

*The Newsletter of the Canadian Institute of Resources Law*

## The Future For Cumulative Effects Management: Beyond The Environmental Assessment Paradigm

by Steven A. Kennett\*

### Introduction

The challenges of cumulative effects are both complex and immediate for all those concerned with environmental management and resource development in Canada. As the range and intensity of human pressures on the land and resource base increase, it is clear that individual projects and activities cannot be considered in isolation. Important environmental, social and economic objectives are unattainable without attention to the combined impact on the landscape of a multitude of past, present and future activities.

Cumulative effects assessment (CEA) within the context of project-specific environmental assessment (EA) is currently the *de facto* instrument of choice for addressing cumulative effects in Canada. Consideration of cumulative effects is a legal requirement of EA regimes in several Canadian jurisdictions,<sup>1</sup> and the development of improved methods to conduct CEA has been a major

focus of attention for EA practitioners and commentators.<sup>2</sup> Despite progress in improving CEA, there remains a significant level of dissatisfaction with this process on the part of industry, environmentalists, regulators and other interested parties. This dissatisfaction is the product of the demands that CEA places on the participants in project-specific EA and of the uncertainty, litigation and disappointed expectations that have all been associated with the short history of CEA.

This article is the second of a two-part series that examines problems with CEA and suggests ways that cumulative environmental effects could be better addressed within EA, regulatory and resource management processes. In the previous issue of *Resources*, the EA of the proposed Cheviot coal mine was used to illustrate the difficulties facing project proponents and review panels as they endeavour to meet CEA requirements.<sup>3</sup> The argument developed in that article was that a leadership role by government as land and resource manager is essential in order to conduct

effective and efficient CEA within the EA process.

The objective here is to make the case that a broader legal and policy framework should be developed to address cumulative environmental effects. While project-specific CEA will continue to have an important role within this expanded framework, there are important structural reasons why EA can no longer serve as the focal point for the consideration of cumulative effects within environmental management. This article will identify the most important limitations of CEA and describe briefly the principal components of a new, planning-based paradigm for managing cumulative effects. These arguments are developed in more detail in a paper entitled *Towards a New Paradigm for Cumulative Effects Management*, published by the Canadian Institute of Resources Law in December, 1999.<sup>4</sup>

### The Environmental Assessment Paradigm

Two trends in Canadian environmental management have shaped the treatment accorded to cumulative effects. The first trend is the progressive formalization of EA and its increasing scope and public profile. EA is frequently the lightning rod for concerns

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## Résumé

L'auteur de cet article soutient qu'il faudrait développer un cadre juridique et politique plus large pour remplacer l'évaluation environnementale qui est actuellement le principal outil de gestion des effets cumulatifs au Canada. L'évaluation environnementale est un processus spécifique à un projet et mené par le promoteur d'un projet qui opère en l'absence d'un contexte de politique et de planification pour traiter des effets cumulatifs. Il en résulte des problèmes structurels pour l'évaluation des effets cumulatifs, notamment dans les domaines suivants: 1) la gestion des effets cumulatifs résultant d'activités en elles-mêmes mineures, mais dont les effets cumulatifs sont importants; 2) l'existence d'une base de données et d'analyse nécessaire concernant les effets cumulatifs; 3) la détermination de l'importance et de l'acceptabilité des effets cumulatifs; et 4) le choix d'outils politiques permettant de gérer les effets cumulatifs.

Le nouveau cadre proposé pour gérer les effets cumulatifs comporte cinq éléments essentiels. En premier lieu, il requiert une approche pro-active et à base de planification pour remplacer l'approche réactive et spécifique à un projet qui caractérise l'évaluation des effets cumulatifs. Deuxièmement, le gouvernement devrait assumer la responsabilité principale en matière de gestion des effets cumulatifs. Troisièmement, le nouveau cadre requiert l'établissement d'objectifs à l'échelle du paysage en entier et de seuils spécifiques aussi bien pour les effets que pour l'utilisation des ressources. Quatrièmement, l'aménagement du territoire et l'évaluation environnementale spécifique à un projet devraient être coordonnés au sein d'un cadre général de gestion intégrée des terres et des ressources.

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regarding major decisions on resource development. In addition, it attracts a degree of legal scrutiny that the administrative processes relied on for land and resource management in Canada are generally able to escape.

