Focusing on Receptors

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Abstract

Effect pathways are often complex, comprising multiple components of the natural and human environment. In some recent environmental assessments (EAs), the British Columbia (BC) Environmental Assessment Office (EAO) has differentiated between Valued Components (VCs) that are *intermediate components* (ICs) along effect pathways and *receptor components*[3]. These EAs describe changes in ICs expected to result from the project, and the consequence of those changes to receptor components is then examined. Thus, the analysis, and particularly the discussion of significance, is focused on the receptor components, instead of physical media through which effects are transferred. The use of ICs has been one effort to reduce duplication and overlap, and increase clarity, in assessments. This paper reviews the benefits of and challenges related to differentiating between intermediate and receptor components as a means of focusing EA in provincial EA practice in BC.

Introduction

EAs in BC use a values-based framework to promote a comprehensive, yet focused, understandable, and accessible assessment of potential effects, while making the most effective and efficient use of resources. This framework relies on the use of VCs as a foundation for the assessment (EAO 2013).

Selecting appropriate VCs allows the assessment to be focused on those aspects of the natural and human environment that are of greatest importance to society. Using VCs also improves the effectiveness and efficiency of assessment, in part by helping to focus the analysis on key project-environment interactions and ensure appropriate study methods are used (EAO 2013).

The VCs required to be assessed in a provincial EA[4] in BC are specified in project-specific Application Information Requirements (AIR) issued by EAO following public and Working Group[5] consultation. In some cases, this is supported by the proponent providing an initial rationale for the VCs proposed to be assessed.

As in many jurisdictions, over time, EAs in BC have become larger and more complex, as both EA process and practice have evolved and awareness of and participation in EA has increased. It is very important that the EA process remains accessible to a wide range of participants and

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[3] An IC is defined as a component of the natural or human environment that is measurably changed by the project, which change then causes an effect on another component of the natural or human environment. A receptor components is defined as a component of the natural or human environment that is measurably affected by the project and which forms an endpoint of a given effect pathway.
[4] The proponent's EA is contained in its Application for an EA Certificate submitted to EAO. Following its review of the Application, EAO prepares its own EA Report to support statutory decision-making.
[5] Comprised of government representatives and Aboriginal groups.

that it generates the information required to support robust decision-making. Therefore, it is a priority in EAs to maintain the focus of assessment on key project issues and impacts, while continuing to improve the consistency, efficiency, and quality of the EA.

EAO's Approach

In 2013, EAO established the *Guideline for the Selection of Valued Components and Assessment of Potential Effects* (EAO 2013) (the VC Guideline), which aimed to address these and other challenges. The intent of the VC Guideline was, in part, to promote the selection of VCs that are appropriate and have desired attributes, to minimize the degree of duplication and redundancy in the assessment, and therefore to focus the analysis on the project-environment interactions of greatest importance and consequence and on the components most valued by society (EAO 2013).

EAO advises proponents to develop a list of candidate VCs on the basis of comprehensive issues scoping and then to evaluate the relevance and suitability of those candidate VCs for assessment against a range of criteria. These criteria encourage the practitioner to explicitly examine whether each candidate VC is measurable, whether it could be better represented by another VC or is itself representative of one or more other VCs (*e.g.,* other species from the same guild or occupying a similar ecological niche or affected by the project in a similar way), and whether the candidate VC is a component of an effect pathway upon which other candidate VCs depend (*e.g.*, aspects of the natural environment upon which fish, wildlife, or people depend).

With respect to effect pathways, EAO recognized the significance of adverse effects to physical media – which are intermediate on an effect pathway – was usually being assessed in relation to the significance of effects on (usually biological) receptor components. EAO therefore advised proponents in most cases, rather than include these physical media, or ICs, as VCs, the assessment should focus on the ultimate receptor component that is of concern. Since the VC Guideline requires significance to be determined for VCs, this has often led to focusing the determination of significance on receptor components. EAO's VC Guideline noted that, in some cases, for some kinds of projects, it may be appropriate to select an IC as a stand-alone VC, particularly if there is potential for significant adverse effects on the IC and/or the IC is of particular concern. An IC may also be selected as a VC when the IC is more amenable to measurement and monitoring than the receptor component.

Since 2013, following the VC Guideline, some provincial EAs have differentiated between ICs and receptor VCs. Some of the most common ICs have been air quality, water quality, acoustic conditions, and soil and terrain, as well as some human components, such as population. These assessments have described the changes that would result from the project and discussed the interaction with receptor components, but generally have not determined the significance of changes to the ICs. Rather, significance has been determined in relation to consequential effects on receptor VCs, drawing on the information pertaining to all the relevant ICs on which the receptor VC depends.

Our Experience

What's Worked Well

Implementation of the VC Guideline has contributed to improvement in the transparency of IC and VC selection. In some cases, EAO has directed proponents to provide a stand-alone report documenting the proposed ICs and VCs (based on the Guideline) and the rationale for their

selection. This has supported engagement of government, Aboriginal groups, and the public regarding the scope of the EA specified in the final AIR.

