

Environmental Protection Guidelines for Transmission Lines

GENERAL

This Guideline replaces *Conservation and Information Letter 95-2* and the 1994 *Guide for Transmission Lines*.

In the event of a discrepancy between this guide and any Act or Regulation, the Act or Regulation prevails.

Transmission lines do not require a Conservation and Reclamation Approval unless the Director determines an environmental assessment is required. However, operators of transmission lines are expected to adhere to the Environmental Protection Guidelines (the Guidelines). The Guidelines provide the necessary direction to achieve conservation and reclamation. Transmission lines are subject to Environmental Protection Orders and must meet the Guidelines prior to reclamation certification. Adherence to the guidelines is monitored by Environmental Protection Officers through proactive inspections and reactive complaint response. Proponents may wish to contact an Environmental Protection Officer early in the planning process. This provides the opportunity to discuss the transmission line project and the Environmental Protection Guidelines.

All transmission lines on public lands require an Environmental Field Report and a surface disposition (easement). The operator must contact Sustainable Resource Development prior to activities on public lands.

OVERVIEW OF THE GUIDELINES

The Environmental Protection Guidelines apply to the construction, operation, maintenance, and reclamation of transmission lines in Alberta. Following the Guidelines may help ensure successful conservation, and eventual reclamation and certification. They apply to all disturbances associated with the transmission line, including infrastructure (roads, work camp sites, etc.).

Environmental Protection Officers will expect to see the Guidelines being followed in the field. The Officers or operator may request modifications in the procedures in order to deal with site-specific

conditions.

Reclamation certificates can only be obtained following abandonment and reclamation of transmission lines, not during their construction or operation.

The Guidelines promote and encourage:

- The return of a disturbed site to a land capability equivalent to the pre-disturbance land capability.
- Assessment and documentation of pre-development soil, landscape and vegetation conditions as the standard for post-development conditions.
- Identification of potential environmental concerns through pre-construction site assessments and pre-planning.
- Protection of the environmental characteristics of the project site to minimize post-construction remedial requirements.
- Awareness of the value of soil, the sensitivity of soil to disturbance, and the difficulty of reclaiming degraded soils.
- Awareness of the importance of protecting native vegetation through minimizing disturbance and rapid re-establishment of vegetation that is compatible with the adjacent land.
- Monitoring and on-site supervision by personnel responsible for environmental quality control of all activities to ensure a complete record of conservation, degradation, mitigation and reclamation events.
- Site assessments following reclamation which provide a complete evaluation of soil, landscape and vegetation conditions and comparison to pre-development conditions or adjacent control locations prior to application for a reclamation certificate.
- Monitoring during the operating life of the transmission line to ensure that integrity of the environment on and adjacent to the site is maintained.

ENVIRONMENTAL PROTECTION GUIDELINES

The following sections outline Environmental Protection Guidelines for project planning, construction, operation, maintenance, and reclamation. Further information with respect to this Guide can be obtained from regional Alberta Environment offices for private lands, and from Alberta Sustainable Resources Development offices for public lands.

1. PROJECT PLANNING

Planning is the key to successful project development, land and soil conservation, and reclamation. Good planning prior to construction will anticipate problems, present or minimize environmental impact, and provide for proper reclamation. Advance planning and discussions with regulatory authorities and landowners will reduce problems. A contingency plan must be developed and implemented in accordance with these Guidelines.

1.1 Communication

Objective: Identify and resolve environmental and social concerns encountered with the project in the early planning stages. To ensure that all affected parties understand what is planned and what is happening on the project and have the opportunity for input to conservation and reclamation planning.

Considerations:

- Begin communication prior to starting field work.
- Initiate and maintain communication with land managers, landowners, occupants, other affected parties, and regional Environmental Protection Officers.
- Discuss with landowners ways of minimizing the effects of the project on their operations (e.g., timing, fencing, access, etc.).
- Educate on-site construction personnel about the Environmental Protection Guidelines and environmental concerns for the project.