The second and more recent trend is the decline in institutional capacity to manage public land

and resources that has occurred in some jurisdictions. Deregulation and 'downsizing' have been guiding principles of public administration. Overall, most governments in Canada have yet to establish the systems of public land law and integrated resource management that are required to ensure a logical progression of decision making in support of sustainable development.<sup>5</sup>

The result of these two trends is the emergence of EA as the primary instrument of cumulative effects management in Canada. The consideration of *cumulative effects* is thus undertaken within a legal and policy framework that was designed primarily for the review of *individual* project applications.

This framework can be conveniently referred to as the conventional EA paradigm for cumulative effects management. It has three principal characteristics, each of which contributes to its inability to address complex cumulative effects issues in a satisfactory manner.

First, the conventional EA paradigm relies primarily on a reactive and project-specific process to address cumulative effects. EA is triggered by project applications and is directed towards determining the acceptability of individual projects and formulating the regulatory requirements that should be imposed on those projects that are found to be acceptable.

Second, it is proponent-driven. Project proponents play a lead role in EA, having primary responsibility for providing the information and analysis required by decision makers and bearing a significant portion of the costs incurred throughout the process.

Third, the EA process operates in many cases without a developed policy and planning context.

Participants, including decision makers, often have little guidance from policies or planning processes when determining project acceptability.

As a result of these characteristics, EA encounters difficulties in several key areas when the range of issues to be examined expands to encompass the cumulative effects of multiple projects. These difficulties are 'structural' because they are inherent in the design and operation of the conventional EA paradigm or they require policy responses that cannot be delivered from within that paradigm.

### Structural Limitations of Cumulative Effects Assessment

The most common general critique of CEA is that the overly restrictive spatial and temporal parameters of project-specific EA are the principal impediments to an adequate treatment of cumulative effects.<sup>6</sup> The fact that these parameters are arbitrary in practice and elastic in principle suggests, however, that they may not constitute insurmountable barriers. Some commentators have argued that the incorporation of CEA requirements into the EA process constitutes the natural evolution and maturing of this process into a more effective and comprehensive instrument of environmental management. This line of thought is captured in the observation that CEA is EA done better, or simply "done right".<sup>7</sup>

If one probes beneath the general critique, it becomes evident that CEA encounters serious structural problems in four key areas:

(1) the management of cumulative effects resulting from individually insignificant but cumulatively important activities;

(2) the provision of necessary baseline information and analysis regarding cumulative effects;

(3) the determination of the significance and acceptability of cumulative effects; and

(4) the available choice of policy instruments to manage cumulative effects.

These problem areas provide the basis for the argument that a new paradigm for cumulative effects management should be developed.

#### (1) Individually Insignificant Activities

The first area where CEA encounters structural problems is in the management of activities that are individually insignificant at a landscape or ecosystem scale but nonetheless produce significant cumulative effects. A progressive 'nibbling' at valued resources can occur through activities such as agricultural practices, small-scale forestry operations, road building and other linear disturbances (e.g., seismic lines, electric power lines and pipelines), incremental filling of wetlands, non-point source pollution of watersheds, and urban development. Although the results can be ecologically disastrous, EA is generally unable to respond to these activities and project-specific regulation is ill-suited to controlling them.

The root of the problem is that EA is explicitly designed to exclude or screen out projects having 'insignificant' impacts. This strategy makes eminent sense from the perspective of a relatively intensive, expensive and time-consuming review process that focuses on evaluating the acceptability of proposals and fashioning project-specific terms and conditions for approval. The result, however, is that the 'nibbling' phenomenon cannot be addressed effectively as long as the conventional EA paradigm is the primary instrument for cumulative effects management.

The recent examination by Creasey of the well-site approval process for oil and gas operations in Alberta provides a striking case study of the failure of the conventional EA paradigm to address multiple activities that, when viewed in terms of landscape and ecological values, are individually insignificant but cumulatively important.<sup>8</sup> Although thousands of well sites are approved each year in Alberta, Creasey shows that there is no effective consideration of cumulative effects within the linear and incremental process that begins with the issuance of mineral rights and ends with the authorization to clear a well-site and drill a well. He identifies six principal "administrative barriers" that impede consideration of cumulative effects in this context:<sup>9</sup>

(1) applications for individual well sites are formally excluded from the EA process established under Alberta's *Environmental Protection and Enhancement Act*;<sup>10</sup>

