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Monitoring, Follow-Up, Adaptive Management and Quality Assurance

Prepared for: Expert Panel – Review of Environmental Assessment Processes

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I. INTRODUCTION

The Canadian Environmental Assessment Agency describes environmental assessment (EA) as “a *process* to predict environmental effects of proposed initiatives before they are carried out.”¹ Generally speaking, the EA process contains the following steps:

1. Identification of potential adverse environmental effects;
2. Identification of measures to mitigate adverse environmental effects;
3. Predictions as to whether there will be significant adverse environmental effects, after mitigation measures are implemented; and
4. Identification of a follow-up program(s) to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures.²

This discussion paper focuses on the last of the above-noted steps (4. Follow-up programs), which essentially entails the design and implementation of a program(s) to monitor and report on the environmental effects of a project. The paper also considers what could be described as a very particular type of follow-up program, *i.e.* adaptive management, which the Canadian Environmental Assessment Agency (Agency) has characterized as “a planned and systematic process for continuously improving environmental management practices by learning about their outcomes.”³ Finally, this paper considers mechanisms for verifying and improving the quality of federal EA, *i.e.* quality assurance programs.

The paper is organized as follows. Part II sets out the manner in which monitoring, follow-up, adaptive management, and quality assurance were treated under both the previous and current *CEAA* regimes.⁴ Part III then considers the federal government’s track record with respect to those elements, as well as related audits and research. Part IV sets out our recommendations for a future federal EA regime.

¹ Canadian Environmental Assessment Agency Website: <<https://www.canada.ca/en/environmental-assessment-agency/services/environmental-assessments/basics-environmental-assessment.html>>.

² *Ibid.*

³ Government of Canada, Canadian Environmental Assessment Agency, (2009), *Operational Policy Statement Adaptive Management Measures under the Canadian Environmental Assessment Act*, Ottawa: Government of Canada, available online at <http://www.ceaa.gc.ca/default.asp?lang=En&n=50139251-1>> (“Operational Policy Statement”).

⁴ *Canadian Environmental Assessment Act, 1992*, SC 1992, c-37 [CEAA, 1992] and *Canadian Environmental Assessment Act, 2012*, SC 2012, c-19 [CEAA, 2012].

II. MONITORING, FOLLOW-UP, ADAPTIVE MANAGEMENT AND QUALITY ASSURANCE

A. *Canadian Environmental Assessment Act, 1992*

CEAA, 1992 defined “follow-up program” as a program for “(a) verifying the accuracy of the environmental assessment of a project, and (b) determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project.”⁵ “Mitigation”, in turn, was defined as “the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.”⁶

From these definitions, it follows that “follow-up programs” are essentially programs for monitoring and analysing the environmental effects of a project with two distinct objectives: (i) to determine whether the predictions made in the EA were accurate (presumably with a view towards improving EA practice); and (ii) to determine if any required mitigation measures are functioning effectively (presumably with a view towards potentially requiring corrective measures).

Effective environmental monitoring is generally understood as resource-intensive.⁷ It is therefore not surprising that *CEAA, 1992*, which applied to several thousands of projects annually but offered several tiers of assessment,⁸ did not require follow-up programs in all instances but rather for what could be described as major resource projects, *i.e.* those on the *Comprehensive Study List Regulations*⁹ and those that were referred to mediation or panel reviews.¹⁰ Additionally, under *CEAA, 1992*'s self-assessment model, the implementation of follow-up programs was the responsibility of the responsible authorities (RAs) whose decision-making power triggered the *CEAA, 1992* process in the first place,¹¹ and the details of follow-up programs would generally be found in a statutory instrument of some kind (*e.g.* a *Fisheries Act* subsection 35(2) authorization for impacts to fish habitat or a *National Energy Board Act* section 52 certificate of public convenience and necessity).

Under *CEAA, 1992*, whether or not a follow-up program was required (and its contents) could be ascertained from the Canadian Environmental Assessment Registry (CEA Registry).¹² Pursuant to subsection 55.1(2), the public registry file for any given project was required to contain:

- (s) a notice stating whether or not...a follow-up program for the project is considered appropriate;
- (t) a description summarizing any follow-up program and its results or an indication of how a full description of the program and its results may be obtained.

