

## SUBMISSIONS

By

THE CANADIAN ENVIRONMENTAL LAW ASSOCIATION

On

The Proposed Regulatory Policy Statement of the

Atomic Energy Control Board -

Deep Geological Disposal of High-Level Radioactive Waste  
in Crystalline (Plutonic) Rock:

Initial Regulatory Statement Concerning Concept Assessment Stage

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Canadian Environmental Law  
Association  
8 York Street, 5th Floor South  
Toronto, ON M5J 1R2

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## I. INTRODUCTION

The Canadian Environmental Law Association (CELA), founded in 1970, is a public interest environmental law organization committed to the enforcement and improvement of environmental laws.

CELA has for many years been involved in the nuclear regulatory process. Its staff provide legal advice and assistance to members of the general public on nuclear-related issues, and have previously made submissions to, among others, the federal government on the proposed Nuclear Control and Administration Act and the Ontario Select Committee on Hydro Affairs on "The Regulatory and Jurisdictional Framework Governing Uranium Mining and Milling". We are therefore pleased to have the opportunity to comment on Consultative Document C-71 ("Proposed Regulatory Policy Statement - Deep Geological Disposal of High-Level Radioactive Waste in Crystalline (Plutonic) Rock") which was released for public comment on 10 March 1982.<sup>1</sup>

## II. NUCLEAR WASTE DISPOSAL - A HISTORY<sup>2</sup>

There have been numerous proposals for the long term storage and disposal of high-level radioactive waste, including: changing by nuclear reactions toxic nuclides having a long half-life to nuclides having a short half-life; and disposing of the wastes in outer space or in the earth.

Three types of disposal sites in the earth have been suggested; namely: polar icecaps, the sea-bed and geological formations such as granite, shale or salt. A site which remains stable over millions of years and through which little or no water passes is essential.

Disposal deep underground in salt formations has been given serious consideration in the United States. In Canada, on the other hand, Atomic Energy of Canada Limited (AECL) has concentrated its research activities on disposal in plutonic rock formations and has ignored for the most part salt and shale formations.

The Atomic Energy Control Board (AECB) has the regulatory authority to deal with the management of radioactive waste but, to date, has licensed only short term storage facilities. The development by the AECB of its regulatory policy has been dependent on the technical expertise of AECL, the crown corporation which is also responsible for the promotion and sale of nuclear technology.

In 1972, an AECL radioactive waste management committee concluded that it would be desirable to store high-level radioactive waste in such a manner that it could be retrieved and reprocessed to recover plutonium at some future date.<sup>3</sup> In the same year, the AECB agreed that AECL would have the technical responsibility for the development of a retrievable waste storage site. The AECL subsequently carried out a design study which recommended, in 1974, the twin concepts of above ground interim storage in cannisters, and deep geologic emplacement for ultimate disposal.

Research on deep geologic disposal proceeded. However, in March 1977, in response to strong opposition based on irrefutable technical research, the federal Minister of Energy, Mines and Resources issued a restraining order prohibiting AECL from carrying out test drilling near the Southern Ontario town of Madoc. Immediately, in April 1977, the Department of Energy, Mines and Resources commissioned a group of three scientists to examine the subject of nuclear waste disposal. Its report, "The Management of Canada's Nuclear Wastes", is known as the Hare Report, after its Chairman, Dr. Kenneth Hare.

Little effort was made to structure the committee as a vehicle for public debate either among technically qualified experts or between experts and non experts.<sup>4</sup> Critics questioned the authors' expertise, their independence (one was a former vice-president of AECL), the lack of public hearings, and the fact that the report was completed in four months.<sup>5</sup>

The major criticism of the report was that it was biased toward nuclear expansion in its recommendation that the AECL research and development program be accelerated to demonstrate the feasibility of the safe disposal of radioactive waste in deep geologic formations.<sup>6</sup> A subsequent comment by A.M. Aikin, one of the authors, did nothing to dispel the argument that the report has an uncritical pro-nuclear tilt.