1.2 Route Selection

Objective: Select a suitable route which will minimize environmental impacts while considering socio-economic, engineering and cost factors. Factors such as agriculture, forestry, fisheries, wildlife, recreation, visual resources, residences, water resources, erosion and slumping, must be considered in the route selection process. The following points will help to minimize impacts and optimize compatibility of the transmission facilities with the environment.

Considerations:

- Use existing linear developments such as road allowances, fence lines, quarter section and section lines, and existing transmission or utility or corridors.
- Retire or upgrade existing lower voltage transmission circuits to allow construction of higher voltage, higher capacity circuits on the existing right-of-way.
- Use properly sited and established right-of-ways for the location of additions to existing transmission facilities.
- Locate right-of-way boundaries to avoid creating unusable fragmented areas.
- Minimize conflict with present and planned uses of the land.
- Select right-of-ways that avoid heavily timbered areas, steep slopes, erosion or slump-prone areas, shelter belts, scenic areas, designated critical wildlife areas, natural parks, monuments, historic sites, natural areas, and recreation areas.
- Limit line of sight along the right-of-way in areas of high aesthetic and wildlife value.

1.3 Scheduling/Timing

Objective: Schedule activities to minimize environmental impact and interference with landowners' activities.

Considerations:

- Contact appropriate agencies (e.g., Sustainable Resource Development, grazing patrons) about timing restrictions on the operation.

- Contact landowners regarding their views on the timing of any activities associated with the transmission line.
- Avoid any portion of the year when weather and operating conditions may adversely affect wildlife resources.
- Stop material handling activities when soils are too wet or dry for optimum soil conservation and reclamation.
- Time revegetation efforts to take advantage of favorable moisture and temperature conditions.

1.4 End Land Use

Objective: Determine the end land use for each segment of the alignment prior to commencing surface disturbance and identify soil conservation, reclamation and revegetation methods to achieve this land use.

Considerations:

Begin early consultation with the landowner and appropriate provincial and municipal agencies (Municipal District or County) to determine the desired end land use.

1.5 Contingency Plans

Objective: Develop plans to address environmental problems that may arise and require immediate attention.

Contingency Plans:

- Develop contingency plans for issues such as soil erosion and compaction, wet weather, rock disposal, chemical spills, fire.
- Immediately implement contingency plans when required.
- Develop plans that are flexible to allow for unforeseen events.

2. CONSTRUCTION

Construction and operation activities should be planned to minimize environmental degradation. Poorly controlled construction activities can negate the best environmental planning.

2.1 General

Objective: Ensure that construction activities prevent or minimize environ-

mental impacts.

Considerations:

- Conserve and protect the environment on and adjacent to the right-of-way.
- Plan the construction so that the reclaimed right-of-way will conform to, or blend into, the surrounding landscape.
- Inform all personnel, including contractors that all aspects of their construction activities should aim to conserve natural resources, reclaim disturbed land, preserve natural beauty and provide adequate safety.
- Prior to the start of the project, provide notice of activities and scheduling to each landowner and occupant.
- Consult with landowners to select points of entry to their property.
- Define and mark the working area to confine construction activities.
- Provide reasonable access to landowners across the right-of-way during all phases of project construction to minimize disruption to normal movements of farm equipment and animals.
- Suspend activity if archaeological or historical sites are identified until permission to proceed is granted by the Archaeological Survey of Alberta.
- Select appropriate equipment to minimize environmental impact.
- Clean construction equipment brought in from outside the project area to minimize the risk of introducing pests, weeds, or diseases, such as scentless chamomile or clubroot.
- Confine construction activities to the right-of-way, designated access roads, and ancillary sites. If additional right-of-way is required during construction, obtain written approval from the landowner and approval from regulatory authorities.
- Plan and control all construction and operation activities to prevent environmental degradation caused by: soil or water contamination (pollution); soil erosion and landscape instability; and blockage of drainage or impoundment of water. Employ appropriate mitigation measures when required.

