SAND AND GRAVEL PIT

Progressive Reclamation Plan Guide

LACOMBE COUNTY

This guide provides information about Lacombe County's requirements for a progressive reclamation plan.

Lacombe County requires all gravel pits, regardless of size, to submit a progressive reclamation plan before a development permit will be issued. The progressive reclamation plan may be submitted with the application, or submitted following the County's issuance of a Notice of a Decision. Please note that a Development Permit will not be issued until a progressive reclamation plan has been submitted and approved by the County.

For pits that are over 5 hectares (12.36 acres) over the entire lifetime of the pit, a completed copy of the Alberta Environment and Parks (AEP) Activities Plan, including information regarding progressive reclamation, may be utilized to prepare the required Progressive Reclamation Plan. However, applicants should be aware that additional information is required in Lacombe County's written report as compared to Alberta Environment and Park's requirements for the Activities Plan. **Please ensure that all information meets the requirements outlined in this guide.**

For pits under 5 hectares (12.36 acres) over the entire lifetime of the pit, applicants must still complete a progressive reclamation plan that meets the requirements outlined in this guide.

The Reclamation Plan includes the following five parts:

Part 1: Applicant and Landowner Information

Part 2: Pit Activities

Part 3: Written Report

Part 4: Pit Activities Scale Drawings

Part 5: Reclamation Scale Drawings

The completed forms, drawings and progressive reclamation plan must be submitted to Lacombe County for approval. Further clarification, information and/or changes may be required at the sole discretion of Lacombe County. A Development Permit will be issued once Lacombe County has approved the progressive reclamation plan, and all other conditions of development approval have been completed.

For further information about the development permitting process, please call Planning Services at (403) 782-8389.

PART 1: APPLICANT AND LANDOWNER INFORMATION

Date:

Previous ***Environmental Protection and Enhancement Act*** Approval Number:

Water Act authorization required? YES ◯ NO ◯

If Yes, application submitted or current ***Water Act*** Authorization Number:

Applicant Information (company or person in whose name the pit will be registered)

Name:	Company Name:
Address:	
Phone:	Email:

Person Submitting Application

Name:	Company Name:
Job Title:	
Address:	
Phone:	Email:
Sign Here Signature:	

Primary Contact for Pit

Name:	Title:
Address:	
Phone:	Email:

Pit Location

Municipal address, or legal land description:

Registered Landowner

Name:	
Address:	
Phone:	Email:

PART 2: PIT ACTIVITIES

Aggregate Type (check all that apply):

☐ gravel ☐ sand ☐ clay ☐ marl

Current size of pit (hectares):

Average thickness in metres or centimetres for each of:

Topsoil:	Subsoil:
Overburden:	Aggregate:

Topsoil Texture (check all that apply):

☐ organic soil ☐ mineral soil ☐ clay loam ☐ silty loam

☐ sand ☐ sandy loam ☐ loam ☐ clay

☐ silt ☐ other (please specify):

Maximum planned size of pit (hectares):

Depth to groundwater (metres) in test holes (indicate each depth if multiple holes):

Planned activities at the pit (check all that apply):

☐ concrete production ☐ aggregate washing ☐ spraying truck boxes

☐ mixing asphalt with aggregate ☐ mixing salt and aggregate ☐ use of alternate reclamation materials

Proposed land uses for reclaimed pit (check all that apply, and indicate % of final land use):

☐ cultivation ☐ hayland ☐ pasture

☐ native range ☐ grassland ☐ forest

☐ wildlife habitat ☐ waterbody ☐ proposed subdivision

☐ other (please specify):

Reclamation Soil Replacement:

Average topsoil replacement depth (cm):	Average subsoil replacement depth (cm):

Surface water bodies in reclaimed pit:

Design:	
Intended use:	Water elevation at full supply level:
Slope of land one metre above full supply level	Slope of land one metre below full supply level:

Signature of person who developed Reclamation Plan:

Sign Here

PART 3: WRITTEN REPORT

This portion of the activities plan is a written report. The following outline describes the information that must be contained in the report.

