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Français	Contact Us	Help	Search	Canada Site
Home	About the Agency	Media Room	Links	Site Map

| [Previous page](#) | [Table of contents](#) | [Next page](#) |

Environmental Assessments
Public Participation
How to do Environmental Assessments
Legislation & Regulations
Training Opportunities
Research & Development
Strategic Environmental Assessment
Publications
Frequently Asked Questions

Canadian
Environmental
Assessment
Registry

[CEAR Main »](#)

*A primer for
Industry*

Will your project need
a federal EA? [More »](#)

[Search our site](#)

Reference Guide: Addressing Cumulative Environmental Effects

- 1. Introduction
- 2. The Concept of Cumulative Environmental Effects
- 3. Cumulative Environmental Effects and the Canadian Environmental Assessment Act
- 4. General Considerations
 - 4.1 Advice and Consultation
 - 4.2 Documentation
 - 4.3 Uncertainty
 - 4.4 Level of Effort
- 5. Framework for Addressing Cumulative Environmental Effects in Federal Environmental Assessments
 - 5.1 Step 1: Scoping
 - 5.2 Step 2: Analysis
 - 5.3 Step 3: Mitigation
 - 5.4 Step 4: Determining the Significance of the Effects
 - 5.5 Step 5: Follow-up
- 6. Further Reading
 - 6.1 General References
 - 6.2 References on Methods to Assess Cumulative Environmental Effects
- Appendix A: Identifying Future Projects to be Considered in an Environmental Assessment

1. Introduction

This reference guide describes an approach for addressing cumulative environmental effects under the *Canadian Environmental Assessment Act* (Act). It is one of several reference guides intended to provide the supporting documentation for the *Responsible Authority's Guide to the Canadian Environmental Assessment Act* prepared by the Federal Environmental Assessment Review Office (FEARO). All of the reference guides are complimentary to the *Responsible Authority's Guide to the Canadian Environmental Assessment Act* but go into more detail on individual issues. Specifically, this reference guide:

- reviews the concept of cumulative environmental effects;
- discusses the relevant requirements of the Act;
- outlines some general considerations;
- proposes a framework for addressing cumulative environment effects under the Act; and
- provides a list of key references on the subject.

As the practice of environmental assessment evolves, it will be necessary to update and revise both the *Responsible Authority's Guide to the Canadian Environmental Assessment Act* and the individual reference guides. These guides should be seen as evolving documents rather than as static textual materials. Any suggestions for updates or revisions should be directed to:

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2. The Concept of Cumulative Environmental Effects

The concept of cumulative environmental effects recognises that the environmental effects of individual human activities can combine and interact with each other to cause aggregate effects that may be different in nature or extent from the effects of the individual activities. Ecosystems cannot always cope with the combined effects of human activities without fundamental functional or structural changes.

Examples of cumulative environmental effects include the incremental loss of prairie wetlands caused by agricultural practices, the degradation of Great Lakes water quality by persistent toxic chemicals, global warming caused by the build-up of green house gases in the upper atmosphere, and loss of biodiversity.

For the purposes of this reference guide, cumulative environmental effects can be defined as:

The effect on the environment which results from effects of a project when combined with those of other past, existing and imminent projects and activities. These may occur over a certain period of time and distance.

Over the last few years, the assessment and management of cumulative environmental effects has become a critical issue in Canadian environmental policy. Although the importance of cumulative environmental effects is undeniable, current assessment and management techniques do not always predict or control them adequately. Since cumulative environmental effects originate at the level of individual development projects, it makes sense to introduce the concept into environmental assessment.

Cumulative environmental effects should not be seen as a new type of environmental effect. The concept is simply a recognition of the complex ways in which the effects of individual projects and activities interact and combine with each other over time and distance. Thus, to address cumulative environmental effects in environmental assessments requires no more than *thinking cumulatively*. This means considering:

- The temporal and geographic boundaries of the assessment; and
- The interactions among the environmental effects of the project, and past and future projects and activities.

To a limited extent, federal and other environmental assessments already address cumulative environmental effects. For example, most examine the *baseline* environmental conditions, which include the cumulative environmental effects of past and existing projects and activities. However, consideration

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should also be given to the cumulative environmental effects resulting from the interactions among the environmental effects of the proposed project with those of future projects and activities.