- Provide protection for undisturbed lands, especially environmentally sensitive areas.

2.2 Right-of-way Clearing and Timber Salvage

Objectives: Preserve natural integrity. Minimize visual impacts, soil loss and degradation, and disturbance of adjacent forest cover. Maximize salvage of merchantable timber.

Considerations:

- When clearing within 30 m of permanent streams or 15 m of intermittent streams, use hand cutting and winching to remove timber.
- Selectively cut vegetation and restrict grubbing in the vicinity of steep erodible slopes, erosion sensitive soils and other ecologically sensitive areas.
- When determining the time and method of clearing, take into account soil stability, the protection of natural vegetation, and protection of adjacent resources (such as wildlife habitat) and the prevention of siltation of water courses.
- Use brush rakes on bulldozers to minimize disturbance of ground cover.
- Where right-of-ways cross major highways and rivers, leave a screen of natural vegetation on each side of the road or river. If natural vegetation is such that a screen cannot be left, consider planting native types of plants, low-growing trees, etc. to provide screening.
- When clearing cannot be avoided adjacent to residences or through shelter belts, orchards, or other sensitive areas with high exposure to public view, perform it in a manner which will minimize visual impact.
- Retain a screen of natural vegetation across the right-of-way where line of sight control is required.
- Clear trees and brush as necessary to provide electrical clearance, line integrity, safety to workers and public or suitable access for construction, operation and maintenance of the line.

- Clear trees and shrubs according to long range vegetation management plans.
- Consult the *Timber Management Regulation* for specific requirements on public lands.

2.3 Aesthetics

Objective: Plan the right-of-way and locate towers to minimize aesthetic impact.

Considerations:

- Locate towers to maximize the screening effect of existing topography and vegetation. For instance, where transmission lines cross major highways and rivers, locate the transmission line towers strategically to minimize visibility and surface disturbance.
- Use alternative tower designs and colors where appropriate.
- At road crossings of two or more circuits, where only a portion of the line is visible from the highway, consider use of multiple circuit towers to minimize the visual impact of the lines at that point.
- Use high strength conductors particularly at scenic roadway, waterway, ravine and valley crossings to pick up the line sag and allow for straighter line profiles.
- When lines are adjacent to scenic highways, avoid guyed structures whenever practical.
- Locate borrow areas away from public view.
- Use helicopters for construction on right-of-ways in mountainous or otherwise inaccessible terrain and areas of scenic and historic significance.
- Consider burying lines underground for lower voltage sub-transmission lines when alignments parallel or cross scenic and historic sites, recreation areas, wildlife refuges, national and provincial parks, etc.
- In scenic or ecologically sensitive areas, consider tension stringing of conductors to reduce vegetation clearing.

2.4 Soil Salvage and Storage

Objective: Ensure that topsoil is adequately salvaged at tower and substation locations. To ensure that topsoil is properly stored for future replacement.

Considerations:

- Selectively salvage and store all topsoil for future replacement.
- Retention of soil materials for future abandonment and reclamation.
- Selectively salvage and replace sufficient suitable subsoil to improve reclamation success.
- Avoid over-stripping of topsoil.
- Store soil materials a minimum of 2 m from embankments, slumps, cuts, pits, waterbodies, and contaminant sources. Protect stored soil materials to prevent loss or degradation.
- Separate spoil materials from stored topsoil and subsoil by at least one meter.
- Seed soil stockpiles left on site with desirable, compatible grass species to inhibit weed growth.

2.5 Water Crossings

Objective: Plan and construct watercourse crossings to minimize impacts on water quality, aquatic habitats and fisheries resources.

Considerations:

- Follow requirements under the *Water Act*, including the *Code of Practice for Watercourse Crossings*.
- Obtain permission under the Public Lands Act prior to installing a crossing structure.
- Ensure a qualified aquatic environmental specialist establishes where waterbodies, as defined by Alberta Environment, are to ensure unapproved work is not conducted in a waterbody.
- Select appropriate equipment and vehicle crossing methods.
- Develop access as part of clearing operations so that no construction equipment needs to cross the watercourse, unless use of a crossing is approved.

