the annual C&R report's postconstruction information (refer to section 6).

### 5.2 Submission of the Conservation and Construction Plan

The conservation and construction plan is to be developed before construction begins.

The results and details as it relates to the implementation of the conservation and construction plan are to be provided to the AER in accordance with this SED. For approvals issued after the release of the SED, the conservation and construction plan is to be reported on with the results through the annual C&R report submission for the reporting year in which the disturbance from the construction occurred. For example, all disturbances constructed in 2016, will be submitted in the annual C&R report (refer to section 6) submitted on or before March 31, 2017. Until the annual C&R report is submitted to the AER, the conservation and construction plan must be available upon request by the AER.

Excerpts from the conservation and construction plan can be utilized to fulfill the annual C&R reporting requirements as outlined in section 6. Please note, the AER does not require the submission of engineering work plans, construction plans, and packages. However, engineering work plans, construction plans, and packages must be retained for the life of any project and must be available upon request by the AER.

### 5.3 Conservation and Construction Plan Mapping Requirements

A map is to be prepared that indicates the planned soil storage locations (topsoil and subsoil stockpiles), soil stripping depths based on soil map units, area to be stripped or prepared for construction (for deep organic soil designated for no stripping, cut and fill must be indicated), and areas to be disturbed for construction. This map may be developed for the engineering work packages or construction packages. Use a mapping

scale of 1:5000 or greater (e.g., 1:2500), and include a legend of all features, line parameters, and north arrow (LSD not required).

#### 5.4 Conservation and Construction Plan Content Requirements

The following sections outline the specific information that is to be used and integrated into the development of a conservation and construction plan for the site being developed and disturbed. This plan may be or become part of the engineering work packages, construction plans, or packages or other documents that are developed by approval holders to support site construction.

##### 5.4.1. Predisturbance information

The site-specific predisturbance assessment information is to be used to develop the relevant construction planning documents that provide clear direction to a construction company on how site development and conservation is to occur.

##### 5.4.2. Construction Information

The construction information (engineering work plans, construction packages, and documents) must include an overview of the proposed construction techniques (e.g., clearing, grubbing, grading, and soil salvage), including a description of areas requiring geotextile or off-site fill materials (e.g., pH, salinity, sodicity), and a discussion of any constraints and how such constraints will be managed during construction. The construction information must be illustrated on a drawing, map, or air photo.

The construction information is to be retained by industry for potential audit or review and is to be available to the AER upon request. Results of the construction activities and information will be provided as part of the postconstruction information required and submitted with the annual C&R report. The AER may undertake site inspections during construction to assess whether construction plans are executed according to site-specific conservation and construction plans to ensure compliance with operating approvals.

Construction information must also identify and address any proposed methods for mitigating impacts on environmentally sensitive sites within or beside the planned area of disturbance, including identified rare-plant locations and wetlands.

The construction information must address the requirement that before initial entry onto public land, the AER is to be notified as outlined in the *Public Lands Act* approval.

### 5.4.3. Woody Material Management

The conservation and construction plan must also identify site-specific plans for handling nonmerchantable timber and woody material, including

- a description of species composition,
- the approximate volume of woody material,
- how the material will be cleared, and
- how the material will be managed (e.g., mulched, retained for reclamation or erosion control, or disposed of; Alberta Environment and Parks external directive *ID 2009-01* must be consulted).

### 5.4.4. Soil Salvage Information

Soil salvage is a critical part of the conservation and construction plan. It must address the salvage of both topsoil and subsoil and must be developed from the predisturbance soil information and include the following:

- Estimated soil salvage volumes that are calculated based on recorded soil depths across the site for
  - salvageable topsoil, and
  - salvageable subsoil (where applicable).
- Proposed stockpile storage locations and signage (topsoil and subsoil—illustrated on a map or air photo)
- Estimated volumes of reclamation material that will need to be stockpiled off site or at a central stockpile
- Consideration of soil conditions that may require special consideration or handling techniques and a proposed mitigation approach
- Identification of the soils in any previously disturbed areas, and strategies for addressing soil salvage in these areas

During construction, a qualified individual is to be on site during soil salvage (refer to appendix 2). The qualified individual is not required if construction is in a deep peat area. Alternatively, someone with more than 10 years of documented experience in the surface construction industry in Alberta can be on site during soil salvage as long as those 10 years of experience relate to the requirements of a qualified individual with the exception of a professional designation.

The approval holder is to document and maintain a record of the qualified individual and the results of the work completed. This information is to be retained for the AER's audit or review and is to be provided to the AER upon request.

## 6 Annual Conservation and Reclamation Report

### 6.1 Context

The annual C&R report standardizes the annual collection and reporting of predisturbance assessment information, conservation and construction information, and postconstruction details, including soil segregation approach and quantity salvaged, soil storage, annual and cumulative disturbance areas, and land reclamation accounting and monitoring as defined in the *EPEA* approval for commercial in situ oil sands facilities for the AER. This information supports the AER in determining compliance with operating terms and conditions and validation of the commitments that were made during the planning stages of the in situ oil sands facilities.

The annual C&R report allows for current- and following-year reporting on the progress of construction and reclamation that shows alignment with strategies and outcomes in the PLCRCP.

### 6.2 Submission of Annual Conservation and Reclamation Report

An annual C&R report is only required if there has been construction or land reclamation activities subject to an *EPEA* approval in the reporting year or proposed for the following year. If there is no reportable construction or land reclamation in the reporting year or proposed for the following year, a letter is to be submitted to the AER before the annual report deadline explaining that no construction or land reclamation has occurred or is planned.

Submission of the annual C&R report will include data, information, and results from the predisturbance assessment and conservation and construction plan in addition to the annual C&R reporting information. Stand-alone appendices for the predisturbance information and postconstruction information can be submitted for the project or for individual project components or disposition-type activities where applicable. Annual C&R report submissions must follow the main headings of the requirements outlined below. Subheadings can be modified based on the project-specific reporting requirements as outlined in an *EPEA* approval.