⁵ *CEAA, 1992*, s 2.

⁶ *Ibid.*

⁷ For a general discussion about monitoring, see Martin Olszynski, “Environmental Monitoring and Ecosystem Management in the Oil Sands: Spaceship Earth or Escort Tugboat?” (2014) 10 McGill J.S.D.L.P. 1-44 and the references cited therein.

⁸ *CEAA, 1992*, s. 14 and s. 38.

⁹ SOR/94-638.

¹⁰ *CEAA, 1992* subs. 16(2).

¹¹ *CEAA, 1992*, s. 38.

¹² *CEAA, 1992*, s. 55.

In other words, the public registry file did *not* need to contain *the details* of any required follow-up program, nor the monitoring data submitted by proponents pursuant to its terms. That being said, such information was supposed to be collected as part of the Agency's internal "project files". Pursuant to subsection 55.4(2), project files were required to contain:

- (a) all records included in the Internet site;
- (b) any report relating to the assessment;
- (c) any comments filed by the public in relation to the assessment;
- (d) *any records relating to the need for, design of or implementation of any follow-up program*; and
- (e) any documents requiring mitigation measures to be implemented.

In other words, *CEAA, 1992* explicitly contemplated an informational gap between the public CEA Registry and the Agency's own internal project files. Although time has not permitted research into the rationale behind this gap, some indication can be derived from the inclusion in *CEAA, 1992* of a series of rules, with reference to the federal *Access to Information Act*,¹³ setting out which records had to be made publicly available.¹⁴ Most of these rules referred to third party information (e.g. monitoring data provided by an environmental consultant company on behalf of a proponent) and the circumstances in which such records could be disclosed. As a general matter, such records were not to be disclosed where they have been treated as confidential by the generating third party or where doing so could have resulted in financial loss or gain to a third party, subject always to public interest exceptions. Importantly, and as further discussed below, third parties could always waive these restrictions and consent to the release of their information.

With respect to adaptive management, *CEAA, 1992* made only a cursory, undefined reference to that term in subsection 38(5): "The results of follow-up programs may be used for implementing adaptive management measures or for improving the quality of future environmental assessments." Nevertheless, in a 2008 decision,¹⁵ the Federal Court held that adaptive management was a "guiding tenet" in the interpretation of Act,¹⁶ and that it "permits projects with uncertain, yet potentially adverse environmental impacts to proceed based on flexible management strategies capable of adjusting to new information regarding adverse environmental impacts where sufficient information regarding those impacts and potential mitigation measures already exists."¹⁷

At the time, this decision was widely criticized. Professor Arlene Kwasniak argued that the Court's approach "[ran] contrary to the *CEAA* for numerous reasons," including the relatively minor role for adaptive management envisioned by the legislation (as noted above).¹⁸ She also underlined how *CEAA, 1992* did not contemplate reliance on adaptive management as a "substitute for committing to specific mitigation measures."¹⁹ Accordingly, it was not meant to be

¹³ R.S., 1985, c. A-1 [ATIA].

¹⁴ *CEAA, 1992*, subsections 55.5 (1) – (3).

¹⁵ *Pembina Institute for Appropriate Development v Canada (Attorney General), Pembina Institute for Appropriate Development v Canada (Attorney General)*, 2008 FC 302 [Pembina Institute].

¹⁶ *Ibid* at para 33.

¹⁷ *Ibid* at para 32.

¹⁸ Arlene Kwasniak, "Use and Abuse of Adaptive Management in Environmental Assessment Law and Practice: A Canadian Example and General Lessons," Vol. 12, No. 4 (2010/11) *Journal of Environmental Assessment Policy and Management*, 425, at 450.