I recognize the tremendous pressures the regulatory agencies are under, but I appeal to them to stop trying to make the world perfect. Rather, they should make sure the good from our nuclear activities outweighs the bad by a good factor...I call on the AECB, even though it may not see it as its role, to speed up the setting of such regulations, to seek wider industrial, technical, and public consultation, and not to take the safest approach possible, but rather the best one.<sup>7</sup>

In the winter and spring of 1978, the AECL again faced opposition to test drilling, this time in Northwestern Ontario. Opponents objected that the decision to examine crystalline rock rather than salt or shale had no scientific basis, but appeared to be a politically motivated decision to relegate nuclear waste disposal to the sparsely populated areas of Northern Ontario with only a few votes at stake. Local citizens asked for public hearings and a plebiscite, and challenged the government's and AECL's definitions of adequate public information and of what constitutes community approval. They raised questions about the relationship between test drilling, site selection

for waste disposal, and site selection of plutonium re-processing plants.<sup>8</sup> Plans for test drilling in 1981-1982 near Massey and Kenora in Northern Ontario and Lac du Bonnet in Manitoba have produced similar public responses. The AECL seems to have changed its position that some form of community approval must be obtained before any part of the nuclear waste program, including test drilling, could proceed in an area. It seems to now hold that, as a federal crown corporation, it can use crown land without municipal approval.<sup>9</sup> It has also indicated that the next stage of the program is the construction of a pilot underground repository in Manitoba (home to AECL's Whiteshell Nuclear Research Division) that will approximate the conditions of an actual waste repository.<sup>10</sup>

Meanwhile, the AECB has further developed its regulatory policy towards waste management facilities. A 1975 report concerned short, intermediate, and long term storage facilities. It was emphasized that "all three were intended to provide retrievable storage, since there had been no demonstration of the long term integrity of any disposal facilities".<sup>11</sup>

However, in 1978, a further report enunciated three important principles, the first of which dismissed the intention of retrieval. "Once disposal had been accomplished, there was to be no provision in the design of the facility for returning to the waste to extract valuable materials such as plutonium".<sup>12</sup> Plutonium would have to be extracted before disposal, if at all. Critics of this change in policy argued that permanent disposal may be less safe if something goes badly wrong. However, surface disposal or retrievable disposal is costly.

The second principle states that the concept of disposal does not involve perpetual care over waste disposal sites.

The third principle stipulates no guarantee that waste emplaced in rock would forever be isolated from the biosphere. It would thus become necessary to specify what rates of

release of radioactive waste to be biosphere would be acceptable.

The 1978 AECB report also spelled out the sequence of events necessary for AECL to obtain a license for a waste disposal site. These were site approval, construction approval, licensing approval to emplace waste, and authorization to effect closure, with environmental and safety assessments to accompany each stage. The AECB was to produce guidelines setting out the condition under which each stage of the licensing would be approved.

### III. THE PROPOSED REGULATORY POLICY STATEMENT

In its regulation of nuclear facilities, the AECB normally reviews a design concept at the time of site selection. In the case of high-level radioactive waste disposal however, it has decided to review a disposal concept and to evaluate a concept assessment document prior to the selection of a particular disposal site. The concept assessment program is expected to be completed by the end of 1990.<sup>13</sup>

Some of the principles in the proposed Regulatory Policy Statement are based on earlier studies and reports from which public contribution had been excluded. These principles include:

- the focus on one method of disposal only, the crystalline rock disposal concept;
- the definition of disposal as the discarding of waste without the intention of retrieving it;
- the statement that monitoring after closure would technically not be necessary, though "social concerns" may require such monitoring;
- the acceptance of radioactive release into

the biosphere with the assurance that "radiation doses to members of the public, attributable to the existence of a repository, will be unlikely at any time to exceed a small fraction of the doses which would be received from natural background radiation".

The ability of members of the public to effectively address these and other principles and issues will depend in part on their ability to affect the terms of reference and procedures set forth in the Proposed Regulatory Policy Statement.

The AECB has invited written comments on the Policy Statement from the general public, special interest groups and the technical community. In the event that major revisions to the Statement are to be made, the AECB has stated that it will reissue the document for further comment. Given the the importance of this process in setting the terms of reference and procedures to be followed, we urge that public hearings be held by the Board so that the views of the public, industry, the AECB and all others on the terms of reference and procedures of the Regulatory Policy Statement can be debated in the widest possible forum.