The reporting year for each annual C&R report is from January 1 to December 31.

Annual C&R reports are to be submitted electronically to [EPEA.Reports@aer.ca](mailto:EPEA.Reports@ aer.ca) on or before March 31 of each reporting year. The electronic format must be PDF/A, with search and copy capabilities.

Ensure that the cumulative construction, operation, and land reclamation area data are consistent with totals submitted in previous annual C&R reports. Explain any deviations.

### 6.3 Annual Conservation and Reclamation Mapping and Figure Requirements

Provide figures, including maps, diagrams, and photographs that support the required tables in the annual C&R report. Ensure that figure labels for a given project component are consistent with the name of the

project and components in the tables and text. Choose an appropriate map scale, unless otherwise indicated, to show all relevant project components with an adequate level of detail.

### 6.3.1. Overview Map

Provide a figure (figure 1) of the project location showing overall landscape and terrain, proximity to other developments and overall area features (lakes, etc.), north arrow, and LSDs. The figure is to show the project location in relation to major anthropogenic and natural features, including highways, waterbodies (including lakes & streams), and municipalities.

### 6.3.2. Project Location Maps and Figures

The following are the project locations and detailed maps and figures that are to be included with the annual C&R report:

1) Project area, and areas altered during the reporting year (figure 2)

Provide a figure showing the project area with all facilities related to the project labelled. Highlight areas that were altered during the reporting year.

2) Overview of construction, operation, and land reclamation activities for <reporting year> (figure 3)

Provide a figure showing the extent of construction, operation, or land reclamation activities by project component or disposition-type activity for the reporting year.

3) Cumulative land status for the project area (figure 4)

Provide a figure of the cumulative construction, operation, remediation, and permanent reclamation activities for the project.

4) Overview of construction, operation, and land reclamation activities for <following year> (figure 5)

Provide a figure showing an overview of the proposed construction, operational and land reclamation activities for the following year.

### 6.3.3. Predisturbance and Postconstruction Maps and Figures

The predisturbance and postconstruction information is to be identified in maps and figures for each project component or disposition-type activity acted on in the reporting year, including the following:

1) Predisturbance vegetation map at a 1:5000 scale (figure 6)

2) Predisturbance topographic map (figure 7)

3) Preconstruction soil salvage drawing (figure 8)

4) As-constructed drawing (figure 9), which must include

- georeferenced location of image,
- aerial extent of area cleared,
- aerial extent of area stripped,
- soil stockpile locations, and
- soil stockpile volumes.

#### 6.4 Annual C&R Report Content

The content required, including tables, for each section of the annual C&R report is presented in the sections below. The required maps and figures are outlined in section 6.3. The entries for each table have been provided as an example only.

##### 6.4.1. Project Description

Identify the project and the project approval number and discuss the current status of development.

Summarize new developments that occurred in the reporting year and report any deviations from planned activities in previous submissions to the AER (e.g., predisturbance assessment information, conservation and construction plans, previous annual C&R reports, and monitoring proposals).

##### 6.4.2. Regulatory Update

###### 6.4.2.1. *Environmental Protection and Enhancement Act* Approval and/or Amendments

Provide a summary of any approvals or amendments related to conservation and land reclamation.

Identify any applications that are currently in the regulatory process.

###### 6.4.2.2. Special Reports

Provide a list of all conservation, land reclamation, wildlife, wetland, and monitoring reports that are required in the *EPEA* approval as amended (see table 4) (not including air, industrial wastewater and runoff, groundwater or soils monitoring, or management reports). Include the due dates and status of the reports in the table. The following are terms used to define the special report status are:

- Not due yet
- Submitted to the regulator
- Supplemental information requests issued and responses provided
- Authorized
- Implemented

**Table 4. Special reports summary\***

<b>EPEA requirement</b>	<b>Report name</b>	<b>Due date</b>	<b>Status/date</b>
3.8.3	Wetland reclamation trial program	April 30, 2010	Submitted to the AER mm/dd/yy
4.7.3	Reclamation monitoring program	November 30, 2011	Submitted to the AER mm/dd/yy
	PLCRCP	June 30, 2017	Not due yet

\* Table entries provided as an example

#### 6.4.2.3. PLCRCP Status Update

In the EIA, *EPEA* application, PLCRCP, and other regulatory documents, approval holders develop the in situ project considering the constraints, commitments, and planned mitigation required by regulatory plans related to conservation, reclamation, and closure.

Construction/operation and reclamation activities completed in the reporting year are to align with the PLCRCP.

For sites or activities that were constructed or undertaken in the reporting year, provide a summary of the constraints, commitments, and planned mitigation identified in the PLCRCP that were made related to conservation, reclamation, and closure (see table 5). Describe the status or result of the constraints, commitments, and planned mitigation, and if varied, describe how the overall intent of the constraints, commitments, and planned mitigation was achieved.

**Table 5. Site and activity-specific conservation, reclamation, and closure commitments\***

<b>Disposition number and/or project component</b>	<b>Commitment/constraint/mitigation</b>	<b>Description</b>	<b>Status/result of commitment</b>	<b>Source of commitment</b>
MSL 123456 Plant site	Retention of old-growth forests	Only 10% of the old-growth forest will be impacted	2% of old-growth forest disturbed during site construction	EIA, SIR 1, Pg 30

\* Table entries provided as an example

#### 6.4.3. Summary of Land Status

Areas within the project must be classified based on the status of the activity on the land in one of the following categories (see appendix 2 glossary for definitions):

- construction (cleared or disturbed),
- operation (active operation, inactive operation, or temporary reclamation),
- undergoing remediation,
- ready for reclamation,

- permanent reclamation activities (pad materials removed, recontoured, soil placed, revegetated, and wetland reclamation trial), or
- reclaimed (permanently reclaimed or certified).

The purpose of applying classifications is to understand construction activities at the site, to track project components that are no longer in use, and to monitor progressive reclamation. Summarizing the status of land in tables (see tables 6 & 7 below) and linking this information to maps showing the location of the activity will help establish a planned cumulative monitoring system for in situ oil sands disturbances. Electronic submission of maps using geographic information systems (GISs) could potentially be a future requirement.