¹⁹ Operational Policy Statement, *supra* note 3 at 4.

used “to cover a situation where a proponent is not sure how to mitigate a negative environmental impact, but commits to finding the technology or science in the future, if a problem arises.”²⁰ Similarly, Professor Nathalie Chalifour pointed out that the Court’s approach rendered “virtually meaningless” the statutory requirement that, to be considered, mitigation measures must be “technically and economically feasible.”²¹ She also expressed doubts about its consistency with the statutory requirement to apply the precautionary principle: “A precautionary approach would place the onus on Imperial Oil to demonstrate that [mitigation measures were] sufficient to ensure that they would not cause serious environmental impacts.”²² Reflecting on the absence of any detailed discussion surrounding the proposed application of adaptive management by the panel, Professor Martin Olszynski suggested that in such instances “there would be little to no basis for concluding that the uncertainty associated with proposed mitigation measures will actually be reduced, let alone that these measures will prove effective...”²³ As further discussed in the next part, none of these problems have been addressed, while in the meantime the purported application of adaptive management has become ubiquitous; a recent survey of the CEA Registry revealed that 91% of the projects listed there contained at least one reference – and usually several – to adaptive management.²⁴

Finally, with respect to quality assurance, section 56.1 of *CEAA, 1992* was added in 2003 and required the Agency to establish a quality assurance program.²⁵ As noted by the Commissioner for the Environment and Sustainable Development (CESD) in a subsequent (2009) audit, such a program “could provide critical analyses of issues such as...the scoping of a project, the quality of environmental assessment reports, and the implementation of mitigation measures. This could build the groundwork for corrective actions to be identified and implemented.”²⁶ Unfortunately, and as further discussed below, as recently as 2009 the Agency had still not implemented a cohesive quality assurance program, with *CEAA, 1992* being repealed and replaced three years later by *CEAA, 2012*, which contains no quality assurance provisions.

B. Canadian Environmental Assessment Act, 2012

CEAA, 2012 contains many of the same elements as *CEAA, 1992*, but there are also some significant differences. The definitions for follow-up programs and mitigation are the same, but *CEAA, 2012* makes no reference to adaptive management or a quality assurance program whatsoever (although both proponents and the agency continue to rely on adaptive management, as noted above).

²⁰ Arlene Kwasniak, *supra* note 18, at 427.

²¹ Nathalie J. Chalifour “Case Comment - A (Pre)Cautionary Tale about the Kearl Decision” (2009) 5:2 McGill JSDLP 251 at 280. *CEAA, 2012* s 19 sets out this and other requirements.

²² *Ibid* at 281.

²³ Martin Olszynski, “Adaptive Management in Canadian Environmental Assessment Law: Exploring Uses and Limitations” (2010) 21 J. Env. L. & Prac. 1. at 3.

²⁴ These projects are listed on the Canadian Environmental Assessment Registry: <<http://www.ceaa.gc.ca/050/index-eng.cfm>>. The 91% figure is based on a search of projects on the registry conducted by Professor Olszynski in August 2015, which yielded 60 such projects. This number was then divided by the average total number of active projects on the registry in the preceding three years (66).

²⁵ *CEAA, 1992*, s. 56.1 “Federal authorities and persons and bodies referred to in sections 8 to 10 shall, if requested to do so by the Agency, provide the Agency with any information respecting the assessments whose conduct they ensure under this Act that the Agency considers necessary in support of a quality assurance program that it establishes.”

²⁶ *Infra* note 30.

In addition, because *CEAA, 2012* essentially only applies to major resource projects (designated projects),²⁷ follow-up programs are required in every instance. The details of follow-up programs must now be set out in “Decision Statements” under the Act, though presumably they also could be reflected in subsequent regulatory permits or approvals.²⁸ There have also been some changes to the CEA Registry provisions. Information with respect to follow-up programs is no longer explicitly referred to, but this is likely a reflection of the fact that these are now included in the Decision Statement for any given project. The rules with respect to disclosure appear to have been simplified somewhat but still mostly incorporate the third party record rules of the *ATIA*.

III. ASSESSING FEDERAL PERFORMANCE

A. Monitoring and Follow Up: A Poor Track Record

For the purposes of this paper, Professor Olszynski reviewed all publicly available CESD audits related to monitoring. Only one audit (2009) directly focused on the implementation of *CEAA, 1992*.²⁹ It found that the Agency had established the CEA Registry³⁰ and that “project files” were created “for most environmental assessments” (all comprehensive studies and all panel reviews were complete, but information with respect to 20% of screenings was not posted in a timely manner).³¹ As noted in the preceding section, however, it also found that the Agency had not fully established the quality assurance program required by the 2003 amendments to the Act: “There [was] no clear framework, strategic direction, targets, or performance measures.”³²