We recommend therefore that there be public hearings by the Board on its Consultative Document C-71, "Proposed Regulatory Policy Statement: Deep Geological Disposal of High-Level Radioactive Waste In Crystalline (Plutonic) Rock: Initial Regulatory Statement Regarding Concept Assessment Stage", March 10, 1982. (Recommendation 1)

Omitted from the Proposed Regulatory Policy Statement are a number of items which should be regarded as essential in a discussion of an issue of such profound significance:



1. What is the amount of high-level waste anticipated for disposal?
2. Is reprocessing of waste anticipated before disposal is contemplated, and what if any are the likely effects on site selection if reprocessing takes place prior to disposal?
3. Is high-level waste disposal being given priority over the disposal of other radioactive wastes, and if so, why?
4. Are waste disposal costs calculated into estimates of the total costs of nuclear energy development in Canada? Who will assume those costs?

These questions raise the prior, and principal, issue for Canada. Will the public have an opportunity to comment on the assumption implied by the AECB proposals that nuclear development will be continued as a matter of governmental policy?

#### IV. PUBLIC PARTICIPATION IN THE NUCLEAR POLICY PROCESS

##### A. Public Evaluation of the Nuclear Power Option

In setting up a procedure for public involvement in the assessment of a waste disposal concept, the AECB appears to be moving towards a more "democratically open" model of regulation. However, the management of the nuclear waste disposal issue in the past has followed procedures that excluded in important instances almost all but officials of the nuclear industry. In the deliberations about methods of waste disposal, this is a very serious omission, since the proponent of nuclear development, the AECL, is at the same time responsible for research on the disposal of the ensuing waste. Basic directions have already been decided in the absence of open processes.<sup>14</sup>

A "democratic open model" has been followed only in very limited regional debates about specific nuclear and uranium developments, which are discussed below. But the public had no say in the original decision that has now given rise to the present dilemma of what to do with existing nuclear waste. That is, the public had little say when the decision was made to opt for nuclear reactors in the first place.

Now that this highly radioactive waste has been created, the public must not only participate in decisions regarding its disposal, but also in decisions about whether additional waste ought to be produced. It should not simply be assumed that a "solution" to the problem of existing waste can justify continued reliance on the nuclear option.

The extent to which further waste creation is tolerable or even desirable depends only in part on the degree of serious risk associated with its disposal. It is essential that an evaluation take place of the nuclear power option in comparison with other energy production and/or conservation strategies in order to gain a basis for determining what degree of disposal safety is needed as a minimum to justify further generation of high-level radioactive waste.

Until public evaluation of the nuclear power option has taken place, the Concept Assessment stage should involve consideration only of whether the waste disposal concept is the least bad permanent disposal option for existing waste. Whether the concept promises to be sufficiently acceptable to justify further waste generation can be decided only in the broader policy context.

Many groups, including CEIA, have frequently asked the Federal Government to hold a public inquiry to evaluate the nuclear power option.

The Government has argued in reply that, in addition to discussions in Parliament, several public inquiries have removed the need for a national inquiry: the Ontario Royal Commission on Electric Power Planning (Porter Commission), the Ontario Select Committee on Hydro, Federal Environmental Assessment Panels on the location of uranium refineries, an Ontario Environmental Assessment Board hearing on uranium mining expansion at Elliott Lake, the Cluff Lake Board of Inquiry on uranium mining in Saskatchewan (Bayda Commission), and the British Columbia Royal Commission of Inquiry into Uranium Mining (Bates Commission). However, this view that various inquiries have provided the public with adequate input is not shared by other informed observers.

Bruce Doern, an academic who has written extensively on nuclear policy in Canada, and who regards himself as "a sufficient political realist to believe that the nuclear option for Canada is a real and viable one", has nevertheless concluded:

While the recently completed Cluff Lake Inquiry and the ongoing Porter Commission hearings may suggest that further public inquiries are unnecessary and expensive, it is by no means clear that a major federal public inquiry will not be of public value in the near future. This is because existing inquiries, including the Porter Inquiry, have insufficient scope in their terms of reference, especially with regard to the economics of the industry and to the implications of nuclear power for Canada as a nation. They have, moreover, lacked the coherence or the degree of national public attention of the Berger inquiry, though the subject is as essential and critical as that which preoccupied the latter. In the business world, time is money. In the political world, time is everything, and there is much evidence to suggest that we have yet to see the last major public inquiries about Canada's energy options. Such an inquiry

would seem to me to be essential to shed the widest possible public light on AECL's advanced fuel cycle priorities and on the research priority decisions that will precede them. It would also be necessary to examine future waste management concepts and technologies.<sup>15</sup>