#### 6.4.3.1. <Reporting Year> Activities

Summarize the areal extent of construction, operation, or land reclamation activities by project component or disposition-type activity for the reporting year in table 6. Specific areas (e.g., well pad B) should be discussed and shown on figure 3. Provide a total for each status category (construction, operation, undergoing remediation, ready for reclamation, permanent reclamation activities, and reclaimed and their subcategories), including all facilities listed. Refer to the glossary (appendix 2) for definitions.

Include a summary of any decommissioning activities that may have occurred over the reporting year.

#### 6.4.3.2. Cumulative Activities

Provide a brief description and a figure (figure 4) of the construction, operation, remediation, and permanent reclamation activities for the project.

Summarize the areal extent of construction activities by project component in table 7. Specific areas within each project facility (e.g., well pad B) should be discussed and shown on figure 3. Provide a cumulative area total for each status category (i.e., construction, operation, remediated, ready for reclamation, permanent reclamation activities, and reclaimed, and their subcategories), including all facilities listed, ensuring that any piece of land has only one status. For example, the total permanent land reclamation category includes the total spatial footprint that meets the definition of permanent land reclamation at the end of the reporting period.

Wetland reclamation trial area only needs reporting if there is an area within the project that is undergoing a trial under an *EPEA* approval requirement. The purpose of tracking this is to track any area that may not be undergoing reclamation in accordance with the *EPEA* approval conditions and that may require special consideration at certification.

Provide a discussion about applying for a reclamation certificate for each specific area identified as permanently reclaimed.



The reporting period must capture all cumulative construction, operation, and land reclamation activities that occurred for the entire project from the start of development.

Include a summary of any decommissioning activities that occurred over the life of the project.

**Table 6. Summary of <reporting year> activities in hectares<sup>1</sup>**

Project facility <sup>2</sup> / disposition	Construction			Operation				Undergoing remediation	Ready for reclamation
	Cleared	Disturbed	Total area under construction	Active operation	Inactive operation	Temporary reclamation	Total area operational		
<b>Pad B MSL 23456</b>									
<b>Pad C</b>	1	3	4						
<b>Borrow pit 1</b>				2			2		
<b>Total</b>	1	3	4	2	0	0	2	0	0

Project facility/ disposition	Permanent reclamation activities						Reclaimed	
	Pad materials removed <sup>4</sup>	Recontoured	Soils placed	Revegetated	Wetland reclamation trial area <sup>3</sup>	Total area undergoing reclamation	Permanently reclaimed	Area certified
<b>Pad B MSL 23456</b>					3			
<b>Pad C</b>								
<b>Borrow pit 1</b>			2					
<b>Total<sup>3</sup></b>	0	0	2	0	3	0	0	0

1 Refer to glossary for the definition of land status. Status must be reported by December 31.

2 The total from table 6 should be included in the cumulative total from table 7.

3 Reporting area is only necessary if there is a wetland reclamation trial program on site.

4 Intended to capture areas constructed in deep or shallow organics.

\* Table entries are provided as an example. All *EPEA* approved footprint areas must be reported in this table for the reporting year and not reported under more than one column.

**Table 7. Cumulative summary of construction, operation, and land reclamation activities in hectares\*<sup>1</sup>**

Project facility <sup>2</sup> / disposition	Construction			Operation			Undergoing remediation	Ready for reclamation
	Cleared	Disturbed	Total area under construction	Active operation	Inactive operation	Temporary reclamation		
Plant site MSL 12345				30		10	40	
Pad A MSL 34567								
Pad B MSL 23456							3	
Pad C	1	3	4					
Borrow pit 1				2			2	
Road					10	5	15	
Pipeline								
<b>Cumulative total</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>32</b>	<b>10</b>	<b>15</b>	<b>60</b>	<b>0</b>

Project facility/ disposition	Permanent reclamation activities						Reclaimed	
	Pad materials removed	Recontoured	Soils placed	Revegetated	Wetland reclamation trial area <sup>4</sup>	Total area undergoing reclamation	Permanently reclaimed	Area certified
Plant site MSL 12345								
Pad A MSL 34567							3	
Pad B MSL 23456								
Pad C								
Borrow pit 1			2			2		
Road								
Pipeline				8		8		
<b>Cumulative total<sup>3</sup></b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>8</b>	<b>3</b>	<b>10</b>	<b>3</b>	<b>0</b>

<sup>1</sup> Refer to glossary for the definition of land status. Status must be reported by December 31.

<sup>2</sup> Previous to reporting year (all areas of the EPEA-approved footprint must be listed and not reported under more than one column).

<sup>3</sup> Cumulative total (must represent all land status related to the EPEA-approved footprint).

<sup>4</sup> Reporting areas is only necessary if there is a Wetland Reclamation Trial Program on site.

\* Table entries are provided as an example.

#### 6.4.3.3. <Following Year> Activities

Provide a general description of the construction, operation, and land reclamation activities that are planned to be altered or started in the following year, and identify the anticipated status of the land. Provide a figure (figure 5) showing an overview of the proposed construction, operation, and land reclamation activities for the following year.

#### 6.4.4. Predisturbance Assessment Information

For sites constructed in the reporting year, provide the predisturbance assessment information collected. This submission can be an excerpt from the conservation and construction plans where predisturbance information was appropriately integrated. A predisturbance vegetation map (figure 6), predisturbance topographic map (figure 7), and preconstruction soil salvage drawing (figure 8) are to be included. These figures could be provided for the project or for each project component or disposition-type activity as applicable. The predisturbance information must be provided in a standalone appendix at the end of the annual C&R report. The PDA information is to be provided based on the criteria outlined in section 4.