Introduction

In this section, provide background information such as:

- location of pit
- previous site activities
- previous Lacombe County development permits
- previous Alberta Environment and Parks approvals and certificates
- description of proposed disturbance area in current development application

Resource Demand

Provide information regarding resource demand, including:

- anticipated use of material excavated from the pit
- whether pit will be mined continually or intermittently
- proximity to other pits

Current Pit Size / Disturbance Area

Provide information regarding existing conditions, including:

- total parcel size
- area disturbed to date if previously excavated
- area proposed to be disturbed under this development application
- total pit size, including infrastructure and improvements such as access roads, power lines and pipeline rights of way
- development sequence of the operation (by year)
- area reclaimed to date

Geography / Topography

Provide information regarding the site and surrounding geography, such as:

- location relative to significant natural features, such as rivers and lakes
- location and description of aggregate resource deposits in the area
- type of aggregate
- average aggregate depth
- overburden type and depth
- groundwater depth

Topsoil / Subsoil Composition

- average topsoil depth
- topsoil type
- average subsoil depth
- subsoil type

This information should be determined through a soil testing program performed by a qualified soil specialist.

Existing Site Conditions and Proposed Operations

Provide a written description of the following:

- attached site development plans and pre-development cross sections
- any existing or proposed infrastructure or buildings
- any infrastructure or buildings proposed to be removed, including method of disposal
- existing and proposed water diversion infrastructure, pit water discharge locations, and groundwater discharge and recharge areas
- sequence of pit operations (by year)
- site terrain and natural features, such as slope, soil types, water bodies (including wetlands) etc.
- methods to prevent impacts on water bodies
- description of groundwater elevations

Please note: approvals may be required from Fisheries and Oceans Canada and/or Alberta Environment and Parks if pit water, silt or sediment is deposited into a water body, or if a water body will be altered or destroyed.

Buffer Zones

Describe buffer zones of undisturbed vegetation that will be maintained on the site.

Buffer zones of undisturbed vegetation around pit operations are required for safety, to prevent erosion and siltation into watercourses, to reduce noise and dust, to provide wildlife corridors, and for aesthetic reasons. A three metre buffer zone from all property lines to the edge of the disturbance is recommended. Buffer zones from watercourses and water bodies are site specific and must be determined by a professional engineer. Buffer zones from rivers typically range from 30-60 metres. Some buffers may be specified in Acts, Regulations or authorizations.

Rare Plant Species and Wildlife Considerations

Describe any rare plant species in the project area, and any measures that will be taken to prevent adverse impacts. A rare species is any native species that exists in low numbers or in very restricted areas. At a minimum, Alberta Natural Heritage Information Centre must be contacted to determine if any rare species have been located in the project area.

Describe any sensitive or endangered wildlife species in the project area, and any measures that will be taken to prevent adverse impacts. Consult with a wildlife biologist to determine how to minimize disturbance of wildlife populations. Construction during breeding times is usually restricted under the *Species at Risk Act* and/or *Migratory Bird Convention Act*.

Groundwater

Describe the following:

- presence of groundwater in gravel layers
- *Water Act* applications and approvals

Pit Activities

Describe all pit activities, including:

- stripping and stockpiling of topsoil
  - topsoil must be salvaged from all areas of the pit that will be disturbed by pit operations
  - topsoil should be salvaged at least five metres ahead of all pit faces, or greater if the pit face is unstable or rapidly advancing
  - topsoil salvage should be carried out when the ground is not frozen, in order to allow separation from underlying subsoil or overburden
- stripping and stockpiling of subsoil
  - subsoil must be salvaged from excavation areas after the topsoil
  - subsoil should be salvaged at least three metres ahead of the pit face
- stockpiles of reject and waste materials from asphalt and concrete or cement production
  - must be located so that they do not come in contact with surface water or groundwater
- wet pit operations, including pit dewatering, settling ponds, sumps, bailing, water diversion infrastructure, release of pit water
- salt mixing, asphalt mixing and truck box spraying sites, including methods to prevent soil or groundwater contamination
- aggregate washing (screening, settling ponds and containment measures, proposed end use of material from settling ponds)
- use of alternative reclamation materials
  - inert waste materials such as concrete or asphalt (must be crushed and placed at least 1 metre above the seasonal high water table, and at least 1.2 metres below the final reclaimed surface)
  - soil or other geological materials from other excavations (registration holder must provide information showing that the alternative materials have not been contaminated; materials should be placed at least 1 metre above the seasonal high water table, and at least 1.2 metres below the final reclaimed surface)