3. Cumulative Environmental Effects and the Canadian Environmental Assessment Act

Cumulative environmental effects, and a determination of the significance of such effects, are a key component of every environmental assessment conducted under the Act. Subsection 16(1) of the Act states:

"Every screening or comprehensive study of a project and every mediation or assessment by a review panel shall include a consideration of the following factors:

- a. *the environmental effects of the project, including . . . and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;*
- b. *the significance of the effects referred to in paragraph (a)"*

Although the Act does not define cumulative environmental effects, it provides some guidance on what should be addressed. First, it is clear that only environmental effects, as defined in the Act, can be considered cumulatively. Subsection 2(1) of the Act defines "environment" as:

- *the components of the Earth, and includes*
 - a. *land, water and air, including all layers of the atmosphere,*
 - b. *all organic and inorganic matter and living organisms, and*
 - c. *the interacting natural systems that include components referred to in paragraphs (a) and (b) above*
- *and "environmental effect" as:*
 - a. *any change that the project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, and*
 - b. *any change to the project that may be caused by the environment,*

whether any such change occurs within or outside Canada.

Thus, the assessment of cumulative environmental effects must consider:

- changes in the environment caused by the project;
- the effects of any such changes on:
 - health and socio-economic conditions;
 - physical and cultural heritage;
 - current use of lands and resources for traditional purposes by aboriginal persons; or
 - any structure, site, or thing that is of historical, archaeological, paleontological, or architectural significance
- any change to the project caused by the environment.

For example, a socio-economic effect (such as job losses) could be considered as a cumulative environmental effect only when it is caused by a change in the environment, as defined in the Act (such as loss of fish habitat) caused by a project. If the job losses are caused by something else (such as a re-allocation

of funding caused by the project), they cannot be addressed as cumulative environmental effects.

Second, the Act states that environmental assessments must consider the cumulative environmental effects that are likely to result from the project in combination with other projects or activities. Thus, it is necessary to decide which projects and activities will be addressed. In this regard, the Act defines a "project" as:

- a. *in relation to a physical work, any proposed construction, operation, modification, decommissioning, abandonment or other undertaking in relation to that physical work, or*
- b. *any proposed physical activity not relating to a physical work that is prescribed or is within a class of physical activities that is prescribed pursuant to regulations made under paragraph 59(b)" (subsection 2(1)).*

"Activities", however, are not defined in the Act, but could include any human activity considered to be relevant to the assessment, for example, fishing or hunting near the project.

Third, the Act states "in combination with" other projects and activities. To be assessed, then, the effects must result, at least in part, from the project, and only

those environmental effects of other projects and activities that accumulate or interact with the environmental effects of the project in question should be included in the assessment. If the environmental effects of other past or future projects are not likely to act in combination then they should not be included in the cumulative environmental effects assessment of the project.

For example, if the construction of a bridge affects the fish population in the river it traverses, then other stressors on that same fish population, such as those from a nearby mill could be included in the project EA.

Fourth, the Act states that projects or activities that have been or will be carried out must be considered. As mentioned above, many environmental assessments already consider the cumulative environmental effects of the project in combination with those of past and existing projects. What is new is that the environmental effects of projects or activities "that will be carried out" must now be examined in combination with the environmental effects of the project being proposed. This implies that, at a minimum, (only) projects or activities that have already been approved must be taken into account. The environmental effects of uncertain or hypothetical projects or activities need not be considered. Nevertheless, it would be prudent to consider projects or activities that are in a government approvals process as well. Environmental assessments can take a long time to complete, and approvals for other projects and activities may be given during the assessment of the project in question.

Where projects and activities are not subject to a formal government approvals process but are relevant to the assessment (for example pesticide spraying), they should also be considered if there is a high level of certainty that they will occur. It should be noted that this interpretation of future projects and activities will, in most cases, preclude consideration of a project's growth inducing

potential.