#### 6.4.5. Postconstruction Information

Construction activities commence after the predisturbance information has been used to develop appropriate conservation and construction plans. The conservation and construction plan contains details about how the site was developed, and the postconstruction information is to provide the results of that construction. Specifically, was the construction undertaken according to the plans? If not, provide, in the annual C&R report, details on how the plans were adjusted to ensure alignment with the intent of the plan and the requirements of the *EPEA* approval.

The postconstruction information must be provided in a stand-alone appendix at the end of the annual report. For example, for all disturbances made in 2016, the postconstruction information will be included in the annual C&R report submitted on or before March 31, 2017. The postconstruction information can be provided in the report appendix consolidated for the project or individually for each project component or disposition-type activity.

The postconstruction information can be provided in paragraph, table, or figure format (or any combination). Table 8 is provided as an example table. Where appropriate, explanation of the table or drawing content is to be provided in the comments column of the table or as additional text. This includes clarification on the construction (planned) and the postconstruction (actual) soil volumes. The postconstruction information must also include the as-constructed drawing (figure 9).

The postconstruction information for the reporting year is to identify and explain the following:

- The construction activities and the site conditions that construction was completed in
- When construction occurred for each project component and disposition-type activity that required significant soil disturbance (e.g., well site, access roads and corridors, central processing facilities)
- The location, dimensions, and area (in hectares) of the final disturbance footprint
- The final material salvaged for topsoil, subsoil, and organics (if salvaged and stockpiled separately from the mineral topsoil). Reported salvaged volumes should be based on stockpile sizes, or load counts, or both.
- The final locations and dimensions of the salvaged topsoil and subsoil stockpiles for the project components and disposition-type activities, including as constructed drawings (figure 9)
- The source and characteristics of the materials included in the topsoil and subsoil stockpiles
- Reclamation material balance (comparison of proposed to actual, explanation of mitigation proposed if any potential shortfalls or excess material):
  - Information provided on the reclamation material balance is to be integrated into the PLCRCP to demonstrate that project conservation and reclamation outcomes are on target.
- Merchantable timber and salvage operations, including timber volumes: nonmerchantable timber and woody debris management, including how the nonmerchantable timber and woody debris was handled, how it was disposed of or treated (e.g., mulched, burned, etc.), and whether any issues were encountered. If the material was mulched, identify the approximate size range of the mulched pieces and indicate how the mulch material was handled in relation to the topsoil salvage plan for the site.
- Sensitive-species mitigation (rare plants, wetlands and SAR) used, where applicable
- Weed control measures applied during construction, where applicable

**Table 8. Sample postconstruction summary of activities constructed in the reporting year**

Project component	Well pad 1	Well pad 2	Main access road	Comments
Legal land location	05&06-09-077-05 W4M	13&14-09-077-05 W4M	05, 06, 13&14-09-077-05 W4M	
Disposition number	MSL123456	MSL123457	LOC000112	
Start date <sup>1</sup>	October 1, 2015	October 1, 2015	October 1, 2015	
Disturbance area	4.7 ha	4.1 ha	7.0 ha	
Merchantable timber	10 000 m <sup>3</sup>	N/A	N/A	
Nonmerchantable timber	Mulched, excess burned	Salvaged, mulched, burned	Salvaged, mulched, burned	
Woody material	Placed on subsoil pile	N/A	N/A	
Soil sample points <sup>2</sup>	7	10	7	
Predisturbance topsoil volume (estimate)	1000 m <sup>3</sup>	N/A	1500 m <sup>3</sup>	
Predisturbance subsoil volume (estimate)	1000 m <sup>3</sup>	N/A	N/A	
Topsoil <sup>3</sup> salvage Volumes	1000 m <sup>3</sup> (figure 8)	N/A	2000 m <sup>3</sup> (Figure 8a)	
Subsoil salvage volumes	1300 m <sup>3</sup> (figure 8)	N/A	N/A	
Shallow or deep organic	N/A	N/A	N/A	
Total volume salvaged	2300 m <sup>3</sup> (figure 8)			
Stockpile area <sup>4</sup>	0.7 ha (figure 8) <sup>3</sup>	N/A (as-built 2a)	Windrow along ditch (figure 8a)	

1 Start date references the start of soil disturbance.

2 Soil sample points are to be linked to predisturbance assessment information and figures.

3 Definition of topsoil in approval includes organics; however, organics should be reported in the “shallow or deep organics” column unless it was salvaged with the topsoil.

4 Stockpile areas are to be linked to table 9 and figure 9.

## 6.4.6. Materials Handling

### 6.4.6.1. Soil Stockpile Summary

Provide a figure, if not already submitted at an appropriate scale in figure 5 or 9, showing the location of all stockpiles in the project facilities. Use a consistent numbering or naming sequence from year to year. Complete table 9, including a list of management measures used for the stockpile (e.g., packed, graded, seeded, weed control, erosion control, or natural regeneration). Provide a discussion on any stockpiles that have been moved, and identify the stockpile that was moved in the comments section of table 9.

The following are terms used to define the soil stockpile status of vegetation cover:

- Bare (<30% cover)
- Partial (30–70% cover)
- Full (>70% cover)

**Table 9. Soil stockpile summary for the project\***

Stockpile number/name <sup>1</sup>	Year created	Stockpile location (legal land location / GPS coordinates & description)	Source areas	Stockpile footprint (ha)	Source material (mineral topsoil, subsoil, organics)	Volume (m <sup>3</sup> ) <sup>2</sup>			Comments and status of vegetation cover
						Previous to reporting year	Reporting year	Cumulative	
1	2000	S edge CPF	CPF	2	Topsoil	13 500	0	13 500	Packed and seeded – bare

1 As labelled on corresponding figure

2 Volumes must be reported in BCM

\* Table entries provided as an example

#### 6.4.6.2. Soil Placement

Summarize in table 10 the placement of soil for use in temporary or permanent reclamation. Indicate the source of the soil (e.g., stockpile, access right-of-way, direct-placement source area, or borrow area).