- If extra right-of-way is required, obtain permission from appropriate landowners and regulatory authorities and mark it prior to initiation of watercourse crossing.
- Hand-clear slopes leading to watercourses. Fell trees away from watercourses to reduce damage to aquatic habitat. Immediately remove trees, debris, or soil inadvertently deposited within the high water mark of any watercourse. Do this in a manner that minimizes disturbance of the bed and banks.
- Do not skid or drag trees across a watercourse. Do not push logs into a watercourse.
- Do not place fill material in a watercourse during grading.
- When the vehicle crossing is no longer required, remove crossing structures, restore and stabilize stream beds, banks, and other disturbed areas.

2.6 Erosion and Stability

Objective: Leave the project area in a condition that protects soil and surface materials, both on and off site, against erosion and instability.

Considerations:

- Implement terraces and other erosion control measures where necessary to prevent soil erosion along the right-of-way.
- Locate and design roads to prevent erosion and sedimentation and to serve permanent service access requirements.
- Avoid road construction on unstable slopes. Where feasible, use existing service and access roads.
- Improve approach roads and existing low-standard roads which are to be used for future access by providing proper drainage and erosion control.
- As a general rule, do not machine clear (bulldoze) on slopes exceeding 35%.

2.7 Compaction

Objective: Minimize soil compaction during construction and operation of the line.

Considerations:

- Stop operations where excessively wet conditions will result in soil compaction.
- Minimize and control vehicle movement on the right-of-way to minimize compaction.
- Following construction, disc the disturbed land on cultivated areas to produce a roughened surface and friable rooting medium. When appropriate, alleviate subsoil compaction. Substations in particular may require remedial action.

2.8 Clean-up

Objective: Clean up the right-of-way in preparation for reclamation.

Considerations:

- Remove rocks, roots, slash or debris on or within the soil to conform to the adjacent land or the intended land use.
- Fell and remove leaning or damaged trees along the edge of the right-of-way.
- Remove all garbage and debris to an approved waste management facility.
- Clean up woody debris by chipping, burning, removing or scattering as required. In areas with sensitive or erosion prone soils, dispose of brush, timber and other woody debris by chipping, shredding, or other suitable means. Use this material as mulch rather than burning it. Contact Sustainable Resource Development regarding specifications on woody debris management and mulch depths.
- Pile material to be burned in a manner and in such locations as to cause the least fire risk. Take appropriate measures to prevent fire or heat damage to desirable trees and shrubs within and adjacent to the right-of-way, to conform to fire regulations, and to minimize air pollution and smoke hazards.

3. RECLAMATION

The objective of reclamation is to return equivalent land capability. This requires proper soil replacement and revegetation, as well as remediation of any soil contamination.

Specific reclamation criteria for transmission lines have not yet been developed. Reclamation criteria for wellsites will provide guidance on the type of assessment required for certification of transmission lines. Government, industry, and the public will continue to work toward the development of criteria for transmission lines.

3.1 Soil Replacement

Objective: Replace salvaged soil material so that soil depth and quality is equivalent to the original or representative undisturbed land, and capable of supporting vegetation.

Considerations:

- Replace all salvaged soil materials evenly across the right-of-way in the correct sequence.
- Do not replace frozen topsoil until it is thawed.
- When necessary, alleviate soil compaction to help establish suitable soil conditions and rooting depth.

3.2 Revegetation

Objective: Ensure the establishment and growth of species compatible with equivalent land capability and intended land use. The vegetation should be self-sustaining in uncultivated areas or sustainable under normal management in cultivated areas.