(2) the Alberta Energy and Utilities Board — the agency responsible for approving well-site applications — can no longer screen applications effectively to consider cumulative effects in relation to wells proposed for environmentally sensitive areas because it has adopted an expedited regulatory process in response to an increased volume of applications and reductions in the Board's funding;

(3) regulators and developers face significant difficulties in trying to address cumulative effects that result in large measure from the decisions and actions of others;

(4) there is no policy framework or land-use planning process that is capable of providing the overall vision and objectives for the public land base and the specific resource development priorities and thresholds that are needed to

manage a multitude of individually insignificant but cumulatively important activities;

(5) the environmental information required to assess cumulative effects within an ecosystem management framework is often unavailable; and

(6) the incremental and multi-agency decision making that applies to well-site development means that no individual agency or regulatory process is accountable for cumulative environmental effects.

The EA process and regulatory regime described by Creasey are thus unable to address the significant cumulative effects that are associated with an important category of industrial activity in Alberta. Although his analysis focuses on a single case study, it has broad implications for cumulative effects management. The "administrative barriers" that Creasey identifies relate directly to the project-specific and proponent-driven characteristics of the conventional EA paradigm and to the fact that it lacks a developed policy and planning context for CEA.

#### (2) Baseline Information and Analysis

The difficulty of securing adequate baseline data and analysis for CEA is a second area where structural problems within the conventional EA paradigm are evident. Participants in project-specific CEA encounter a familiar set of problems when compiling information on cumulative effects. These problems include gaps in data, inaccessibility of existing data, incompatibility of the data and information systems of different data holders, and inadequate analysis and synthesis of data. Obtaining information on the impacts of previous development projects is often

particularly problematic, either because monitoring programs do not exist or because the results of these programs are unavailable to participants in EA processes.

These problems can be traced directly to the three defining characteristics of the conventional EA paradigm. To begin, the time limitations and financial constraints that quite appropriately apply to project-specific regulation may make it difficult or impossible for review panels to obtain the information required for CEA. The proponent-driven nature of the EA process is a second source of problems. While it makes sense to require proponents to supply information regarding the characteristics and direct impacts of their proposed projects, they may lack the resources to address cumulative effects or they may be unable to obtain the detailed and sometimes confidential information from other businesses that is required for CEA. Finally, the absence of a well developed environmental management framework for EA means that the institutional capacity within government to provide data and analysis in support of CEA may be lacking.

Decision makers in project-specific CEA are thus in a difficult position. Unable to generate necessary data and analysis themselves, they cannot reasonably rely on proponents to fill the gaps and they lack the external sources of information that would allow them to place project-specific information in a broader cumulative effects context.

### **(3) Criteria for Significance**

The establishment of criteria for assessing the significance of cumulative effects is a third area where the conventional EA paradigm encounters structural problems. Throughout the EA process, judgements regarding the

significance of effects are used to narrow the focus of factual inquiry, analysis and decision making. The efficiency and effectiveness of EA depend on avoiding the trap of attempting to 'study everything'. For the EA process to work properly, the demands for information and analysis must be tailored to meet the needs of decision makers. These needs, of course, reflect the fact that a decision or recommendation on project acceptability is the end point of the EA process.

Determining the significance of cumulative effects is a complex task that involves considering the impacts of all relevant human activities, including the project under review, in light of baseline environmental information, trends in land and resource use, and objectives for future environmental conditions. At the heart of this process is the marriage of scientific analysis and policy choice. Once the scientific data are assembled and the analysis of causal relationships completed, a subjective judgement is required to determine significance. This judgement depends on the establishment of resource use or impact thresholds against which the significance of cumulative effects can be measured. The thresholds selected should be a function of desired future conditions and the environmental, economic and social trade-offs required to reach alternative end-points.

The principal characteristics of the conventional EA paradigm for cumulative effects management again constitute obstacles to this important component of CEA. The legal and policy regime for EA is generally of little assistance in determining significance because it establishes only a generic framework for project-specific review processes. Project proponents, the drivers of the EA

process, are not well placed to provide guidance regarding the fundamental public policy choices that are inherent in significance criteria. Finally, the absence of a developed policy and planning context for EA means that there are often no externally-generated significance criteria for proponents and decision makers to apply in project-specific review processes.