**Table 10. Soil placement summary for <reporting year>\***

Source <sup>1</sup>	Location of soil placement	Area of soil placement (ha)	Volume of soil placed (m <sup>3</sup> )		Estimated average depth of soil placement (m)		Target replacement depth* as referenced in PLCRCP (m)	
			Topsoil <sup>2</sup>	Subsoil	Topsoil <sup>2</sup>	Subsoil	Topsoil	Subsoil
Stockpile 1	Borrow pit 1	2	3000	9000	0.15	0.30	0.15	0.30

1 Source options are: 1) stockpile (provide name/number) or access road; 2) direct placement source site (provide legal land location); 3) borrow area (provide name/number)

2 Topsoil includes both mineral and organic.

\* Table entries provided as an example

### 6.4.6.3. Revegetation

#### 6.4.6.3.1. Revegetation Activities for <Reporting Year>

Provide a description of the reporting year revegetation activities using table 11 for permanent reclamation. Include any proposed changes to the land reclamation seed mix. For each project component and disposition-type activity that varied from the PLCRCP revegetation strategy, describe how the overall intent of the revegetation strategy was achieved.

**Table 11. Revegetation activities for <reporting year>\***

Project component / disposition-type activity	Target ecosite <sup>1</sup>	Revegetation activity for reporting year	Planting and seeding procedure <sup>2</sup>	Fertilization procedure <sup>3</sup>	Maintenance program <sup>4</sup>	Total area (ha)	Comments <sup>5</sup>
Pipeline	d1	Trees	Aspen @315 st/ha	–	–	0	
		Shrubs	Prickly rose @200 st/ha	25 kg N/ha	Application of herbicide for first year	3	
		Seed mixes	ASRD-approved Central Mixedwood blend	40 kg N/ha	Application of herbicide for first year	5	
Total area revegetated <sup>6</sup>						8	

1 A project component may have more than one target ecosite. Each ecosite should be represented in a separate row. Revegetation activities could be reported to the ecosite phase if appropriate.

2 Seed application rates, methods, and mixtures; source, quality, methods, composition, and stocking rates of trees and shrubs.

3 Mixtures, timing, rates, and strategy of fertilization.

4 Seeding, fertilization and application of herbicides, pesticides, and soil sterilants.

5 Comments can include infill planting, infestation, browsed, etc.

6 Total area revegetated must equal the total in the “revegetated” column for table 6.

\* Table entries are provided as an example.

#### 6.4.6.3.2. Cumulative Revegetation Summary

Provide a description of the cumulative revegetation activities for permanent land reclamation using table 12.

**Table 12. Cumulative revegetation activities**

Project component <sup>1</sup> / disposition-type activity	Target ecosite <sup>2</sup>	Revegetation activity for reporting year	Planting and seeding procedure <sup>3</sup>	Total area (ha)	Comments <sup>4</sup>
Pipeline	d1	Trees	Aspen @315 st/ha	0	
		Shrubs	Prickly rose @200 st/ha	3	Revegetation is successful.
		Seed mixes	ASRD-approved Central Mixedwood blend	5	Revegetation is successful.
Total area revegetated <sup>5</sup>				8	

1 All project components within the EPEA Approved Footprint that have had permanent revegetation activities should be listed.

2 A project component may have more than one target ecosite. Each ecosite should be represented in a separate row. Revegetation activities could be reported to the ecosite phase if appropriate.

3 Seed application rates, methods, and mixtures; source, quality, methods, composition and stocking rates of trees and shrubs.

4 Comments can include major issues such as infill planting, infestation, browsed, etc.

5 Total Area Revegetated must equal the total in the 'revegetated' column for table 7.

\* Table entries provided as an example

#### 6.4.7. Permanent Reclamation Summary

Identify in table 13 the project components that meet the definition of permanent reclamation and that are part of the project. This area should be identified in table 7 as part of the cumulative total for area reclaimed. Do not include in this table any areas that have been certified. Provide a discussion about applying for a reclamation certificate for each specific area.

This information must be integrated with the PLCRCP when updates are submitted to the AER.

**Table 13. Summary of permanent land reclamation\***

Project component and/or disposition number	Year reclaimed	Status/comments	Total hectares permanently reclaimed
Well pad A	2007	Applied for Rec Cert in 2008	3
Cumulative total <sup>1</sup>			3

1 The cumulative total from table 10 must match the cumulative total for "Permanent Reclamation" in table 7.

\* Table entries are provided as an example.



#### 6.4.8. Research and Monitoring

Provide a summary of activities related to research, monitoring, and mitigation programs specified by the approval or by other programs the approval holder is conducting or involved in, including weed management, wildlife, wetland reclamation trial programs, erosion control, revegetation, reclamation monitoring, rare-plant monitoring, etc. Include the following in the discussion:

- a description of the program
- any findings of the program
- adaptive management—how are the research and monitoring results being incorporated into construction, operation, and land reclamation?
- A summary (in table 14) of any rare-plant mitigation or required further monitoring that was conducted based on known constraints outlined in an EIA, and a summary of any monitoring conducted according to submitted predisturbance assessment information.

**Table 14. Rare plant information for <reporting year>\***

Species	Common name	Legal land description <sup>1</sup>	Location description	Initial population #	SRank status <sup>2</sup>	Reason for monitoring	Monitoring year	Outcome	General health	Comment
Sphagnum Fallax	Peat moss	LSD-SEC-TWP-RGE-WXM	Near pad A1	3 groups of 10–15 plants	SX	Experimental	X	Three populations seen	Transplant looked healthy	Species was transplanted, potential for secondary impacts

<sup>1</sup> Provide the legal land location of the transplant site, if applicable.

<sup>2</sup> From the Alberta Natural Heritage Information Centre's vascular and non-vascular plant tracking and watch lists.

\* Table entries are provided as an example.

## 7 Literature Cited

Alberta Environment. 2009. *Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region*. Prepared by Terrestrial Subgroup Cumulative Environmental Management Association. <http://environment.gov.ab.ca/info/library/8269.pdf>.