There were no audit findings reported with respect to the quality of the monitoring data and follow-up programs contained within the Agency’s project files. However, because under *CEAA, 1992* the implementation of follow-up programs was the responsibility of RAs, some sense of their implementation can be gleaned from the CESD audits of those RAs in their related regulatory roles. In the same year that the CESD audited *CEAA, 1992*, it also audited Fisheries and Oceans Canada’s (DFO) implementation of its fish habitat protection program.³³ The CESD’s findings were troubling in several respects:

1.38 Proponents are normally required to carry out project monitoring activities, and the Department may monitor projects directly or rely on monitoring by the proponent. We found that the Department does not have a risk-based approach to monitoring proponents’ compliance with the terms and conditions of ministerial authorizations... For example, we found that proponents had carried out the required monitoring in only 6 of 16 (38 percent) sample items involving ministerial authorizations... Further, the Department directly monitored the proponent’s compliance in only one of the cases we reviewed. We found no documentation to

²⁷ *CEAA, 2012*, s 13.

²⁸ *CEAA, 2012*, s 31.

²⁹ 2009 Fall Report of the Commissioner of the Environment and Sustainable Development Chapter 1—Applying the Canadian Environmental Assessment Act, available online at: http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200911_01_e_33196.html#hd5I

³⁰ *Ibid* at 1.53.

³¹ *Ibid* at 1.55.

³² *Ibid* at 1.59.

³³ 2009 Spring Report of the Commissioner of the Environment and Sustainable Development, Chapter 1—Protecting Fish Habitat, available online: http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200905_01_e_32511.html#hd5g

show that the Department had followed up or evaluated the effectiveness of its decisions—that is, whether implementing the conditions of the ministerial authorizations...had resulted in no net loss of habitat.³⁴

More recently, the CESD concluded that compliance tracking efforts by the National Energy Board (NEB), an RA under *CEAA, 2012*, were also “inadequate.”³⁵ Of relevance to this paper were the findings that the NEB had only “tracked condition implementation adequately in 25 of the 49 cases.”³⁶ In those 25 instances, “the Board had updated its tracking records, had received and recorded submissions provided by the company, and had documented its analysis and final conclusion as to whether the condition had been implemented to the Board’s satisfaction.”³⁷ In the remaining 50% of cases, however, “the conditions had not been adequately tracked and documented. The type of inadequacies varied: the Environment and Safety Information Management System...was out of date or inaccurate; Board analysis or conclusion on company compliance was missing; or the desired end result of a condition had not been achieved or properly documented.”³⁸ The CESD concluded that the NEB “faced significant, system-wide challenges with the information management tools it used to track company compliance.”³⁹ With respect to public access to information on compliance, the audit found that the NEB had taken steps to improve such access, but that this was being “hindered by the way the information was presented.”⁴⁰ Ultimately, the CESD recommended that the NEB “provide the public with improved access to information about company compliance with pipeline approval conditions” by ensuring “that its website incorporates a user-centered design that the public can access and use efficiently.”⁴¹

Other monitoring-related audits have consistently revealed weaknesses in federal efforts. In a 2010 audit of Environment Canada’s monitoring of water resources,⁴² the CESD concluded that “Environment Canada is not adequately monitoring the quality and quantity of Canada’s surface water resources... The Department has not established many of the essential management practices needed to plan, implement, assess, and improve its long-term monitoring programs... As a consequence, the Department has no objective basis on which to identify opportunities for improvement or take corrective actions to improve these programs.”⁴³ Similarly, a 2011 audit focusing on the assessment of cumulative effects of oil sands projects found “[i]ncomplete environmental baselines and environmental data monitoring systems needed to understand changing environmental conditions in northern Alberta.”⁴⁴ This latter audit preceded the launching of not one but two expert panels, one federal and one provincial, into the quality of

³⁴ 2010 Fall Report of the Commissioner of the Environment and Sustainable Development Chapter 2—Monitoring Water Resources, available online at: http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201012_02_e_34425.html.

³⁵ 2016 Fall Report of the Commissioner of the Environment and Sustainable Development, Chapter 1, available online: http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201601_02_e_41021.html

³⁶ Ibid at 2.29

³⁷ Ibid

³⁸ Ibid at 2.30.

³⁹ Ibid.

⁴⁰ Ibid at 2.55 – 2.56.

