

EIA follow-up

Roles and stakes in environmental impact assessment follow-up

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This article presents some of the innovative practitioner experiences with environmental impact assessment (EIA) follow-up discussed at a workshop during the recent IAIA'01 conference in Colombia. Key issues raised included how EIA follow-up is initiated and who is responsible. Examples driven by proponents, regulators and the community are presented. Key points are that a focus on environmental management is essential, both proponents and the community directly benefit from EIA follow-up outcomes, preparation for follow-up should occur early in the EIA process and follow-up is particularly important to ensure implementation of mitigation measures and in cases where cumulative effects occur.

Keywords: EIA follow-up; mitigation; cumulative effects; environmental management

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THERE IS A LONG HISTORY of interest and professional practice in environmental impact assessment (EIA) follow-up (for instance, Bisset, 1980; Culhane *et al*, 1987; Sadler, 1987). Through monitoring, auditing and evaluation, EIA follow-up can ensure that the expected benefits of EIA forecast during the pre-decision stages of the process are achieved during project implementation and management. Furthermore, it enables the lessons learned from experience to improve future practice of EIA. Without follow-up, EIA may be little more than a paper-based exercise to obtain project approval. Despite its importance, this topic has received less attention in the literature than other aspects of the EIA process.

An upsurge of interest in experience in EIA follow-up has been facilitated at recent annual conferences of the International Association for Impact Assessment (IAIA). Background information about the subject and the findings from the IAIA'00 conference in Hong Kong can be found in Arts *et al* (2001). This article provides a sequel and presents some of the innovations in EIA follow-up from around the world explored at the recent IAIA'01 conference in Cartagena, Colombia (26 May–2 June 2001). A workshop entitled “EIA follow-up: outcomes and improvements” (Morrison-Saunders *et al*, 2001) was facilitated over two days of the conference to bring together professional practitioners to share their expertise in the subject.

The workshop was attended by more than 50 people from 18 countries (regions represented included Europe, North and South America, Asia, Africa and Australia/New Zealand). All three working

environments — private practitioners (consultants and proponents), government and academia — were represented.

During each of the three workshop sessions, several formal presentations were made followed by lively group discussions. The emphasis was on the major outcomes of EIA follow-up programmes with which practitioners are involved and how these programmes may be improved in the future. EIA follow-up practices ranged from the technically sophisticated (for instance, in Hong Kong) to very simple low-profile approaches (for instance, in developing countries and where the local community is involved). They also ranged from proponent-driven procedures to government-driven or legislatively based approaches.

The discussion here is divided into two parts. The first presents some outcomes of recent EIA follow-up programmes. The second part examines recent initiatives to improve follow-up practice. The discussion revolves around the incentives and motivation for conducting EIA follow-up: what are the roles and stakes of the various parties involved in doing it? The article concludes with some of the key lessons learnt from the workshop.

Outcomes of EIA follow-up

A key theme that emerged from the workshop presentations and subsequent discussion concerned the motivation for conducting EIA follow-up. There are three principle stakeholder groups involved in any project undergoing EIA:

- the proponent;
- the regulators; and
- the community.

Each of these may provide the incentive for undertaking follow-up programmes and examples of each were presented during the workshop. In practice, however, it is not always clear cut to separate the driving forces to conduct follow-up, for instance, separating proponent motivation from public pressure to do so. Also, the outcomes of EIA follow-up may be more or less beneficial to different stakeholders. Some examples drawn from the outcomes of existing follow-up programmes follow.

Proponent-driven EIA follow-up

Ross *et al* (2001) presented several case studies of follow-up related to cumulative environmental assessment (CEA). An example where the proponent was self-motivated to undertake such studies involved an offshore natural gas well in the Gulf of Guayaquil, Ecuador, on the Pacific Ocean. The project has the usual range of potential impacts associated with this type of development.

Also, there is the presence of the city of Guayaquil

with its sewage and urban runoff, upstream agricultural operations (mostly banana plantations) that release pesticides into the water, and upstream gold mines (mostly very small 'artisan' miners) that release arsenic into the watercourses. These other human activities contribute to possible cumulative impacts in the Gulf of Guayaquil. The main valued ecosystem component of concern is a million dollar per year shrimp fishery. If any waterborne contaminants were to have an adverse effect on the shrimp, there would be compensation issues and a potentially serious liability for the gas-well operator.