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Alberta Native Plant Council (ANPC), *Guidelines for Rare Vascular Plant Surveys in Alberta*. 2012. <http://anpc.ab.ca/wp-content/uploads/2015/01/Guidelines-For-Rare-Plant-Surveys-in-AB-2012-Update.pdf> and ANPC recommended resources published in *Recommended Documents for Botanical Surveys in Areas of Proposed Disturbance* (2010). [http://anpc.ab.ca/wp-content/uploads/2015/01/ANPC\\_Recommendations4BotanicalSurveys\\_Mar2009.pdf](http://anpc.ab.ca/wp-content/uploads/2015/01/ANPC_Recommendations4BotanicalSurveys_Mar2009.pdf)

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Expert Committee on Soil Survey. 1981. *A Soil Mapping System for Canada: Revised*. Land Resource Research Institute Contribution No. 142. Ottawa: Research Branch, Agriculture Canada. <http://sis.agr.gc.ca/cansis/publications/manuals/1981-smsc/index.html>

Government of Alberta. 2013. Alberta Wetland Policy. <http://aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandPolicy-Sep2013.pdf>

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Pedocan Land Evaluation Ltd. 1993. *Soil Series Information for Reclamation Planning in Alberta*. Prepared for Alberta Conservation & Reclamation Council. Report No. RRTAC 93-7

Soil Classification Working Group. 1998. *The Canadian System of Soil Classification* (3rd edition). Ottawa: Agriculture and Agri-Food Canada. [http://sis.agr.gc.ca/cansis/publications/manuals/1998-cssc-ed3/cssc3\\_manual.pdf](http://sis.agr.gc.ca/cansis/publications/manuals/1998-cssc-ed3/cssc3_manual.pdf).

Wall, G.J., D.R. Coote, E.A. Pringle and I.J. Shelton (editors). 2002 *RUSLEFAC – Revised Universal Soil Loss Equation for Application in Canada: A Handbook for Estimating Soil Loss from Water Erosion in Canada*. Ottawa Contribution No. 02-92. Ottawa: Research Branch, Agriculture and Agri-Food Canada. <http://sis.agr.gc.ca/cansis/publications/manuals/2002-92/rusle-can.pdf>.

## Appendix 1 Abbreviations

ACIMS	Alberta Conservation Information Management System
AER	Alberta Energy Regulator / regulator
A&RP	Approvals and Registrations Procedure Regulations
AVI	Alberta Vegetation Inventory
AWI	Alberta Wetlands Inventory
CCR	Conceptual Conservation and Reclamation Plan
CRR	Conservation and Reclamation Regulation
C&R	conservation and reclamation
EA	environmental assessment
EIA	environmental impact assessment
<i>EPEA</i>	<i>Environmental Protection and Enhancement Act</i>
CRCMA	conservation, reclamation, and closure management area
GIS	Geographic Information Systems
MC	mitigation conservation
MR	mitigation reclamation
<i>OSCA</i>	<i>Oil Sands Conservation Act</i>
PDA	predisturbance assessment
PDA / C&R Plan	predisturbance assessment / conservation and reclamation plan
<i>PLA</i>	<i>Public Lands Act</i>
PLCRCP	Project-level conservation, reclamation, and closure plan
SED	Specified enactment direction

## Appendix 2 Glossary

Terms not defined in this glossary can be found in the *EPEA* approval.

Active operation	Any land that has been cleared or disturbed by the approval holder in any manner associated with the activity being conducted subject to the <i>EPEA</i> approval which supports production and project activities.
Certified	Areas that have received a reclamation certificate under <i>EPEA</i> . These areas are not counted in the total active footprint calculation because they are no longer considered active (they have been returned to the Crown).
Cleared	Areas in which vegetation has been removed for the purposes of preparing the land for soil removal or cut/fill activities but the soil has been left intact and relatively undisturbed. May include any or all of tree removal, shrub removal, and grubbing (stump removal). It is possible that land can move directly to the “disturbed” category and bypass the “cleared” category if the activities occur within the same reporting period, or if the land did not require clearing.
Commercial in situ oil sands facility	Commercial in situ oil sands facility means a facility producing more than 2000 cubic metres per day.
Conservation, reclamation, and closure management area (CRCMA)	Geographic areas within the defined boundary of the PLCRCP, based on environmental landscape features or considerations related specifically to conservation, reclamation, and closure planning and management. The CRCMA may be composed of one or more ecosites and/or ecosite phases and/or wetland classes. Since the management areas are based on biophysical similarities to develop strategies for C&R management, one CRCMA may have several locations within the Project as the locations that form the specific CRCMA do not need to be beside each other.
Construction	Areas that are undergoing clearing or disturbance, which includes the act of removing vegetation and salvaging topsoil or subsoil.
Direct placement	Areas in which mineral or organic topsoil has been directly placed (not placed from stockpile) to act as a propagule source for revegetation as well as a (soil) reclamation material.
Disturbed	Areas in which, at a minimum, soil has been removed or covered by other materials and where soil may be required for land reclamation purposes. This category includes material storage areas.
<i>EPEA</i>	Alberta <i>Environmental Protection and Enhancement Act</i> (Government of Alberta, 2000), as amended.
<i>EPEA</i> approved footprint	The total area approved under the <i>EPEA</i> approval issued by the regulator. This category is not applied to individual structures.