⁴¹ Ibid.

⁴² Ibid.

⁴³ Ibid.

⁴⁴ 2011 October Report of the Commissioner of the Environment and Sustainable Development Chapter 2—Assessing Cumulative Environmental Effects of Oil Sands Projects, online at: http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201110_02_e_35761.html

monitoring in Alberta's oil sands region, both of which concluded that then-current monitoring efforts were seriously deficient.⁴⁵

Importantly, this phenomenon is not restricted to the federal government but rather appears to plague most government agencies and departments. In addition to the above-noted findings of the Alberta Environmental Monitoring Panel, a 2011 audit of BC's Environmental Assessment Office's (EAO) concluded that the EAO's "oversight of certified projects is not sufficient to ensure that potential significant adverse effects are avoided or mitigated. Specifically, the EAO is not ensuring that: certificate commitments are measurable and enforceable; monitoring responsibilities are clearly defined; and compliance and enforcement actions are effective."⁴⁶ The audit also found that the EAO was "not evaluating the effectiveness of environmental assessment mitigation measures to ensure that projects are achieving the desired outcomes," not was it "making appropriate monitoring, compliance and outcome information available to the public to ensure accountability."⁴⁷ Most recently, Ontario's Auditor General also concluded that the province's Ministry of Environment "does not have effective processes to ensure that projects are implemented as planned. Such processes could include field inspections during project implementation or requesting data, after projects are implemented, that shows their environmental impact."⁴⁸

B. Adaptive Management and Quality Assurance: A Failure to Implement

As noted in the previous part, *CEAA, 1992* made only a cursory reference to adaptive management, and then only in regards to follow-up, while *CEAA, 2012* makes no reference whatsoever. Nevertheless, where the effectiveness of a given mitigation measure seems uncertain, proponents continue to invoke adaptive management in an effort to satisfy the Agency or other RAs that their project will not result in significant adverse environmental effects.

As stated earlier, in its 2009 Operational Policy Statement, the CEA Agency described adaptive management as "a planned and systematic process for continuously improving environmental management practices by learning about their outcomes."⁴⁹ While definitions vary at the margins, there is a general consensus that adaptive management involves the following six-step cycle,⁵⁰ with each step consisting of several sub-steps:

⁴⁵ Liz Dowdeswell et al, *A Foundation for the Future: Building an Environmental Monitoring System for the Oil Sands* (Oilsands Advisory Panel, 2010); Alberta Environmental Monitoring Panel, *A World Class Environmental Monitoring, Evaluation and Reporting System for Alberta* (Edmonton: Alberta Environmental Monitoring Panel, 2011), online at <<http://environment.gov.ab.ca>>.

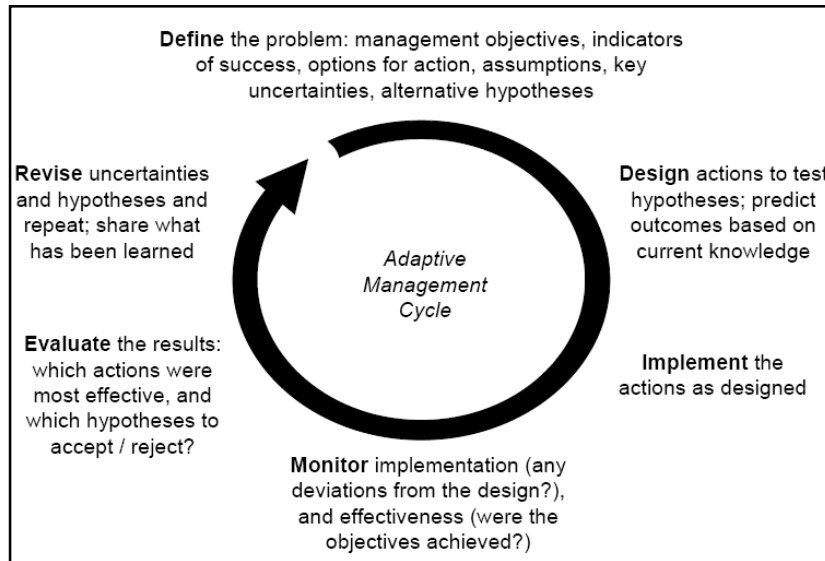
⁴⁶ Auditor General of British Columbia, "An Audit of the Environmental Assessment Office's Oversight of Certified Projects" (2011), online: <<http://www.bcauditor.com/pubs/2011/report4/audit-bc-environmental-assessment-office-EAO>>.