Please note: asphalt paving plants must be registered with Alberta Environment and Parks

Erosion Prevention and Dust Control

Provide information regarding:

- topsoil and subsoil handling
- topsoil and subsoil stockpiling
- methods employed to prevent erosion from wind and water
- management of surface runoff
- monitoring and control of dust emissions

Erosion control is required to prevent the loss of topsoil and subsoil during construction, operation and reclamation, and to prevent adverse environmental impacts such as the siltation of water bodies. Vegetation is a widely used method to control water and wind erosion. Additional measures, such as the use of silt fences, may be required in proximity to water bodies. Conservation of topsoil and subsoil is required under the *Environmental Protection and Enhancement Act*.

Dust control is necessary to prevent adverse impacts on neighbouring land uses, safety concerns associated with driving, and health concerns such as respiratory problems or long-term impacts from dust containing silicates. Dust control measures include enclosing crushers, placing a screening system around crushing equipment, misting with water, watering driving surfaces, considering wind direction in planning pit operations, developing contingency plans for windy conditions, and the use of monitoring equipment.

Air Monitoring Initiatives

Describe the following:

- any participation in air monitoring initiatives (through an individual company or as a member of an association)
- procedure that will be followed in response to any complaints regarding emissions

Release of Pit Water

Provide details regarding any proposed release of pit water, including:

- conditions that would require release of pit water
- type of pit water to be discharged (pit dewatering, pit washing, pit runoff, other)
- techniques to release the water
- volumes to be discharged
- discharge rates
- timing of discharge
- location of discharge points
- monitoring program to ensure no adverse effects of discharge on receiving environment
- contingency plans if an adverse effect is discovered or discharge cannot occur.

Please note: water from aggregate washing or pit dewatering may not be released unless it meets the release requirements in the Code of Practice for Pits (Section 4.2).

Mitigative Measures

Describe mitigative measures that will be used to prevent adverse effects from pit activities. These may include:

- spill containment techniques
- water management plans
- contingency plans
- emergency response plans
- monitoring program to assess effectiveness of mitigative measures

Periods of Pit Inactivity

Provide information regarding:

- anticipated periods of inactivity
- site safety (slopes, water bodies, equipment, structures)
- safety measures to prevent unauthorized access
- sloping of active pit faces and pit floor to prevent erosion
- soil conservation
- erosion control methods for stockpiles not used in ongoing reclamation
- weed management

Proposed End Land Uses for Reclaimed Pit

The scale drawings and cross-sections should illustrate the reclaimed pit end land uses described here.

The end land use should be decided upon in consultation with the landowner, and determined based on the type of operation, location, surrounding uses, and requirements of Lacombe County's statutory plans and Land Use Bylaw. The end land use may dictate sloping requirements.

Potential end uses may include: cultivation, hayland, pasture, native range, grassland, forest, wildlife habitat, water body, proposed subdivision, or a combination of uses. If any other use is proposed, this section must provide details about the proposed use.

If the end land use is agricultural, reclamation should focus on restoring gentle landforms, establishing equivalent drainage, and reconstructing an acceptable soil. If the pit is located in an area of high quality farmland, the land must be returned to an equivalent agricultural capability. Land intended for cultivation should not have slopes steeper than 10:1, while land intended for forage production or pasture should not have slopes steeper than 6:1. Farmable drainage ditches should have a maximum slope of 10:1. Terraces, swales and low ridges can be used to minimize soil erosion. Reclaimed land surfaces must be at least 1 metre above the seasonal high water table. Progressive reclamation should occur during pit operation, as it may take two to three years to return the land to an equivalent agricultural capability.