Heterogeneous area	An area composed of more than one soil map unit and varying topographic features observed close to each other (e.g., the area transitions from an upland feature to a wetland feature and upland areas with dissected microtopographic features).
Inactive operation	Any land disturbed by the approval holder in any manner associated with project activities during operations, which are the subject of the approval, where the land is not ready for reclamation and is not actively being used to support production and project activities.
Local study area	Is the area surrounding and including all lands subject to direct disturbance from the project and associated infrastructure, where there is a reasonable potential for immediate environmental impacts due to ongoing project activities.
Mapping scale	Refers to the level of detail that an area is mapped in and must be large enough to provide the detail related to the data being represented on the map. Mapping scale, including the amount of detail of features represented, is dependent on what is needed to be adequately represented and how the maps will be used (the purpose of the map).
Permanent reclamation	Land is considered permanently reclaimed when contouring, soil placement, and revegetation has taken place. Land cannot be listed under permanent reclamation until revegetation has occurred that is in accordance with the approved reclamation and revegetation plans.
Permanent reclamation activities	Include activities that support permanent land reclamation, such as removal of pad materials, recontouring, soil placement and revegetation, and wetland reclamation trial areas.
Presentation or publishing map scale	The scale will differ from site to site depending on the size of the area and on the data being presented on a specific map. The presentation scale and information being shown are not linked to the mapping scale of the data/detail being represented.
Project component	A specific activity, facility, or piece of infrastructure that supports the project. The EPEA approval holder may hold a disposition, issued under the <i>Public Lands Act</i> for the specific activity.
Project-level conservation, reclamation, and closure plan	A tool for evaluating the alignment of site-specific conservation and reclamation activities with the project-level goals.
PLCRCP boundary	Includes all of the infrastructure, facilities, or land that is being used or has been used or held for or in connection with or will be used for the production of bitumen or heavy oil, such as the central processing facility, well pads, borrow pits, and corridors, including disposal pipelines and wells and is to be consistent with other <i>EPEA</i> approval terms and conditions.
Qualified individual	Defined as having <ul style="list-style-type: none"> <li>• authority to give direction and orders to onsite staff during construction;</li> </ul>

- experience or education in earth, biological, or environmental sciences or related fields;
- experience working in the boreal region of Alberta and experience or education in that biophysical setting;
- experience or education in land conservation and reclamation or related fields;
- knowledge and understanding of Alberta legislation as it applies to public and private land;
- knowledge and understanding of Alberta policies, land-use planning documents, and guidelines; and
- a related professional designation or experience working under the direct supervision of an individual with a professional designation. The professional must be a member in good standing of one of the following seven professional regulatory organizations:
  - Alberta Institute of Agrologists
  - Alberta Society of Professional Biologists
  - Association of Professional Engineers and Geoscientists of Alberta
  - Association of Science and Engineering Technology Professionals of Alberta
  - Association of the Chemical Profession of Alberta
  - College of Alberta Professional Foresters
  - College of Alberta Professional Forest Technologists

Rare plant	Refers to species that exist in low numbers, have a restricted range, or are of conservation concern due to population trends or threats (Kemper 2009) and are included on the current ACIMS list of all tracked and watched elements.
Ready for reclamation	Areas that are no longer required for project activities and that are available for reclamation but where reclamation activities have not yet begun.
Recontouring	Any activity related to the movement of soil parent material during land reclamation for the purpose of creating a landscaped surface that will blend into the surrounding landscape. This may include some areas where subsoil has been placed.
Regulatory plans	Regulatory plans can include wildlife and caribou monitoring and mitigation plans, wetland monitoring plans, wetland reclamation trials, reclamation monitoring plans, EIAs, PDA/C&R plans before April 2016, annual C&R reports and any relevant goals/limits identified in a regional plan under the land-use framework, and federal/provincial species recovery plans.
Remediation	Any activity related to the management or removal of contaminated soil, groundwater, or vegetation.

Revegetation	Any activity related to growing vegetation in areas being permanently reclaimed (including seeding, tree and shrub planting).
Shrubs planted	Areas in which shrubs have been planted in accordance with the approved land reclamation and revegetation plans.
Soil placement	Any activity related to the placement of organic material, subsoil, and topsoil onto the recontoured landscape in accordance with approved Conservation and Reclamation soil placement plans.
Species at risk	Means any species (i) identified by the <i>Alberta Wildlife Act</i> as “Endangered” or “Threatened,” (ii) listed in <i>The General Status of Alberta Wild Species</i> as “At Risk,” “May Be At Risk,” or “Sensitive,” (iii) classified as “at risk” by the Committee on the Status of Endangered Wildlife in Canada, or (iv) listed under schedule 1 of the <i>Canadian Species at Risk Act</i> ;
Stockpile	Storage area for salvaged reclamation materials (e.g., mineral topsoil, subsoil, organic material, woody debris).
Temporary reclamation	Areas being managed where topsoil has been placed and vegetation has been seeded, planted, or ingressed, where there is an expectation that future disturbance may occur in that location and in ditches along a road planned to be reclaimed. This does not include soil stockpiles that have a vegetative cover.
The project	A commercial oil sands facility that is being developed for the production of bitumen or heavy oil as applied for and approved under <i>EPEA</i> . Does not include those activities not covered by the <i>EPEA</i> approval, such as seismic activity, exploration activity, and source water wells.
Topsoil placed	An activity of land reclamation whereby the soil profile has been reconstructed, including topsoil replacement as defined and specified in the approval. Subsoil has previously been placed where applicable.
Trees planted	Areas in which trees have been planted in accordance with the approved conservation and reclamation and revegetation plans.
Uniform area	An area with one soil map unit and consistent topographic (e.g., drainage, slope, aspect, vegetation) features throughout.
Weeds	Weeds as defined as controlled, nuisance, or noxious by the <i>Weed Control Act</i> (Government of Alberta, 2010) as amended.
Wetland reclamation trial	The trial program for wetland reclamation that is required under an <i>EPEA</i> approval and that is usually applied to well pads.
Year	The calendar year, unless specified otherwise.