⁴⁷ *Ibid.*

⁴⁸ Auditor General of Ontario, 2016 Annual Report, online at: <<http://www.auditor.on.ca/en/content/annualreports/arbyyear/ar2016.html>>.

⁴⁹ Government of Canada, Canadian Environmental Assessment Agency, *Operations Policy Statement Regarding Adaptive Management*, *supra* note 3.

⁵⁰ C. Murray & D.R. Marmorek, "Adaptive Management: A spoonful of rigour helps the uncertainty go down" (2004) in *Proceedings of the 16th Annual Society for Ecological Restoration Conference*, Victoria, B.C.



While a detailed discussion about the theory of adaptive management is beyond the scope of this paper, a few additional comments are warranted (in addition to those provided in Part II).⁵¹ First and most importantly, adaptive management is not “fail-safe”⁵²: “no form of adaptive management, no matter how rigorous, can guarantee successful resource protection... Adaptive management can help us recognize management mistakes and limit the damage they cause... But it does not prevent mistakes, nor does it guarantee that the mistakes we make will be reversible.”⁵³ Second, adaptive management is not a *panacea*: there are environmental problems for which adaptive management is not suitable.⁵⁴ In fact, several prominent U.S. scholars now suggest that it is probably not appropriate for most environmental problems.⁵⁵ Ideal conditions for adaptive management have been described as those where the “management-problem context presents a dynamic system for which uncertainty and controllability are high and risk is low.”⁵⁶ Finally, in order to be effective adaptive management must be fully and rigorously implemented: “If the management actions are implemented in a way that strays from the design, if the experimental design does not isolate the signal of interest from background noise (through spatial/temporal contrasts, replicates and controls), or if monitoring focuses on the wrong variables, scale or frequency, it will be difficult if not impossible to learn anything meaningful.”⁵⁷

⁵¹ Most of the following discussion borrows heavily from Martin Olszynski, “Failed Experiments: An Empirical Assessment of Adaptive Management in Alberta’s Energy Resources Sector” (2016) (currently under review and consideration for publication).

⁵² Grieg, L, and C. Murray. 2008. Peer Review of Rockfort Quarry Adaptive Management Plan. Prepared by ESSA Technologies Ltd., Richmond Hill, ON, for Caledon Coalition of Concerned Citizens, Terra Cotta, ON. 12 pp. at 6. Rather, these authors describe adaptive management as “safe-fail”, *i.e.* it should only be applied when failure is an acceptable outcome.

⁵³ Holly Doremus, Adaptive Management, the *Endangered Species Act*, and the Institutional Challenges of “New Age” Environmental Protection, 41 WASHBURN L.J. (2001) 50 at 52 53.

⁵⁴ Holly Doremus, “Adaptive Management as an Information Problem” 89 *N.C. L. Rev.* 1455 (2010) at 1458.

⁵⁵ R.K. Craig and J.B. Ruhl, “Designing Administrative Law for Adaptive Management,” 67 *Vanderbilt Law Review* 1 (2014) at 7; Eric Biber, “Craig and Ruhl’s Model Adaptive Management Procedures Act: Proposed Amendments” 51 *Idaho L. Rev.* 257 (2014) at 258.

⁵⁶ Craig and Ruhl, *ibid* at 19.

⁵⁷ Marmorek and Murray, *supra* note 50.