When there is insufficient information on future projects or activities to assess their cumulative environmental effects with the project being proposed, best professional

judgement should be used. It is not necessary to predict the environmental effects of future projects and activities in detail, but to the extent that is feasible and reasonable under the circumstances. For example, if a plan for a future project has been approved, but the design details and hence the environmental effects are not yet known, then, it is sufficient to give a general idea of the types of cumulative environmental effects that are anticipated.

Fifth, the Act recognises that not everything can be known about how the environmental effects of other projects or activities will combine with the environmental effects of the project. It says "*cumulative environmental effects that are likely*". Only *likely* cumulative environmental effects need to be considered.

Finally, paragraph 16(1)(b) of the Act requires that every screening, comprehensive study, mediation and assessment by a review panel consider the significance of the

environmental effects including cumulative environmental effects. See the document entitled, *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects, A Reference Guide for the Canadian Environmental Assessment Act* (available from FEARO).

These six points provide a basis for considering which cumulative environmental effects should be addressed in federal environmental assessments.

The Act also requires that a class screening report must be adjusted to take into account any cumulative environmental effects not otherwise addressed:

"Where a responsible authority uses or permits the use of a class screening report, it shall ensure that any adjustments are made to the report that are necessary to take into account local circumstances and any cumulative environmental effects that may result from the project in combination with other projects or activities that have been or will be carried out" [subsection 19(5)].

When a class screening report is used for a particular project within the class, the report must be revised to address any cumulative environmental effects specific to that project.

4. General Considerations

4.1 Advice and Consultation

To assess cumulative environmental effects, relevant individuals, organisations and government departments and agencies should be consulted. The extent of advisory and consultation activities will depend on the nature of the project; however, the following points should be considered:

- expert departments, regional inter-departmental environmental assessment committees, and other similar committees could be used as a source of advice and information about past and future projects and activities and their cumulative environmental effects;

- when seeking advice or conducting a consultation, specific questions about the cumulative environmental effects of past and future projects and activities should be asked;
- advice and consultation will be particularly helpful to assess the cumulative environmental effects of the project on socio-economic conditions;
- multi-stakeholder, multi-disciplinary and inter-departmental consultation, when appropriate will allow discussion of a broad range of issues and facilitate access to all relevant scientific, community and traditional information and knowledge.

4.2 Documentation

The consideration and analysis of cumulative environmental effects should be adequately documented in the assessment report. This could be done in two ways:

- as a separate section summarizing the methodological approach taken and the result of the analysis; or
- as an integral part of the analysis.

In many cases, it would be relevant to consider cumulative effects as an integral part of the analysis and still have a separate section to summarize the likely cumulative environmental effects or to discuss particular cumulative effects issues or analysis.

Consideration of cumulative effects can be reflected in the scope of assessment, the methodological approach taken for the analysis, the results of the analysis, the mitigation measures and the follow-up program.

In routine screening reports using matrices or check lists, it may be sufficient to add a section on cumulative environmental effects or provide elements that would identify:

- the interaction and combination of the effects of the project; and
- the interaction and combination of the effects of the project with other past and imminent projects and activities.

4.3 Uncertainty

There will always be some uncertainty associated with any environmental assessment. Uncertainty could be related to scientific methods and techniques, data availability and accuracy, new or unproven technology, new or unfamiliar environmental setting, etc.

Another source of uncertainty when assessing the cumulative environmental effects of a project, is in relation to future projects. For example, what future projects should

be considered in the assessment? When will that project actually proceed? Plans may be revised, cancelled or delayed at any time, even after all necessary government approvals have been obtained. In fact, many "approved" projects do not proceed for economic, technical or other reasons. The decision to include or exclude a future project from the environmental assessment should be based on the "weight of evidence", i.e. are there strong indications that a project will proceed? (See Appendix "A" for further guidance).

When the details of future projects, (e.g. design, technology, mitigation measures) are unknown or the information is not accessible, it adds to the

uncertainty about

the environmental effects of future projects and how these effects will interact with those of the project in question. Available information and best professional knowledge and judgement should be used. In most cases, only qualitative assessments of cumulative environmental effects will be possible.

Any uncertainty, whether it arises from information gaps, selected methods, etc., should be explicitly stated in the assessment report.