As a consequence, the matter of liability has been the driving force for the gas-well operator to start EIA follow-up. When examining the EIA carried out for the proposed gas well, Ross *et al* (2001) were able to find a good deal of information about the other human activities and their possible contributions to cumulative effects on the shrimp fishery. However, they were not able to identify a practical means of managing the cumulative impact.

In discussions with the EIA consultant, it became clear that others potentially contributing to the cumulative impact were not interested in co-operating in the necessary environmental management. Thus, the key to managing the cumulative impact, from the petroleum industry perspective, was to undertake sufficient monitoring and environmental management of the operations to protect it from paying compensation in the event that others caused a problem.

Such a CEA follow-up is not required under Ecuadorian EIA legislation. Even so, it was worthwhile for the gas-well proponent to assess cumulative impacts and to assemble enough information to allow it to determine the causes of possible impacts merely to protect itself from liability in the event of an adverse impact.

This example indicates the importance of the outcomes of follow-up studies in managing cumulative effects. It also demonstrates that, even without a legislative mandate for EIA follow-up, it can be economically and financially wise for a proponent to do so (Ross *et al*, 2001). This last point was also raised by Marshall (2001b) in relation to enhancing mitigation implementation during EIA follow-up, as the following example demonstrates.

The outcomes of follow-up studies are important in managing cumulative effects: an Ecuadorian gas-well project also demonstrates that, even with no legislative mandate, it can be economically and financially wise for a proponent to do EIA follow-up

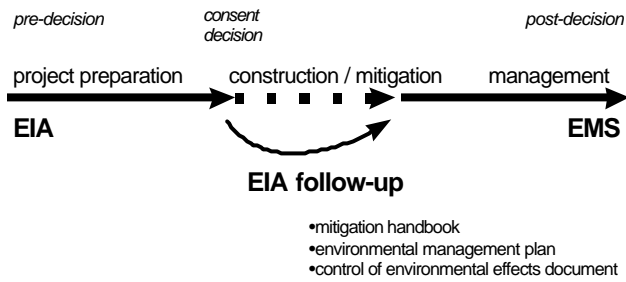


Figure 1. EIA follow-up linking EIA and environmental management

Source: Based on Marshall (2001b)

In the case of ScottishPower, an electricity utility network provider in the UK, the proponent is both self-motivated and externally driven to conduct EIA follow-up. Self-motivation is largely associated with attaining and maintaining certification under ISO 14000 series environmental management systems (EMS). Additionally, as a long-standing industry with high community visibility and impact on occasion, it is important to ScottishPower to maintain community acceptance. This is also a major driver for environmental management performance including EIA follow-up.

Marshall *et al* (2001) suggest that, from a public perception, utility developments are always in the “wrong place”. Consequently EIA continues to be a valuable assessment tool in minimising likely adverse effects, enhancing design and reducing conflict. Similarly follow-up programmes enhance EIA and project management performance.

While EIA procedures in the UK require the preparation of an environmental impact statement (EIS) for certain proposals, there is no statutory requirement to implement mitigation measures outlined in the EIS (Marshall, 2001a). No further action is legally required unless the mitigation measures proposed are clearly identified in approval conditions or are clearly marked within site plans approved by the EIA decision-maker.

In a suite of 1118 mitigation proposals from 41 EISs Marshall (2001b) found that only in 700 (62%) was the proponent viewed as being committed to their implementation, whilst the remaining 418 (38%) were expressed in such a way that the proponent could not be held to be committed to their implementation. Clearly mitigation is of little value if it remains as a series of proposals in an EIS.

Marshall (2001b) reported on several projects operated by ScottishPower in which three types of environmental management tools (a mitigation handbook, an environmental management plan (EMP) and a control of environmental effects document) were used to facilitate the implementation of mitigation measures. In each case, ScottishPower undertook the follow-up on its own initiative, not because they were required to by regulators.

The mitigation handbook was used to document how mitigation measures established during EIA for a project were implemented in practice. Similarly,

the purpose of the EMP was to provide a continued link between the environmental impact statement (EIS) for a project and subsequent approval conditions, and the detailed design, preparation of contract documents, construction and operation phases of the project. The control of environmental effects document was developed for a project for which formal EIA was not required, but for which ScottishPower undertook its own EIA study anyway. Following the informal EIA study, the control of environmental effects document was prepared to guide the mitigation measures for the project.