The new guidance has also led to greater consideration of effect pathways and use of ICs in provincial EAs, particularly for physical media. The increased discussion about and use of ICs has improved understanding of the linkages between components on effect pathways. Use of ICs can reduce related or redundant significance determinations by focusing significance on receptor VCs. For example, the threshold of significance for a change in a physical medium has often been defined in relation to whether a consequential effect on a receptor VC is considered to be significant. Thus, a significant adverse effect for air quality, for example, would typically be defined as one that results in a significant adverse effect on human health or exceeds a criterion that was established to protect human health. If both air quality and human health are assessed as VCs, the significance determinations would be largely duplicative. By shifting the focus of significance determination to the receptor VC only, a single but more relevant and meaningful significance determination can be made in the context of the effect pathway.

Use of ICs can also decrease the duplicative content in EAs, as chapters describing the changes in ICs do not need to draw in as much material from dependent receptor chapters to support a determination of significance for the IC. At the same time, cross-referencing robust IC chapters can avoid duplicating descriptions of the changes in various effect pathways in each dependent receptor chapter. This improved documentation has the potential to improve the efficiency and effectiveness of the Application review by EAO and other EA participants, and to improve clarity of issues for decision-makers.

What Challenges Have Arisen

Notwithstanding these beneficial outcomes, some EA participants and EAO have identified challenges with using ICs, based on the experience of some EAs.

Because the VC Guideline differentiated between ICs and VCs, this led to a perception among some EA participants that ICs are not inherently valued. It is common for some participants to view some physical components of the environment, such as air or water, as having intrinsic value of their own. Further, for professional or personal reasons, some EA participants are particularly interested in ICs and want or expect to see changes in ICs dealt with at the same level of detail as receptor VCs. These factors have led to strong views in some EAs that ICs should be treated the same as receptor VCs (and particularly include a determination of significance). Seeking to resolve whether an IC should have its own significance determination (a decision made by EAO based on input from the Working Group, the public, and the proponent) takes time during the EA review process and can contribute to process delays and uncertainty. In response to concerns, in some cases, intermediate physical media have been assessed as VCs. Consequently, physical media are not consistently assessed as ICs in EAs across BC.

Concern about the use of ICs has sometimes arisen due to inadequate documentation or assessment of ICs by proponents. Neither EAO's VC Guideline nor its other complementary guidance are prescriptive with respect to the assessment of ICs; this has resulted in varying approaches by different practitioners. While some EAs provide comprehensive, well-documented descriptions of project-induced change in ICs, others provide a lighter treatment. As a result, EA participants sometimes find it difficult to understand or track how effects may propagate along effect pathways to receptor VCs, or even which receptor VCs may be affected by changes in an IC.

Concern has been raised about whether the assessed receptor VCs adequately capture the range of potential project effects along an effect pathway. If some relevant receptor VCs are

omitted from assessment, this can impact the credibility of an EA and require additional discussion and analysis during the EA review process to resolve, potentially contributing to process delays and uncertainty. Further, if the linkage between ICs and receptor VCs is not clear, it can be difficult for the reader to understand the importance (or significance) of changes along the effect pathway and how these are influencing receptor VCs. This clarity is important to support EA and post-EA decision-making (*i.e.*, permitting).

Lastly, in some cases, measuring the impacts of a project can be more difficult for a receptor VC than an IC. For example, measuring potential project impacts on water quality can be relatively straightforward, while estimating the impacts of changes in water quality to fish or fisheries as a result of the project can be more challenging. This increases the importance of ensuring changes in ICs and the linkages between ICs and receptors are adequately described.

Conclusion and Next Steps

In consideration of the challenges identified in the first few years of practical use of ICs in EA in BC, EAO is currently exploring opportunities to clarify its guidance for proponents and practitioners to, among other things, better describe the role and purpose of ICs, refine criteria for identifying intermediate and receptor components, and strengthen guidance regarding the appropriate level of detail required for the assessment and documentation of both intermediate and receptor components and the pathways that link them.

EAO continues to stress the importance of proponents appropriately documenting their rationale for component selection to better support effective engagement of government, Aboriginal groups, and the public regarding the appropriate focus of the EA.

EAO also continues to promote approaches that ensure assessments remain focused on the key issues and impacts for each project, by guiding the technical assessment to focus on the important pathways and components, facilitating reader comprehension of and access to information of interest in the EA, and realizing efficiencies in EA documentation and the overall EA process.

When properly selected, assessed, and documented, the identification of intermediate and receptor components shows promise as a tool to focus EA and improve the clarity and efficiency of EA review processes. To realize this outcome, guidance for practitioners must be clear and establish minimum information requirements to promote quality EAs that enable effective participation by government, Aboriginal groups, and the public. In particular, transparency regarding effect pathways, linkages between intermediate and receptor components, and determination of significance appears to be an essential factor in effective use of ICs in EA.

References

EAO (British Columbia Environmental Assessment Office). 2013. Guideline for the Selection of Valued Components and Assessment of Potential Effects. Available on-line: http://www.eao.gov.bc.ca/VC_Guidelines.html. 45p.