4.4 Level of Effort

When assessing cumulative environmental effects, it is important to ensure that the level of effort is appropriate to the scope of the project and its anticipated effects. The effort in assessing the cumulative environmental effects of a small project with little anticipated effects, such as a routine dredging operation, is obviously much less than that necessary to assess the cumulative environmental effects of a *mega-project* with likely significant effects on the environment.

5. Framework for Addressing Cumulative Environmental Effects in Federal Environmental Assessments

The following framework outlines how cumulative environmental effects can be considered at each stage of an environmental assessment.

- Step 1 Scoping
 - Identify the environmental effects to be considered
 - Identify likely cumulative environmental effects
 - Set appropriate geographic and temporal boundaries
- Step 2 Analysis
 - Assess the status of the receiving environment
 - Assess the cumulative environmental effects of the project
 - Assess the cumulative environmental effects of the project in combination with future projects and activities
- Step 3 Mitigating
 - Identify mitigation measures for cumulative environmental effects
- Step 4 Determining Significance
 - Consider existing environmental standards, guidelines and objectives
 - Where possible, consider the carrying capacity, tolerance level or assimilative capacity of the natural system(s)
- Step 5 Follow-up
 - Evaluate the accuracy of the assessment of cumulative environmental effect
 - Evaluate the effectiveness of mitigation measures for cumulative environmental effects

5.1 Step 1: Scoping

The assessment of cumulative environmental effects largely depends on effective scoping, i.e. setting the boundaries of the assessment and focus of the analysis. This section describes how to ensure that the cumulative environmental effects are adequately scoped, as part of scoping the factors to be considered in the assessment.

Scoping should include:

- identifying environmental effects to be considered;

- identifying likely cumulative environmental effects within those limits;
- setting the spatial and temporal boundaries for the assessment.

Identifying the environmental effects to be considered

Please refer to Section 1.4 of the RA's Guide for information on identifying environmental effects.

Identifying likely cumulative environmental effects

In identifying the cumulative environmental effects that are likely to result from a project in combination with other projects or activities that have been or will be carried out, the following factors must be considered:

- the environmental effects resulting from the project;
- the environmental effects of past and existing projects and human activities which may interact with those of the project;
- the likely environmental effects of future projects and human activities in the area. There is often a degree of uncertainty related to which environmental effects from which future projects and activities should be included in the assessment. The Act states that projects and activities that "will be carried out" must be considered. At the minimum, projects and activities that have been approved should be included in the assessment. Further guidance on this matter is provided in Appendix "A".

All relevant types of future projects and activities for which the environmental effects are likely to act in combination with the environmental effects of the project (i.e., not just those in the same resource sector as the project) should be considered.

For example, an environmental assessment for a hydro-electric project should consider

- *the potential environmental effects of the project; e.g. changes in the water level and flow patterns, disturbance of fish habitats.*
- *the environmental effects of relevant past and existing projects and activities; e.g. another paper mill discharging chlorine upstream may also be affecting the fish population; a dam located upstream affects the water level and flow patterns and consequently fish habitats.*
- *future projects and activities; e.g. a proponent has recently received a permit to extend a marina; another proponent is considering the exploitation of a gravel pit situated one kilometer upstream but has not yet applied for any permit. The former project should be considered further in the assessment while the latter may be excluded because there is little evidence that it will proceed. Effects from the marina that could be included in the assessment are limited to those that can be shown to interact with those of the hydro-electric project.*

Possible sources of existing information on past, existing and future projects and activities include:

- federal, provincial and municipal government departments and agencies, especially land use planners and environmental staff;
- the public registry under the Act;
- registries or files of environmental assessments maintained by provincial departments and/or agencies;
- project owners and/or operators;
- local academic and research institutions;

- local residents and community and environmental groups;
- environmental reports;
- land use maps, air photos, and satellite images;
- records of official plan or zoning by-laws;
- fire insurance maps;
- local chambers of commerce;
- assessment records; and
- industrial directories.