Three of the inquiries frequently cited by the Federal Government when dismissing the call for a public inquiry have been analyzed in a study for the Science Council of Canada by Liora Salter and Debra Salco.<sup>16</sup>

#### B. The Federal Environmental Assessment Review Process (EARP)

The Science Council study focusses on the EARP hearing on the building of a nuclear generating plant at Point Lepreau, New Brunswick. That hearing and other EARP decisions since, leave open the question of how EARP should be integrated into the decision-making process. The EARP process is advisory, and it remains to be seen whether a negative EARP evaluation would result in cancellation of a major project or simply in resiting or redesign of the project. The Point Lepreau case "was an extreme example of public education disguised as public participation", but in all EARP assessments, expectations are raised for those who testify that they are in part responsible for the final decisions. Yet the final decision may not be clearly based on the considerations addressed in the EARP process.

Governments, however, appear to assume the policy-making prerogative and set criteria that have little to do with environmental considerations. An inquiry, under these conditions, becomes a stage for playing out, but certainly not resolving, conflicts in expectations.<sup>17</sup>

### C. The Bayda Inquiry

The Bayda Inquiry, concerning uranium mining at Cluff Lake, Saskatchewan, had a broad mandate and innovative process, but it was highly dependent on information brought to the inquiry by the applicant, Amok Ltd.

With only one applicant, no strong regulatory agency and a few voluntary organizations, the inquiry had the trappings of an adversarial process, but lacked much of the substance of effective adversarial decision-making.<sup>18</sup>

Common to both the Point Lepreau and Bayda inquiries was the more fundamental criticism that both Saskatchewan and New Brunswick viewed nuclear related development as the key to economic growth. Critics have argued that this stance determined the decisions of the inquiries.<sup>19</sup>

### D. The Porter Commission

The Royal Commission on Electric Power Planning in Ontario, the Porter inquiry, was not originally set up to include in its investigation nuclear development, but ultimately incorporated both the nuclear debate and Ontario Hydro's past approach to nuclear development. Groups participating felt they had been part of an adequate assessment process. Yet, for various reasons, the Porter inquiry has had little effect. The mandate was too broad; the government and the nuclear industry pre-empted technical discussions, and avoided scientific questions; and there were jurisdictional problems in suggesting changes in nuclear regulation. The Porter Commission was expected by many to end nuclear controversy when that controversy was only beginning to surface in the public arena.

Despite five years of consideration and debate, there is little chance the Porter report will end the nuclear controversy in Ontario. Now pressure is building for a national inquiry,

although such an inquiry seems a remote possibility. To be sure, a national inquiry might address questions that the Porter inquiry could not, for much of the responsibility for energy policy and nuclear development rests with the federal government and its agencies. In short, if the Porter inquiry is taken to be the final inquiry in the process of consideration of electric power planning in Ontario, it has failed in its task, and this failure was inevitable.<sup>20</sup>

#### E. The Relation of Concept Assessment to Nuclear Policy

The invitation from the AECSB to comment on the Proposed Regulatory Policy Statement, and the provision that the Concept Assessment process will include a public hearing, represents an attempt by the Board to respond to criticisms of its past performance in relation to openness and public participation.

However, a public debate as part of the concept assessment process implicitly assumes a public agreement on the nuclear option. That public agreement has not been tested, the various regional issue debates notwithstanding. As we suggested earlier, assessment of a proposal for waste disposal involves questions about the amounts of waste to be generated, the possibility of reprocessing waste, the estimated costs and who is responsible for them, among others. These questions in turn raise the prior question of the future of the nuclear option.