Unfortunately, there is considerable divergence between the theory and practice of adaptive management. In a 2010 article, American scholars J.B Ruhl and Robert Fischman observed that “agencies in practice have employed what we call “a/m-lite,” a stripped-down version of adaptive management that almost always neglects to develop testable hypotheses... Furthermore, lack of follow-through plagues implementation. This a/m-lite approach, in its most extreme form, is open-ended contingency planning or ‘on-the-fly’ management that promises some loosely described response to whatever circumstances arise.⁵⁸ Similarly, Professor Holly Doremus has observed that while enthusiasm for adaptive management in the U.S. abounds, “[w]hen it comes to implementation...skepticism becomes the rule. Documented instances of successful adaptive management are rare, and many touted examples diverge significantly from the theoretical ideal.”⁵⁹ In Australia, there is a general sense that “the rhetoric of adaptive management has been used to justify the approval of projects with uncertain environmental impacts.”⁶⁰

Professor Olszynski has recently completed the first empirical assessment of adaptive management in Alberta’s energy resources sector (e.g. coal mines, oil sands mines and *in situ* oil sands developments).⁶¹ He found that, as applied in this context, adaptive management suffers from most – if not all – of the shortcomings identified above. At the EA stage, which for both the coal mines and oil sands mines considered usually included a CEAA joint review panel, **adaptive management has erroneously been cast as a routine and fail-safe strategy that will ensure the effective mitigation of any and all adverse environmental effects.** Virtually no attention was paid to experimental design (i.e. the selection of objectives, indicators, uncertainties and hypotheses; see figure above), nor was consideration given as to whether adaptive management was even an appropriate response to the problem for which it was being proposed (e.g. end-pit lakes). At the approval stage, there was a significant gap in terms of the number and kinds of issues for which adaptive management was required compared to those for which it was proposed by the proponent. Where it was required, approval terms were generally vague and ambiguous; none required the preparation of a detailed adaptive management plan. Finally, at the reporting stage, implementation was generally poor: it was non-existent for the oil sands mines considered, while coalmines and *in situ* developments demonstrated some implementation but were beset by various other deficiencies, including vague and unenforceable triggers, and the conflation of adaptive management with mere compliance (e.g. directive-based noise levels) or performance (policy-based) monitoring. While such monitoring is useful and important in its own right, it is not adaptive management: it is generally too coarse (e.g. annual monitoring frequency, which is insufficient to isolate the signals of interest from background noise) and focused on the wrong indicators (e.g. the number of lights with mitigation as opposed to the effects of light pollution on wildlife in the area).

With respect to quality assurance, we have already noted the CESD’s 2009 finding that the Agency had failed to fully implement its quality assurance program, which in 2012 was cancelled outright. This is not to say that no work was done on this front – several studies and

⁵⁸ J.B. Ruhl and Robert Fischman, “Adaptive Management in the Courts” (2010) 95(2) Minnesota Law Review at 441. This assessment was mostly unchanged following a recent (2015) reappraisal of the caselaw.

⁵⁹ Doremus, *supra* note 54 at 1457.

⁶⁰ Jessica Lee, “Theory to Practice: Adaptive Management of the Groundwater Impacts of Australian Mining Projects” (2014) 31 Environmental Planning LJ 251 at 251.

⁶¹ Olszynski, *supra* note 51.

reports are available on the Agency's website that should be considered as part of this review,⁶² including the following:

- Effectiveness of the Environmental Assessment Track Process under the *Canadian Environmental Assessment Act* (2010)
- Federal Screenings: An Analysis based on Information from the Canadian Environmental Assessment Registry Internet Site (2007)
- Public Participation in Screenings: An Analysis of Efforts made to Obtain Information and Views of the Public during the Conduct of Screenings (2009)
- Report on the Evaluation of the Substitution of the National Energy Board Review Process for the Emera Brunswick Pipeline Project (2009)

To reiterate the CESD's findings, however, no reports appear to have been prepared with respect to the most important aspects of EA, including the accuracy of EA predictions, the implementation of mitigation measures, or their effectiveness.

IV. RECOMMENDATIONS

In light of the foregoing, we make the following recommendations with respect to monitoring, follow-up, adaptive management, and quality assurance under a future federal EA regime. A common theme across all of these elements is the need for more legislative guidance, especially with respect to adaptive management and quality assurance programs. Another common theme is the need to increase transparency and facilitate public involvement – as recommended by almost all of the audits discussed above. Finally, and relatedly, the foregoing discussion makes plain the value of engaging independent agencies (e.g. auditor generals) to scrutinize EA practice, although the apparent failure by departments to actually implement recommendations suggests that additional tools are required.