If the end use is wildlife habitat, rolling hummocky terrain with irregular slopes, edges and contours are suitable. Habitat should be blended with surrounding areas, and revegetation plans should consider the types of wildlife native to the area and their needs (food, cover, escape terrain, water).

If the end land use is subdivision development, authorization for the proposed development must be obtained from Lacombe County. Subdivision development will only be considered when this opportunity is allowed for under the County's Municipal Development Plan and any other local plans. Applicants interested in subdivision development as an end land use should inquire about opportunities and requirements at Lacombe County's Planning Services.

If the end land use includes a surface water body, this section must describe the intended use (fisheries, wildlife, recreation, stock watering etc.), design, elevation of the water when the surface water body is filled to its design capacity, and the slope of the land one metre above and one metre below the full supply level. Surface water bodies must only be constructed where there is sufficient natural recharge water to maintain the design volume of water. Site drainage features that channel surface runoff into the surface water body should be constructed during the re-sloping, contouring and grading phase of reclamation. The design of the water body, including shape and slope, will be determined by the intended use.

Please note: Water Act approval is required. For a stocked fish pond, authorization from Alberta Agriculture is also required.

Soil Replacement Depths

Topsoil and subsoil replacement depths must be described for each proposed end land use.

Reclamation Phasing

Describe the phasing of reclamation activities. The scale drawings and cross-sections should illustrate the reclamation process described in this section. Considerations in reclamation phasing include:

- placement of reject material, overburden, subsoil, and topsoil
- considerations to reduce compaction on reclaimed areas of site
- revegetation, including actions to ensure materials used are weed free, and weed control

PART 4: PIT ACTIVITIES SCALE DRAWINGS

Attach scale drawings and cross-sections of existing pit conditions and planned sequence of operations. Drawings must meet the following criteria:

Site Development Plan:

- legal description of the property
- property boundaries (1/4 section lines or other parcel boundaries)
- area disturbed to date if previously excavated
- area proposed to be disturbed under this development application
- total area to be disturbed in lifetime of pit
- existing and proposed infrastructure and improvements, including but not limited to access roads, power lines and pipeline rights of way
- all watercourses or bodies of water (including wetlands) and buildings in the vicinity of the operation
- other significant topographic features of the site (e.g. valley breaks)
- existing drainage
- existing vegetation (e.g. treed areas)
- any other features that will be affected by activities at the pit
- location of existing topsoil, overburden and gravel stockpiles
- location of existing and proposed processing facilities, such as crusher, washing sites and ponds, water diversion infrastructure, pit water discharge locations and groundwater discharge and recharge areas, and
- location of cross-sectional lines.

Cross-sectional drawings:

- existing land surface elevation
- proposed depth to which the site is to be excavated
- level to which the disturbed area of the site is proposed to be restored to, in relation to the adjacent land
- slope, and
- must show the entire pit in at least two directions

(The cross-sections should be at right angles to each other and be located in a manner that shows a reasonable representation of the excavation area and the adjacent land).

PART 5: RECLAMATION SCALE DRAWINGS

Attach scale drawings and cross-sections of existing pit conditions and planned sequence of reclamation. Drawings must meet the following criteria:

Site Development Plan:

- area proposed to be disturbed under this development application
- development and reclamation sequence of the operation (by year)
- total area to be disturbed in lifetime of pit
- proposed infrastructure and improvements, including but not limited to access roads, power lines and pipeline rights of way
- any other features that will be affected by activities at the pit
- location of future topsoil, overburden and gravel stockpiles
- location of any vegetation buffers designed to impede sediment dispersal
- conceptual drawing of any end-use pit ponds detailing out water elevation at full supply limit and slope design
- location of proposed processing facilities, such as crusher, washing sites and ponds, water diversion infrastructure, pit water discharge locations and groundwater discharge and recharge areas, and
- location of cross-sectional lines.

Cross-sectional drawings:

- existing land surface elevation
- proposed depth to which the site is to be excavated
- level to which the disturbed area of the site is proposed to be restored to, in relation to the adjacent land
- slope, and
- must show the entire pit in at least two directions

(The cross-sections should be at right angles to each other and be located in a manner that shows a reasonable representation of the excavation area and the adjacent land).