Given this situation, one option is to explicitly develop significance criteria as part of the EA process. The difficulty with this alternative is that these criteria inevitably reflect fundamental policy choices that give rise to often intense interest- and value-based conflicts regarding alternative scenarios for the development or preservation of land and resources. Project-specific EA is generally an inappropriate venue to make these types of choices for four principal reasons:

- (1) relevant information on the environmental conditions and relative ecological importance of the landscape in question may be unavailable;
- (2) using project-specific EA as a vehicle for a general debate on land-use policy and priorities is unfair to project proponents;
- (3) the EA process may not accommodate easily — or even be open to — the wide range of individuals and groups who may wish to speak to fundamental land use issues, but who are affected only peripherally or not at all by the specific project under review; and
- (4) it is questionable whether the panels and agencies responsible for project review should be charged with making fundamental decisions about land and resource use in the absence of a well developed process to ensure open public debate and political accountability.

As argued by one commentator on CEA:

"Setting a priori growth constraints and environmental resource use standards through a series of disjointed regulatory decisions violates the democratic basis of public choice and is an inefficient way of managing public resources."<sup>11</sup>

The conventional EA paradigm, however, cannot help but treat CEA in an incremental and project-specific manner.

#### **(4) Limited Management Options**

A fourth area where the conventional EA paradigm exhibits structural deficiencies is the limited array of management options that it offers to address cumulative effects. Identifying and managing cumulative environmental effects requires, by definition, a focus on the total ecological impact of human activities across a specified landscape. These cumulative effects are often the result of activities within several sectors (e.g., forestry, energy, agriculture, transportation, recreation, etc.). Furthermore, the long term objective of cumulative effects management is presumably to regulate the totality of land and resource uses with a view to 'making room' on the landscape for the optimum mix of highest value activities, measured according to economic, social, ecological, aesthetic and other criteria.

Cumulative effects management therefore requires access to a broad range of regulatory levers that can be applied to the principal human activities within the region in question. However, the defining characteristics of the conventional EA paradigm present significant obstacles to achieving this comprehensive and flexible regulatory response. As a project-

specific review process linked to particular regulatory decisions, EA is not designed to evaluate regulatory options for the full range of present and likely future land uses in an area. Existing patterns of land and resource uses tend to be viewed as 'given' and potential future uses are generally treated as independent variables. The onus to develop mitigation strategies that is placed on project proponents within the EA process also limits the management options that are examined. Finally, the incorporation into decision making of proactive management strategies to address cumulative effects is impeded by the absence of an adequate policy and planning context for CEA.

The restricted array of management options is a major drawback to using the conventional EA paradigm as an instrument of cumulative effects management. Taken together with the other areas of structural problems noted above, it suggests that a new paradigm for addressing cumulative effects is required.

#### **Components of a New Paradigm**

There is a growing consensus in the commentary on CEA that significant changes to environmental management are necessary if cumulative effects are to be addressed adequately. While efforts to improve CEA from within the EA paradigm may continue to yield some marginal gains, the fundamental problems cannot be addressed simply by expanding or refining that process.

The basis for a new paradigm for cumulative effects management is described in the paper mentioned at the outset of this article<sup>12</sup> in greater detail than is possible here. The following section therefore provides only a brief outline of the five key components of that paradigm.

It should be noted at the outset that these components are intended to overcome the structural problems that are inherent in the conventional EA paradigm. The objective is not to replace project-specific CEA entirely. Although CEA will clearly have a more narrowly focused set of objectives under the new paradigm, there will remain a need to consider cumulative effects during the review of individual projects. This review process, however, should be viewed as a component of a broader framework for cumulative effects management

The first component of the new paradigm is the adoption of a proactive and planning-based approach to replace CEA as the principal instrument of cumulative effects management. The core argument is that anticipatory and comprehensive regional planning is more consistent with the purposes, scope and decision-making needs of cumulative effects management than are incremental, reactive and project-specific review and regulatory processes. In particular, a well designed and effectively implemented planning regime would:

- (1) provide regulators with the landscape objectives and regulatory tools (e.g., land-use zoning) that they need to address the 'nibbling' phenomenon resulting from the individually minor activities that are not caught by EA processes and detailed project-specific regulation;
- (2) generate, through ongoing research and monitoring, the baseline environmental data and analysis required by decision makers, project proponents and others with an interest in cumulative effects issues;
- (3) establish a forum for defining policy goals and regional

thresholds relating to land and resource use; and

(4) address incrementalism in decision making and fragmentation among jurisdictions and agencies by ensuring that the full range of activities on the landscape are regulated in a manner that is consistent with a single set of principles, objectives and thresholds.