On the basis of these experiences, Marshall (2001b) suggests that for many industries and companies, EIA now acts as an important pre-construction planning exercise in which design attributes, site and routing strategy, and mitigation concepts are closely examined prior to finalised design and project costing. It is important that the design commitments that mitigate environmental impacts and assist in gaining project approval are carried through into practice. Follow-up enables this to occur.

The EIA follow-up and environmental management tools developed by ScottishPower are flexible in their scope and their approach to specific forms of development; they can also be articulated into certified EMS (Figure 1). Consequently both the local community and the company benefit from this approach to EIA follow-up.

Marshall *et al* (2001) further articulated how follow-up can provide a valuable linkage between EIA and EMS. They suggest that one of the fascinating aspects of EIA is its flexibility; few other methodologies can be adapted so readily to wide-ranging forms of development or perceptions of environmental effect.

They argue that, in seeking to incorporate EIA into EMS, it is important for companies like ScottishPower that the system remains flexible and practical, whilst allowing operational control. No company can allow its EMS to stifle initiative and ingenuity, but equally companies have to demonstrate documented controls and the basis of decision-making processes that impact on local populations.

In addition, they argue that EIA is only truly successful when its findings are incorporated into a company’s business-making processes. Without this linkage it remains purely a regulatory-driven information-gathering exercise on behalf of the consenting authority. Marshall *et al* (2001) suggest that the findings and conclusions of an EIA can be transferred into action through successful integration within the EMS structures of a company. This process can be achieved through EIA follow-up measures such as those outlined previously.

It can be concluded that motivation to engage in EIA follow-up to maintain good standing with the community is most likely to arise in circumstances in which proponents are seeking to avoid adverse impacts. In contrast, follow-up programmes directly

arising from community or public pressure seem more likely to appear after impacts have occurred and thus the roles and stakes of proponent and community are distributed differently.

Community-driven EIA follow-up

An example of community-driven EIA follow-up arose at Map Ta Phut Industrial Estate in Thailand (Ross *et al* (2001). The estate comprises over 50 industries on a 700 ha (hectare) site causing cumulative effects that resulted in adverse health impacts in the Map Ta Phut community. The most important proved to be the fugitive emissions of volatile organic compounds (VOCs). Although individual industries within the estate had been subject to EIA, they did not work well in that they failed to identify the cumulative effect.

The adverse health impacts at Map Ta Phut were well identified by several people, including medical specialists and local Buddhist monks. The impacts were widely recognised and action was demanded. Because of the considerable public concern, the Thai Government recognised the importance of cumulative-effects management for the Map Ta Phut industrial estate and put in place a diverse 'action plan' to manage cumulative effects.

Additionally, a follow-up programme focusing on VOCs and health effects was implemented. The programme involved the people in Map Ta Phut using the simplest and most sensitive monitoring devices available; their noses! When they noticed an odour that tended to make them sick, they formed a monitoring committee, composed of locals, monks and some others willing to serve. The committee would determine which of the industries was releasing the VOCs. Once this was known, the industry could use the monitoring committee's sensitive monitoring device to detect the source of the fugitive emission and take appropriate remedial action.

To date, Ross *et al* (2001) understand that some twenty million dollars have been spent in several industries to alleviate VOC impacts and that the magnitude of the problem has been reduced by about 80%. This example illustrates the importance of effective monitoring leading to management action to reduce cumulative impacts. It also illustrates the usefulness of public involvement, both to demand better health and to take part in the follow-up to manage cumulative impacts.

The importance of public pressure to do EIA follow-up can also be seen in other cases. For instance, because of public complaints about odour nuisance by a large waste-management facility in Dordrecht (the Netherlands) this issue was included in the EIA follow-up programme: this resulted in a different management of the facility (see Meijer and van Vliet, 2000; Arts, 1998).

Similarly Morrison-Saunders (1998) discusses cases in Western Australia where public concern during the review of EISs, or initiated during project

construction and operation, led to monitoring and environmental-management action by proponents. Public pressure, both explicit (for instance, direct complaints) and implicit (for instance, the fear of negative publicity), was found to have been an important influence to engage in EIA follow-up.