Considerations:

- Discuss revegetation methods and species with the landowner or public land manager.
- Where required, use native species, or species mixes which will allow the establishment of native species.
- Scars, as well as cut and fill areas should be fertilized and seeded promptly to stabilize soil, reduce erosion, restore a natural appearance and provide food and cover for wildlife.
- Reclaim temporary roads by restoring to original contours and revegetating with native ground cover or equivalent vegetation
- If the natural vegetation cannot be effectively saved to provide an adequate screen, plant trees and shrubs na-

tive to the area to ultimately provide the necessary screening. Consider establishing native vegetation of value as food and cover for wildlife.

- Demonstrate uniform establishment and growth of vegetation consistent with the intended land use under normal land management.

3.3 Spills and Contaminants

Objective: Ensure that levels of contaminants on the right-of-way or substation area do not become a hazard to human or animal health, do not detrimentally affect water quality, and do not impede germination, growth, survival or management of the vegetation used for reclamation.

Considerations:

- Take all measures to prevent spills.
- Contain any spills onsite and clean up all spills as soon as possible.
- Document and report all spills to Alberta Environment. Any spill, release or emergency that may cause, is causing, or has caused an adverse effect to the environment must be reported immediately to Alberta Environment by calling the 24-hour Environmental Hotline at 1-800-222-6514. Affected third parties must be notified that their property could be impacted if it is suspected that contamination has gone offsite.
- Remediate chemical contamination onsite to meet the *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* or the *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*.

4. RIGHT-OF-WAY MAINTENANCE

Objective: To maintain the right-of-way in a manner compatible with adjacent land use. The operator is responsible for maintenance of the right-of-way from the time of construction to the issuing of a reclamation certificate. Maintenance will require an appropriate and comprehensive program.

Considerations:

- Develop maintenance and monitoring plans that are flexible to allow for mitigation of unforeseen events.

- Identify and immediately reclaim areas with erosion problems.
- Re-seed areas which have not successfully revegetated.
- Implement weed control measures as directed by the Weed Control Act and/or local authority.
- Design and implement a vegetation management plan that encourages a diverse species mix that is compatible with native trees, shrubs, herbs and grasses.
- Maintain access roads and service roads to prevent soil erosion and siltation of watercourses.
- As required by Alberta Sustainable Resources Development, maintain access control to protect wildlife.
- Use vegetation control measures in scenic areas which do not cause “brown outs” or similar aesthetic impact.
- Time maintenance inspections to ensure they occur when access roads are firm, dry or frozen.

5. DECOMMISSIONING

Objective: The objectives of decommissioning transmission lines and substations are:

1. To ensure that on-site contamination is identified and appropriate steps are taken to remediate sites,
2. To protect the environment while the site is being shut down and decommissioned, and
3. To ensure that the site is reclaimed to a land capability equivalent to the pre-disturbance land capability and compatible with current adjacent land use so that a reclamation certificate can be obtained.

Considerations:

- Dismantle, decontaminate and transfer the equipment in a manner that protects the environment.
- Conduct a soil sampling program at the substation site to check for contaminants (for instance, PCB's, hydrocarbons, sterilants, and other contaminants).

- Take soil samples from locations unaffected by substation operations (near the perimeter of the property) to determine baseline levels of contaminants.
- Develop a reclamation plan to remediate and reclaim the substation site.
- Remediate or dispose of all the contaminated material in an effective and appropriate manner, to approved facilities.
- Salvage entire transmission poles including the butts where possible.
- Dismantle transmission steel structures in an effective and appropriate manner.
- Fill pole or structure holes with clean compacted sand and replace subsoil and topsoil over the holes.
- Seed and fertilize the sites with vegetation compatible with adjacent land.

FURTHER INFORMATION

Additional copies of this document may be obtained by contacting the Alberta Environment Information Centre.

Additional information may be obtained from one of the Alberta Environment or Alberta Sustainable Resource Development regional offices, by contacting one of the Information Centres:

Information Centre
Alberta Environment
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9820 – 106 Street NW
Edmonton, Alberta T5K 2J6
Phone: 780-427-2700
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