The need for government leadership is a second theme that runs throughout the critique of CEA and is central to the new paradigm for cumulative effects management. This theme warrants emphasis because it represents a significant departure from the allocation of responsibility in the proponent-driven EA process. More generally, it runs counter to the prevailing trends of deregulation and downsizing in government and suggests limits to the applicability of the proponent-pays and polluter-pays models for environmental management.

The argument that government should assume primary responsibility for cumulative effects management reflects a recognition that CEA places demands on project proponents that are both inappropriate and, in many cases, unattainable. It implies both ideological and fiscal adjustments as governments assume a greater role in managing competing land and resource uses.

The establishment of objectives and thresholds for land and resource use is the third element of the new paradigm for cumulative effects management. A process is required to set goals and develop explicit limits for human activities. Concepts such as 'carrying capacity' and 'limits to acceptable change' are sometimes used to capture the essence of this exercise in establishing priorities and constraints. Whatever conceptual model is followed, the result is a

series of specific priorities and thresholds that inform the choice between competing scenarios for development or preservation and can be used to guide management activities and decision making on individual projects.

The literature on this topic suggests a two-step process for establishing thresholds once broad landscape goals are established. First, impact thresholds can be established using indicators of the health or integrity of the biological communities that constitute valued ecosystem components (VECs). For some VECs, preserving viable populations of 'indicator' species may provide a proxy for a wide range of other ecosystem components. The second step is to translate these biotic or landscape indicators into specific thresholds for land and resource use. Road density, for example, may be a useful threshold variable in areas where habitat fragmentation and increased accessibility constitute significant cumulative threats to VECs.

A regional focus for cumulative effects management is the fourth key feature of the new paradigm. This focus is required because cumulative effects often occur across broad landscapes, whether through alterations in patterns of land use (e.g., habitat fragmentation or the conversion of land to industrial or recreational uses) or through the combined effects of other activities on regional ecosystems (e.g., pollution discharges into a watershed). It is also necessary because management of many of the VECs that are at risk from cumulative effects is only possible at a landscape level.

Establishing appropriate management boundaries and aligning institutional arrangements with these boundaries are two obvious challenges. Securing adequate baseline information and

establishing monitoring programs are also important elements of the regional approach.

The final key element of new paradigm for cumulative effects management is the establishment of a direct linkage between planning and EA. This objective could be achieved by ensuring that the planning activities of identifying goals, priorities and thresholds for land use are connected with a project review process that determines whether specific proposals are in conformity with overall goals and are appropriate to specific locations. A proactive, planning-based approach to cumulative effects management thus provides a planning and policy context for these project-level decisions that both simplifies the decision-making process and ensures that cumulative impacts of incremental project approvals will be consistent with regional objectives for land and resource use.

In order to link planning and project-specific CEA within a broader framework for cumulative effects management, some attention to the legal and institutional underpinnings for cumulative effects management is required. A more fully developed argument for an integrated body of public land law as the basis for land and resource management is made elsewhere.<sup>13</sup> The point here is simply that achieving meaningful cumulative effects management requires that the objective-setting, information-gathering and land-use planning processes at the front end of the decision-making continuum for cumulative effects management should be at least as rigorous, transparent, and inclusive as the EA processes that apply to particular projects.

A legal framework is also required to ensure that the policy and planning processes are accorded

due weight by those charged with project-specific decision making. Particularly when project review and regulation is undertaken by *ad hoc* panels or quasi-judicial agencies with broad legal mandates, prior policy and planning decisions without legal foundations can offer only limited guidance and, in any case, can never be binding. The flexibility thereby achieved arguably comes at a steep price, measured both in the resulting uncertainty and open-endedness of the project review process and in the relative devaluation of efforts to establish policy and planning parameters for land and resource use.

### Conclusion

The proposed new paradigm for cumulative effects management involves an integrated approach to land and resource management that begins with fundamental policy and planning choices and extends to project-specific CEA and subsequent regulatory decision making. It thus represents a clear alternative to the conventional EA paradigm in two respects. First, it establishes a broader legal and policy framework to replace EA as the primary instrument of cumulative effects management. Second, it puts in place the necessary preconditions for the essential, but more restricted, consideration of cumulative effects within project-specific decision making.