Regulator-driven follow-up

Hong Kong provides an example in which the EIA regulator has been the major driving force to undertake follow-up (Au, 2001). In this extremely urbanised area, pressures for both socio-economic development and environmental protection are ever increasing. As a consequence, the Government looked for a better control of the environmental impact of development both in the pre-decision stages (by requiring EIAs) and the post-decision-stages (by requiring environmental management and auditing (EM&A)).

The US\$20 billion Airport Core Program projects have been instrumental in the development of the EM&A system. Government required an EM&A programme because of the huge impacts on the natural and human environment and the cumulative effects caused by the airport development. Since no formal EIA regulations existed at that time, various indirect channels were used to implement EIA follow-up: lease; planning consents; licences and contracts.

However, the implementation of EIA follow-up was not always successful; the implementation of the EM&A programme was doubted and no coercive action could be taken for non-compliance. As a consequence, in 1998, the EIA Ordinance came into effect that provides for a firm regulatory basis for EIA follow-up. The main reasons why the Hong Kong Government requires EIA follow-up (Au, 2001) are:

- to supplement the inherent uncertainty in impact prediction;
- to provide a structure for implementation of mitigation measures and impact management; and,
- to improve future predictions.

The EIA follow-up requirements become statutory through environmental permits, and construction or operation contrary to permit conditions constitute an offence. Various frameworks for EIA follow-up are employed in Hong Kong:

- the environmental team model, in which the proponent or contractor employs an environmental team responsible for the environmental monitoring and management of the project;
- the independent checker model, in which the proponent employs an independent person checking the EIA follow-up results produced by the contractor's environmental team; and
- the environmental project office model, in which

an independent environmental office oversees multiple projects in a area to monitor and manage cumulative impacts (for instance, in West Kowloon).

These frameworks mainly differ in the division of roles and tasks of the various parties involved in EIA follow-up.

The evolution of follow-up initiatives in Hong Kong highlights the evolving nature of EIA practice in an ongoing attempt to address perceived deficiencies in the system.

Outcomes relevant to various stakeholders

From the previous discussion, it can be concluded that EIA follow-up for EIA projects can result in outcomes relevant to proponents, community and government alike (Figure 2). Benefits for proponents range from protection from liability, maintaining community acceptance, maintaining EMS certificates, better project management and establishing a 'green profile' or image. For communities, EIA follow-up can provide enhanced knowledge about real impacts occurring in their neighbourhood, reduce uncertainties about (cumulative) impacts, and generate adequate management responses to complaints and concerns about nuisances, safety or health issues.

Ross *et al* (2001) argue that (cumulative) health issues should be the most important in carrying out EIA in urban areas. For responsible authorities, EIA follow-up is relevant by providing for a linkage between pre-decision and post-decision stages. In addition to providing a mitigation linkage (for instance, Marshall *et al*, 2001 and Figure 1), follow-up structures such as monitoring and auditing can provide an account of EIA performance, regulatory compliance, mitigation performance evaluation, verification of

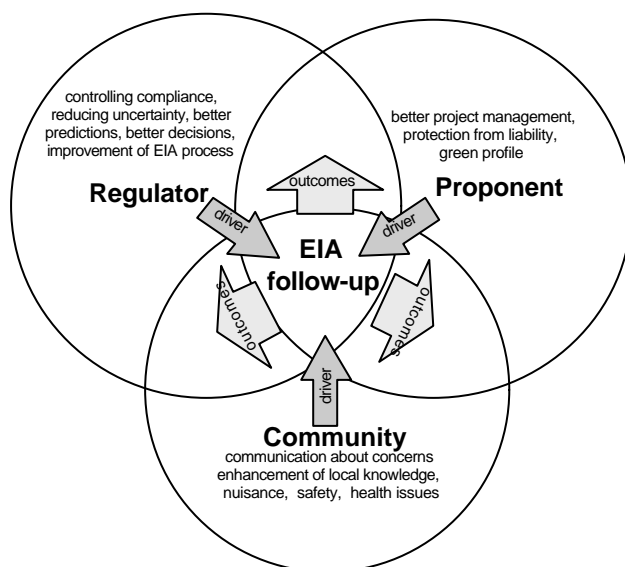


Figure 2. Outcomes of EIA follow-up for different stakeholders

residual effects and linkages into contractual, permitting, licences and other management systems. Many of these functions overlap and interlink with the intentions of EMS and environmental permitting.