A. Monitoring and Follow-Up

With respect to monitoring and follow-up reports, a future federal EA regime should eliminate the gap between the publicly available information on the CEA Registry and the Agency's own internal project files. Making all monitoring data and follow-up reports (where applicable) publicly available and easily searchable can be expected to improve their quality and restore public trust. This will also require amendments to the *ATIA*-related provisions of the current Act but should pose no significant difficulties; we can think of no compelling argument for why environmental monitoring data should be treated as confidential as a matter of course. At the very least, the general rule should be that monitoring data and follow-up reports are deemed public records unless the proponent can satisfy a strict test and the public is notified accordingly.

In addition, the Act should set out the basic conditions that must be stipulated with respect to monitoring: who will conduct monitoring, monitoring timelines, and reporting requirements. The legislation, or perhaps a subordinate regulation, could also set out minimum standards and acceptable methods for quantifying environmental conditions prior to disturbance (baseline data). The baseline data should be referenced in EAs, conditions in regulatory approvals, and in follow-up programs to enable more accurate monitoring for changes, and to inform adaptive

⁶² See <<http://ceaa-acee.gc.ca/default.asp?lang=En&n=4431094E-1>>.

management programs.⁶³ Finally, the Act should permit and encourage community and Indigenous monitoring, or co-monitoring.⁶⁴

B. Adaptive Management

With respect to adaptive management, a future federal EA regime must include a legislative definition of adaptive management. For example:

A planned and systematic process that enables – without guaranteeing – the improvement of environmental management practices by learning about their outcomes, and includes a six-step cycle of (i) problem identification, (ii) plan design, (iii) plan implementation, (iv) plan monitoring, (v) evaluation of implementation, and (vi) adjustment based on monitoring results as per the plan, and further repetition of the cycle as required.

A future Act should also set out the circumstances or rules for when reliance on adaptive management may be allowed or may be required, bearing in mind that it is not a “fail-safe” process. For example and consistent with current Agency policy, reliance on adaptive management could be disallowed at the environmental effects determination stage where significant adverse environmental effects would be likely if the proposed mitigation measures (as part of an adaptive management plan) proved inadequate. Conversely, if a decision is made to allow a project with significant adverse environmental effects to proceed, adaptive management could be required in all instances where the effectiveness of the proposed mitigation is uncertain.⁶⁵ Where adaptive management is permissible or required, the Act should require discrete, enforceable, and peer-reviewed adaptive management plans. The Act should also set out the mandatory elements of such plans, including thresholds for adaptive management intervention and enforceable mechanisms to ensure that intervention is implemented. Finally, the Act should require the inclusion on the CEA Registry of all adaptive management plans and monitoring results (see Quality Assurance below).

C. Quality Assurance

With respect to quality assurance, the Act should spell out clearly the kinds of programs that will be developed and implemented. For example, there should be QAPs relating to:

- The accuracy of predictions in environmental assessment processes, including that no significant adverse environmental effects are likely;
- The effectiveness of mitigation measures imposed by Decision Statements, regulatory approvals, and non-federal jurisdictions where these are relied upon;
- The implementation and effectiveness of monitoring conditions and monitoring activities;
- The effectiveness of follow up programs;
- The effectiveness of adaptive management;
- The effectiveness of public participation and funding mechanisms;
- The effectiveness of Indigenous participation, policies, and practices;

⁶³ See Submission to the Expert Panel by Libero-Ero, October 27, 2016, Objective 5.

⁶⁴ Numerous Submissions by or on behalf of Indigenous groups advocate for such monitoring arrangements, for example the submissions by the BC Assembly of First Nations, December 15th 2016, M. J. Willard, November 17th, and Carol Crowe, October 19th, 2016. As well see the transcripts from the Indigenous workshops.

⁶⁵ This was basically the approach adopted by the Lower Churchill Hydroelectric Project Joint Review Panel.

- The effectiveness of harmonization or other multi-jurisdictional processes.

Bearing in mind the audits considered in this paper, as well as to avoid conflicts of interest or even the appearance of conflicts of interest, the Act should require that the above QAPs be conducted by an entity other than any of the RAs under the Act. The Act should establish an independent "Quality Assurance Body" (QAB) and provide it with the powers necessary to carry out its functions, including investigatory, audit, and ombudsman powers. Perhaps most importantly, the Act should require relevant federal authorities to comply with QAB directions for the improvement of future environmental assessments, monitoring, follow-up, and adaptive management.