The challenge of cumulative effects management should not be underestimated. There is no easy way to design a process that balances economic and environmental objectives, achieves efficiency and predictability in the review and regulation of individual project proposals, allocates roles and responsibilities appropriately between government and project proponents, and provides for public involvement and democratic accountability

when making fundamental decisions regarding the use of public land and resources. It is increasingly clear, however, that EA alone cannot possibly meet this challenge. Furthermore, continuing reliance on the EA process as the principal instrument of cumulative effects management will result not only in shortfalls from the perspective of environmental management, but also in an unacceptable level of stress on the EA system itself.

The implications of this analysis are clear. A failure to develop a new paradigm for managing cumulative effects puts both the environment and the EA process at risk. In addition, an EA process that becomes mired in cumulative effects issues that it cannot properly address will likely constitute a significant deterrent to economic activity, thereby imposing direct costs on Canada's economy. There are strong reasons to believe, therefore, that industry, environmentalists, government and the public at large would all benefit from the development of a new paradigm for cumulative effects management.

The potential thus exists for the key players concerned with land and resource management in Canada to achieve a measure of consensus regarding the deficiencies of the conventional EA paradigm and the broad outlines of a new paradigm for cumulative effects management. This consensus, in turn, would provide the basis for the major policy development and law reform effort that is required to ensure that cumulative effects are addressed at all stages of an integrated decision-making process for land and resource management. If progress could be made in this direction over the coming years, Canada would take a major step forward on its tortuous path to sustainable development.

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### Notes

1. CEA requirements are found in: *Canadian Environmental Assessment Act*, S.C. 1992, c. 37, s. 16(1)(a); (Alberta) *Environmental Protection and Enhancement Act*, S.A. 1992, c. E-13.3, s. 47(d); (British Columbia) *Environmental Assessment Act*, S.B.C., c. 35, s. 22(j); *Mackenzie Valley Resource Management Act*, S.C. 1998, c. 25, s. 117(2)(a).
2. For the most recent and comprehensive initiative to improve CEA in Canada, see: George Hegmann *et al.*, *Cumulative Effects Assessment Practitioners Guide*, Canadian Environmental Assessment Agency, February 1999.
3. Steven A. Kennett, "Cumulative Effects Assessment and the Cheviot Project: What's Wrong with this Picture?" (1999) 68 *Resources* 1.
4. Steven A. Kennett, *Towards a New Paradigm for Cumulative Effects Management*, CIRL Occasional Paper #8 (Calgary: Canadian Institute of Resources Law, 1999).
5. These issues are examined in: Steven A. Kennett, *New Directions for Public Land Law*, CIRL Occasional Paper #4 (Calgary: Canadian Institute of Resources Law, 1998) and Steven A. Kennett & Monique M. Ross, *In Search of Public Land Law in Alberta*, CIRL Occasional Paper #5 (Calgary: Canadian Institute of Resources Law, 1998).
6. Harry Spaling & Barry Smit, "Cumulative Environmental Change: Conceptual Frameworks, Evaluation Approaches, and Institutional Perspectives" (1993) 17 *Environmental Management* 587 at 589.
7. Peter N. Duinker, "Cumulative Effects Assessment: What's the Big Deal?" in Alan J. Kennedy, ed., *Cumulative Effects Assessment in Canada: From Concept to Practice* (Calgary: Alberta Association of Professional Biologists, 1994) at 11.
8. J. Roger Creasey, *Cumulative Effects and the Wellsite Approval Process*, A Thesis Submitted to the Faculty of Graduate Studies in Partial Fulfillment of the Requirements for the Degree of Master of Science, Resources and the Environment Program, University of Calgary, December 1998.
9. *Ibid.*, at 103.
10. *Environmental Assessment (Mandatory and Exempted Activities) Regulation*, Alta. Reg. 111/93, Schedule 2(e) Exempted Activities.
11. Eugene Z. Stakhiv, "An Evaluation Paradigm for Cumulative Impact Analysis" (1988) 12 *Environmental Management* 725 at 740.
12. Kennett, *supra*, note 4.
13. Kennett, *supra*, note 5.

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### Towards a New Paradigm for Cumulative Effects Management

by Steven A. Kennett  
1999. 53 pp. Occasional  
Paper #8. \$15.00

Cumulative environmental effects are increasingly recognized as a major challenge for environmental and resource management in Canada. At the present time, cumulative effects assessment (CEA) in the context of project-specific environmental assessment is the *de facto* instrument of choice for addressing cumulative effects. This paper argues that a fundamental paradigm shift is required.

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