Having stated that EIA follow-up for projects may result in relevant outcomes according to the stakes of the various parties involved, an important question is how to improve EIA follow-up. In other words, how can the division of roles, tasks and responsibilities of the parties involved be improved to enhance the value of EIA follow-up for them.

Improvement of EIA follow-up

A number of workshop presentations focused on innovations in EIA follow-up designed to improve future practices. Some of them have already been addressed above. In most cases these improvements were initiated by EIA regulators and represented attempts to address identified deficiencies in existing EIA practices.

Public involvement using the Internet

Having adopted a strong regulatory framework for EIA follow-up, a remaining challenge in Hong Kong was how to involve the public in EIA activities, and especially during project construction and operation (Au, 2001). The value of public involvement in EIA follow-up in Hong Kong has led to new regulations designed to improve public participation. The adopted approach utilises the Internet to create the world's first cyber environmental monitoring and auditing system. Some of the key features of this electronic system are:

- electronic transmission of environmental monitoring and auditing results;
- automatic issuance of notices of exceedance (NOE): when an emission standard is exceeded, electronic alerts can be activated enabling quick response by regulators;
- data tracking with graphing: graphs and other figures presented in colour provide a clear and easy format for the public to understand monitoring results;

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- e-mail notification of NOEs, complaints, licences, overdue actions, executive summaries, construction activities and so on; and
- storage of EIAs and EM&A manuals.

One of the main advantages of having a web-based system is that access to information on projects is available to all citizens at any time, as the statistics of visitor numbers demonstrate. During the period April 1998 to February 2001 some 2,200 people physically visited the EIA Ordinance Register Office while some 75,000 visits to the EIA Ordinance website were recorded over the same period (Au, 2001). Clearly, Hong Kong is a highly developed nation with a high usage of electronic communication so this means of public participation is effective here; it may be less appropriate for other countries.

Communication via Internet web pages enables greater detail, including visual information, such as photographs and maps, to be transmitted to the public compared to traditional means, such as newspaper advertisements. It can also be done at less cost to proponents and regulatory authorities. In addition to communicating information to the public, the system enhances the opportunities for community feedback and participation by sending complaints and comments via the Internet.

Also, monitoring data are available in 'real time'. Cameras and instruments (such as noise monitoring equipment) can be established at project sites that stream data directly onto the Internet. Consequently, people are able to see and know what is happening at a project site as the events actually occur.

With traditional paper-based data collection and reporting, there is a considerable time lag between monitoring and communication of those results. This means that, if an unacceptable impact is occurring, it may be a long time before appropriate mitigation measures are put in place to address it.

In a high-density environment like Hong Kong, this would be unacceptable, with the local community suffering adverse impacts on their quality of life — for instance, noise impacts from a construction site (Au, 2001). This example shows how EIA regulators can improve the practice of EIA follow-up by enhancing such outcomes as increased public involvement in EIA and follow-up activities.

Framework for EIA follow-up

Baker and Dobos (2001) reported on a recent initiative by Environment Canada to develop an environmental assessment follow-up framework after follow-up was identified as a weakness in Canadian EIA. Under the Canadian Environmental Assessment Act, follow-up is defined as a programme for verifying the accuracy of the environmental assessment of a project, and determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project.

For the purposes of its framework, Environment

Canada has added the following to the above definition: follow-up is also a programme for verifying that mitigation measures are implemented, and that follow-up is a programme that assists in the management of environmental issues that are identified by the follow-up programme. Proposed changes to the Act will strengthen the role of EIA follow-up in three main ways:

- Responsible Authorities will be required to ensure that a follow-up programme is conducted for projects that have undergone a comprehensive study;
- Responsible Authorities will be required to consider whether follow-up programmes are appropriate for screenings they are conducting; and
- Responsible Authorities will be able to request assistance from federal authorities (including Environment Canada) to ensure the implementation of a follow-up programme on which they have agreed.