Setting the Spatial and Temporal Boundaries

Defining the spatial and temporal boundaries establishes a frame of reference for assessing cumulative environmental effects and facilitates their identification. Such boundaries can also influence the assessment in a variety of ways. If large boundaries are defined, only a superficial assessment may be possible and uncertainty will increase. If the boundaries are small, a more detailed examination may be feasible but an understanding of the broad context may be sacrificed. Proponents may perceive assessments with large boundaries as onerous or unfeasible, whereas the public may think small boundaries do not adequately encompass all of the project's environmental effects. Also:

- Different boundaries may be appropriate for different cumulative environmental effects. For example, the boundaries selected for cumulative environmental effects on air quality might be quite different than those chosen for effects on a particular wildlife species;
- Spatial boundaries should extend beyond a project's immediate site to include the area likely to be affected;
- Temporal boundaries may extend beyond the timing of construction and operation to include the period of occurrence of the effects.

Spatial and temporal boundaries should be established using the following criteria (listed in order of importance):

- The size and nature of the project and its potential effects;
- The availability of existing data and knowledge about the project and its environmental effects and the feasibility of collecting new data and knowledge if there are data or knowledge gaps;
- The size, nature and location of past and future projects and activities in the area, and the significance of their adverse environmental effects;
- Relevant ecological boundaries, including physiography, vegetation, land use, habitat, soil and surface materials and climate;
- Relevant aquatic boundaries, including watersheds, sub-watersheds, drainage basins, and hydrogeological discontinuities; and
- Relevant jurisdictional boundaries, including municipal, county, township or regional boundaries.

For assessments considering effects in aquatic environments, watershed, sub-watershed or sub-sub-watershed boundaries are often used.

Most importantly, the boundaries of an assessment should be reasonable. In many cases, it will be appropriate to consult with the affected public in making this determination. Obviously, the form of such consultation will depend on the size and nature of the project and its environmental effects. When screening small projects, it may be sufficient to discuss the boundaries with a few relevant people. For public reviews of large projects, it may be necessary to consider the matter at one or more public scoping sessions. Whatever boundaries are set, they may influence the determination of significance, because a cumulative environmental effect may be very significant locally, but of little significance

regionally.

5.2 Step 2: Analysis

The objective of the analysis is to identify the environmental effects of a project and determine the significance of these effects. It is only when a project's effects are known and understood that it is possible to determine and implement effective mitigation measures, and to make an informed decision about supporting the project.

Analysis should include an assessment of:

- the status of the receiving environment, including its important characteristics and other stressors (e.g. how have past projects and activities affected or stressed the environment)?
- the cumulative environmental effects of the project, including:
 - interactions among effects the project may cause in the environment, such as those between effects on water quality and effects on fish resulting from sedimentation and destruction of the shoreline vegetation cover;
 - interactions among any effects on:
 - health and socio-economic conditions;
 - physical and cultural heritage;
 - current use of lands and resources for traditional purposes by aboriginal persons;
 - any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, caused by changes in the environment; and
 - interactions among changes to the project caused by the environment.

As well, a consideration of the *combined* environmental effects of all aspects of the project should be included. For example, if the creation of a dam is dividing a small community into two parts and affecting fish and wildlife used for subsistence activities, the interaction and total sum of these effects on the community should be assessed.

As with environmental assessment in general, there is no one approach or methodology for all assessments of cumulative environmental effects. Different circumstances, such as location of project and type of potential environmental effects will dictate appropriate methodologies. Modelling, expert systems and geographic information systems are being increasingly used. However, where information is lacking, qualitative approaches and *best professional judgement* are used.

An environmental assessment of low level air defense training in New Brunswick evaluated the potential interactions among the various components of the project and the identified valued ecosystem components. Interactions were assessed using a rating system to indicate the magnitude, duration, geographic extent and probable frequency of occurrence of expected interactions.

5.3 Step 3: Mitigation

Prior to determining the significance of any cumulative environmental effects, the need for technically and economically feasible mitigation measures that could reduce or eliminate the effects should be considered [paragraph 16(1)]

(d)].

Mitigation measures could include:

- avoiding sensitive areas such as fish spawning areas or areas known to contain rare or endangered species;
- adjusting work schedules to minimise disturbance;
- engineered structures such as berms and noise attenuation barriers;
- pollution control devices, such as scrubbers and electrostatic precipitators; and
- changes in manufacturing, process, technology, use, or waste management practices, such as substituting a hazardous chemical with a non-hazardous one, or the re-cycling or re-use of waste materials.