### Appendix 3 Integration of Conservation, Reclamation, and Closure Planning and Reporting Requirements

IN SITU C&R PLANNING		Conceptual conservation and reclamation plan (project application, EIA, and amendment applications)	Predisturbance assessment information (PDA) (EPEA term and condition)	Conservation and Construction Plan (EPEA term and condition)	Project-level conservation, reclamation and closure plan (EPEA term and condition)	Annual conservation and reclamation report (EPEA term and condition)
Purpose		EIA Decision and Project Approval	Facility construction and reclamation	Facility construction and reclamation	Integrated project closure planning	Compliance and validation with EPEA approval terms and conditions
Spatial Scale		Project-scale	Site-specific	Site-specific	Project-scale	Site-specific and project-scale
Content	High-level	<ul style="list-style-type: none"> <li>Project-level C&amp;R goals &amp; objectives</li> <li>Conceptual development and reclamation plans for life of project</li> </ul>	<ul style="list-style-type: none"> <li>PDA methods</li> <li>Understanding the site-specific conditions</li> </ul>	To conserve and protect the site during the development and construction	<p>Integrated approach and proposed strategies to conservation and reclamation planning and execution.</p> <p>Provides a project-level commitment to achieving long-term, sustainable environmental outcomes postclosure.</p>	<ul style="list-style-type: none"> <li>Regulatory updates, including project amendments</li> <li>Annual summary of land status, including cleared, disturbed, and reclaimed areas</li> <li>Postconstruction information</li> <li>comparing estimates and proposed work with actual construction and conservation information</li> <li>Validates PLCRCP commitments</li> </ul>
	Baseline/Pre-disturbance	<p>Summary of relevant pre-approval baseline environmental information:</p> <ul style="list-style-type: none"> <li>Baseline terrestrial biophysical inventory (in this report and in other sections of the EIA)</li> <li>Baseline land capability</li> </ul>	<p>Detailed site-specific predisturbance conditions, including</p> <ul style="list-style-type: none"> <li>soils</li> <li>terrain</li> <li>ecosites</li> <li>vegetative; vegetation communities, wetlands, rare plants, old growth forests, species at risk, and communities of limited distribution</li> </ul>	<ul style="list-style-type: none"> <li>Use the site-specific PDA information collected to develop recommendations for conservation and construction plan developments and facility reclamation</li> </ul>	<ul style="list-style-type: none"> <li>Conservation, reclamation, and closure management areas</li> <li>Predevelopment map</li> <li>Key environmental features</li> <li>Description of legacy sites</li> <li>Compilation of conservation and reclamation commitments through various application, regulatory, and policy frameworks that guide conservation and reclamation practices</li> </ul>	<ul style="list-style-type: none"> <li>Reporting-year PDA and forecast future-year construction and reclamation activities</li> </ul>
	Conservation	<p>General conservation practices:</p> <ul style="list-style-type: none"> <li>Infrastructure and facility types</li> <li>Erosion and drainage</li> <li>Soil handling practices</li> <li>Timber salvage practices</li> <li>Materials balance plan</li> <li>Weed management</li> </ul>	<ul style="list-style-type: none"> <li>Avoidance or mitigation</li> <li>Proposed reclamation material balance</li> </ul>	<p>Site-specific conservation plan, including</p> <ul style="list-style-type: none"> <li>construction plan,</li> <li>woody material management plan,</li> <li>soil salvage plan, and</li> <li>operations plan.</li> </ul>	<ul style="list-style-type: none"> <li>Material balance</li> <li>Identification of key environmental features and applied mitigation strategy's (if applicable) to manage</li> </ul>	<p>Postconstruction reporting</p> <ul style="list-style-type: none"> <li>Results of the operations, construction, soil salvage, mitigation plans (discuss planned to actual, focusing on variances)</li> <li>Soil salvage volumes, stockpiles and placed</li> <li>Merchantable timber, non-merchantable timber and woody debris</li> </ul>



IN SITU C&R PLANNING		Conceptual conservation and reclamation plan (project application, EIA, and amendment applications)	Predisturbance assessment information (PDA) (EPEA term and condition)	Conservation and Construction Plan (EPEA term and condition)	Project-level conservation, reclamation and closure plan (EPEA term and condition)	Annual conservation and reclamation report (EPEA term and condition)
	Reclamation	Project-level reclamation plan including <ul style="list-style-type: none"> <li>• Closure land capability</li> <li>• Reclamation sequencing</li> <li>• Maps of planned facilities</li> <li>• Soil replacement</li> <li>• Postreclamation ecosites</li> <li>• General facility-specific reclamation plans</li> <li>• Revegetation practices and prescriptions</li> <li>• Reclamation monitoring plan</li> </ul>	Identification of predisturbance conditions to ensure that the disturbed areas can be reclaimed to an equivalent land capability.	Effective planning allows for site disturbance to occur in a manner for material to be conserved to use for reclamation.	<ul style="list-style-type: none"> <li>• Postdevelopment map</li> <li>• End land-use objectives</li> <li>• Mitigation strategies to apply to legacy sites to achieve closure</li> <li>• Landscape-level revegetation plan</li> </ul>	Reclamation activities conducted, including <ul style="list-style-type: none"> <li>• soil placement,</li> <li>• revegetation activities,</li> <li>• permanent reclamation summary, and</li> <li>• research and monitoring.</li> </ul>
Reference		<i>Guide to Preparing Environmental Impact Assessments</i> , GoA Mar 2013 Environmental Impact Assessment Terms of Reference, Project Specific, Standardized GOA Jan 2013 <i>Environmental Protection and Enhancement Act Guide to Content for Energy Project Applications</i> . AER. 2014. DRAFT AER Directive 023: <i>Oil Sands Project Applications</i> . AER. 2013.	<i>Direction for Conservation and Reclamation Submissions Under an Environmental Protection and Enhancement Act Approval for Enhanced Recovery In Situ Oil Sands and Heavy Oil Processing Plants and Oil Production Sites</i> , AER 2016	<i>Direction for Conservation and Reclamation Submissions Under an Environmental Protection and Enhancement Act Approval for Enhanced Recovery In Situ Oil Sands and Heavy Oil Processing Plants and Oil Production Sites</i> , AER 2016	<i>Direction for Conservation and Reclamation Submissions Under an Environmental Protection and Enhancement Act Approval for Enhanced Recovery In Situ Oil Sands and Heavy Oil Processing Plants and Oil Production Sites</i> , AER 2016	<i>Direction for Conservation and Reclamation Submissions Under an Environmental Protection and Enhancement Act Approval for Enhanced Recovery In Situ Oil Sands and Heavy Oil Processing Plants and Oil Production Sites</i> , AER 2016