To meet these new requirements for EIA follow-up, Environment Canada has been developing a framework that will guide practices and procedures to be followed by their staff. Although designed for use by Environment Canada, this framework approach could easily be incorporated into practices elsewhere.

The follow-up framework involves several steps, to be followed in sequential order:

- screening projects to determine the need for follow-up;
- design and implementation of the follow-up programme;
- evaluation of the follow-up results;
- management of the follow-up issues; and
- reporting of the follow-up programme results.

Previously Arts *et al* (2001) noted that screening and scoping for follow-up should be undertaken early in the EIA process to identify follow-up requirements. This adds value to the EIA process by only requiring follow-up programmes for projects, or for specific aspects of projects, that warrant them.

The screening criteria developed by Environment Canada provide a simple but effective and consistent approach for determining the need for EIA follow-up. They are presented in Table 1 and consist of a series of questions with yes/no answers. A 'yes' response to any one, or combination, of these questions may suggest the need for EIA follow-up. However Baker and Dobos (2001) note that the final decision may still involve professional judgement.

The remaining steps in the follow-up framework (listed previously) are also being developed. Given that many of these are specific to Environment Canada procedures they are not covered further here.

Having developed a draft EIA follow-up framework, the next step for Environment Canada is to revise and improve the system. This will include, for example, refinement of the screening criteria

Table 1. Screening criteria for EIA follow-up developed by Environment Canada

<ul style="list-style-type: none"> • Does the project involve new or unproven technology? • Does the project involve a new or unproven mitigation measure? • Is an otherwise familiar or routine project being proposed for a new or unfamiliar setting? • Is the project proposed for an environmentally sensitive ecosystem? • Is the assessment's analysis based on a new assessment technique or model? • Has the project scheduling, design or implementation changed from the original EIA such that adverse environmental effects could result? • Is there considerable and reasonable public concern about the effects of the project on the environment, or the environment on the project? • Has an adaptive management approach been proposed? • Are there any cumulative effects predicted? • Is the project proposed by a new or inexperienced proponent, or a proponent with a history of known non-compliance? • Have other government departments indicated the need for a follow-up programme?
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Source: Baker and Dobos (2001)

suggested in Table 1. Specifically, consideration will be given to whether the criteria should be weighted when used in the screening process (Baker and Dobos, 2001).

Lessons learned

The workshop presentations and ensuing discussions highlight some valuable lessons on EIA follow-up which correspond to, and substantiate, the conclusions from previous workshops (see Arts *et al.*, 2001). They can be summarised as follows:

- the chief purpose (and outcome) of EIA follow-up is for project and environmental management; that is, to avoid or minimise adverse effects on (local) ecosystems and communities;
- simple but effective techniques can be employed in EIA follow-up as the examples of screening criteria, simple monitoring using human senses, and environmental management tools developed by ScottishPower have demonstrated;
- EIA follow-up may be initiated by proponents, regulators or the public: the three stakeholder interests are often intertwined and their combined interest or pressure may initiate follow-up programmes and each stakeholder may benefit directly from EIA follow-up programmes;
- EIA follow-up can provide clear benefits for proponents as the ScottishPower and the Ecuador gas-well examples demonstrate: hence proponents may be motivated to undertake EIA follow-up even when there is no legislative requirement to do so;

- EIA follow-up provides the link between EIA and EMS and the implementation of mitigation measures to protect and manage the environment;
- public participation in EIA follow-up is valuable for the proponent, community and regulators alike and can be enhanced through electronic communication technology; and
- EIA follow-up is particularly important in cumulative effects situations: from the community perspective, the environmental performance of a single industry is of minimal concern; the public is only really interested in the cumulative outcome or performance; follow-up is essential for determining both cumulative effects and the contribution of individual projects to cumulative environmental change.

Overall, EIA follow-up provides an opportunity to improve not only the management of individual projects but also the future practice of EIA.

Future workshops on EIA follow-up are planned commencing with the IAIA'02 conference in the Netherlands in July 2002. A network of EIA follow-up practitioners on the Internet (hosted by Environmental Canada) is also available at: <http://ea-ee.ncr.ec.gc.ca/fup/login.asp> and CD ROMs of both the IAIA'00 and IAIA'01 follow-up workshops have been produced (Environment Canada, Environmental Assessment Branch, 2000; 2001).

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