Cumulative environmental effects identified in a screening of a pulpwood agreement in B.C. were mitigated by adjusting the rate-of-cut, constructing streamside buffers and varying the cut block size.

5.4 Step 4: Determining the Significance of the Effects

After taking into account any appropriate mitigation measures, the likelihood and significance of the cumulative environmental effects must be determined. Relevant

environmental standards, guidelines and objectives, such as the Canadian Water Quality Guidelines, should be helpful in the determination of significance. As well, it may be helpful to consider the carrying capacity, tolerance level or assimilative capacity of the area, even though it may not be possible to quantify them.

The determination of significance consists of three general steps:

- Step 1: Deciding Whether the Environmental Effects are Adverse
- Step 2: Deciding Whether the Adverse Environmental Effects are Significant
- Step 3: Deciding Whether the Significant Adverse Environmental Effects are Likely

Criteria for determining the adversity, likelihood and significance of environmental effects are discussed in a separate document entitled *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects, A Reference Guide for the Canadian Environmental Assessment Act* (available from FEARO). These criteria should be used in making this determination for cumulative environmental effects.

The key difference between determining the significance of environmental effects and determining the significance of *cumulative* environmental effects is the influence of other projects and activities. Thus, the incremental cumulative environmental effects of certain projects may be deemed to be significant, when considered in the broader context of the effects of other projects and activities.

The significance of cumulative environmental effects of a project may depend on the existing condition of the environment. For example, the cumulative environmental effects of a hydro-electric dam in an area of rare mixed prairie grassland, already degraded by past activities, may be significant, whereas in

another type of ecosystem they may not.

5.5 Step 5: Follow-up

In the case of comprehensive studies, mediations and panel reviews, the need for a follow-up program should be considered as part of the assessment. A follow-up program should monitor:

- The accuracy of the environmental assessment with regard to its assessment; and/or
- The effectiveness of any mitigation measures.

A follow-up program to monitor cumulative environmental effects may be appropriate when:

- The project is likely to cause new or different cumulative environmental effects;
- The project involves new or unproven mitigation measures whose ability to reduce cumulative environmental effects is uncertain;
- An otherwise familiar or routine project is proposed for a new or unfamiliar environmental setting;
- Where there is some uncertainty about the conclusions of the assessment of cumulative environmental effects;
- Project scheduling or operational details are subject to change such that the cumulative environmental effects could be different from those described in the EA.

Follow-up programs should take account of using and/or supplementing existing programs that monitor cumulative environmental effects.

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Appendix A: Identifying Future Projects to be Considered in an Environmental Assessment

Introduction

To identify which future projects should be considered in an assessment of cumulative environmental effects conducted under the Act, best professional judgement and consultation should be used. There is no simple rule that can be applied to include or exclude future projects from the environmental assessment of the project in question.

In general, when building permits have been issued or when there have been amendments or adjustments made to land use plans, it is relatively certain that the future project will proceed.

Other types of project approvals, such as issuing permits, licenses, leases or easements, the completion and acceptance of an environmental assessment and land use plans can be considered as sufficient evidence that a future project will proceed, depending on the circumstances.

Other information indicating that a future project will proceed, especially information from local developers or builders or the owners and operators of existing facilities should also be considered, especially when it is in writing and is consistent with other indications that a future project will proceed. For example, if the owners of a local industry intend to expand in the next five years and work on an environmental assessment or a permit is underway, then it would be wise to consider the expansion as a future project that will proceed for the purposes of the Act.

Similarly, if an environmental assessment has been completed and accepted and a lease, permit or license has been issued, then it would be wise to assume that the future project will proceed.

In these cases, the decision should be based on the 'weight of evidence' that a future project will proceed. 'Weight of evidence' decisions usually take into account:

- **The quality of the evidence:** Are the indications that a future project will proceed strong or weak?
- **The quantity of the evidence:** Is there one indication that a future project will proceed, or several?

In most cases, future projects that may result from the project's 'growth inducing ability', unless they have been approved, or are in an approvals process will not be considered as part of the cumulative effects analysis.

Whatever future projects are included in assessments of cumulative environmental effects, the reasons and relevant information supporting the decision should be presented in the environmental assessment report.

Types of Approvals

There are many different types of government approvals processes for projects. Municipal, provincial and in some cases federal approvals may have to be obtained, depending on the nature and location of the project. It would be virtually impossible to describe all of the approvals required for all different types of projects in all locations in Canada. Instead, this section outlines the major types of approvals.

It should be noted that the provinces often delegate their authority for land use planning to municipalities. Thus, in most cases, municipalities often have primary responsibility for project approvals, even if provincial licenses and permits are required. There are, however, two major exceptions to this where the federal government often has primary jurisdiction for land use planning and project approvals. These are federal Crown lands and the territories. Federal Crown lands include airports, national parks and wildlife area, ports and harbours, canals and national defence facilities.

Building Permits: Most municipalities require proponents to obtain a building permit before construction can be started. Building permits are issued following a review of building specifications, designs and plans to ensure compliance with Building Code and other requirements. Obtaining a building permit is usually the final step before construction. Future projects with building permits are therefore virtually certain to proceed. For projects on federal Crown lands or in the territories, building permits may be required. Building permits are a very strong indicator that a future project will proceed.

Amendments or Adjustments to Land Use Plans: In many cases, projects will require amendments or adjustments to land use plans. Possible amendments and adjustments include Official Plan Amendments and Re-zoning. These approvals are usually municipal and are given prior to the issuance of a Building Permit. There are various terms used to describe this type of approvals process, depending on the circumstances and the requirements of the land use legislation. Amendments or adjustments to land use plans are a strong indication that a future project will proceed.

Other Types of Permits and Licenses: Sometimes, projects will require federal and/or provincial licenses and permits. Licenses and permits are required for many

activities. Some types of facilities, such as nuclear power plants, require operating licenses and others may require permits for effluent discharges. For example, a federal permit under the Fisheries Act may be required if the project involves

discharges to the aquatic environment. Similarly, a provincial permit, such as a Certificate of Approval under Ontario's Environmental Protection Act, may be required to emit pollutants to the atmosphere.

The federal government issues many different types of permits and licenses that allow activities on federal Crown lands or in the North. They include timber harvesting permits, land use permits and National Energy Board licenses.

The issuing of federal and provincial licenses and permits should be taken as a good indication that a future project will proceed. Permits that allow a change in environmental conditions, such as permits to discharge to air or water may be helpful in identifying the environmental effects of future projects.

Leases and Easements: The federal government can lease Crown lands to an individual, a corporation or other types of organisations. Similarly, it can grant easements over Crown lands. Leases are often issued for the management of facilities, such as ports and harbours. They provide a good indication that a

future project will proceed.

Environmental Assessments: Environmental assessments can also be used as an indication that a project will proceed. However, it should be noted that environmental assessment is not a decision making process, except in Ontario. Elsewhere in Canada, environmental assessment is an aid to decision-making, rather than being a project approvals process. Nevertheless, the completion and acceptance of an environmental assessment by the relevant jurisdictional department or agency indicates that a future project is likely to proceed.

Land Use Plans: Federal, provincial or municipal land use plans are another indication of future projects, but they are probably the least definite indicators of future projects. For public facilities and projects, such as roads and buildings, land use plans should contain details of the location and timing of future projects. However, for private developments such as residential, commercial and industrial construction, land use plans are likely to be more vague. Zoning restrictions may provide a general idea of the types of future projects that would be permitted, but not in sufficient detail to assess cumulative environmental effects.

Other Indications of Future Projects: In addition to the approvals process outlined above, land sales can be used as an indication that a future project will proceed. For example, if Crown land is sold to a developer then a future project is likely to proceed.

Other sources of information about future projects that will be carried out include:

- Local developers and builders;
- Local residents and community groups, and
- The owners and operators of existing facilities in the area.

Wherever possible, these people and any other person that can provide relevant information should be contacted. Written information from reliable and authoritative sources that can be included in the environmental assessment of the project in question is preferable to anecdotal evidence or hearsay.

[| Previous page](#) | [Table of contents](#) | [Next page](#) |

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Important Notices