Bearing in mind these questions, we are concerned as well about the function of the concept assessment process. Assessment performs a different function than planning. Assessment is an attempt to establish what is; planning to establish what might be. "If assessment is allowed to set the agenda for planning, then it may also set constraints on what alternatives are seen to be possible."<sup>21</sup>

The AECSB normally reviews a design concept (e.g., for a nu-

clear power plant) at the time of site selection, but is breaking with that process in the waste disposal case to carry out concept assessment before site selection. The process of concept assessment is not expected to be complete until 1990. The timing therefore delays the politically awkward site selection phase until the nuclear industry has passed through a period of "commercial difficulty" until the mid-1990's.<sup>22</sup>

The concluding section of a draft of the Government's internal "Inter-Agency Review of the Nuclear Power Industry" was leaked to the press in June, 1981. It addressed ways in which the domestic market for nuclear reactors can be improved. It noted that one of the factors which makes utilities increasingly reluctant to pursue the nuclear option is public concern about health and the environment. The problem of public opposition could be dealt with, the document suggests, through proper handling of the waste disposal issue.

A good example of possible positive action is in the area of radioactive waste management, which public opinion polls indicate is an important factor in public opposition to further nuclear expansion. It is also one of the areas in which public perceptions differ most sharply from the views of scientists and engineers to whom the waste disposal problem appears more easily amenable to solution than a large number of non-nuclear related environmental and safety problems.

The federal and Ontario governments, through AECL and Ontario Hydro, have an active program in spent fuel disposal. While still in an early stage, a considerable amount of information has been accumulated in the process of concept verification. One straightforward option, therefore, is to issue a clear indication of confidence by the government that the waste management question is on its way to solution, and at the same time providing increased funding of the waste disposal program to allow it to proceed at the technologically determined pace.<sup>23</sup>

We are unsettled by the possibility that the concept assess-

ment process is intended as "a clear indication of confidence by the government that the waste management question is on its way to solution." We are concerned that the process will pre-empt the long overdue public inquiry into whether the nuclear option is for Canada in social, political, environmental and economic terms the most acceptable option.

We recommend that concept assessment proceed for the disposal of existing waste only, and that a national public inquiry into the future of the nuclear option precede concept assessment of disposal of future waste. (Recommendation 2)

#### V. CONCEPT ASSESSMENT FOR THE DISPOSAL OF EXISTING NUCLEAR WASTE

The following comments about the Proposed Regulatory Policy Statement fall within the limits of Recommendation 2 that concept assessment should proceed only in order to find a "least bad" form of disposal for existing waste, and that a national public inquiry into the future of the nuclear option should precede concept assessment of methods of disposing of possible future waste.

##### A. Structures and Process for Concept Assessment

The AECB, as the primary regulatory authority, will state its views on the acceptability of the disposal concept, having reviewed a concept assessment document to be submitted by AECL. In formulating its decision about the acceptability of the concept, the AECB will "consult with" Environment Canada and the Ontario Ministry of the Environment through joint participation in an Interagency Review Committee (IRC). The AECB "will review the technical issues, especially as they relate to health, safety, security and the environment..." in consultation with the



other two members of the IRC. "Socio-economic considerations are subject to review by Environment Canada and the Ontario Ministry of the Environment, both of which have expertise in these areas..."<sup>24</sup> No information is given about the timing, process, or terms of reference for this review.

The Proposed Regulatory Policy Statement contains guidelines concerning the information on technical issues to be submitted by the AECL in its concept assessment document. It also includes examples of "a broad spectrum of topics" to be addressed in a public hearing to be held under federal auspices on socio-economic considerations. It states that "well in advance of this hearing, the responsible body will issue detailed guidelines regarding the content of submissions".<sup>25</sup> No information is given as to who the responsible body will be. It is stated that the AECB, in formulating its view on the acceptability or non-acceptability of deep-rock disposal "will ultimately take into account recommendations from a federally-sponsored public hearing on the developed concept."<sup>26</sup>

The establishment of the Interagency Review Committee may represent an attempt, in the handling of the waste disposal issue, to counter criticisms which have been made about the AECB's close relationships with the nuclear industry. The AECB has basic limitations resulting from Canada's commitment to state enterprises in the nuclear area.

The government itself and the nuclear enterprises it has created have a vested interest in nuclear expansion. Both AECL and Eldorado Nuclear, crown corporations responsible respectively for nuclear development and promotion, and uranium mining and refining, are responsible to the same Department of Energy, Mines and Resources as is the AECB, which regulates them. It is for this reason that we have often called for the replacement of the Atomic Energy Control Act with other legislation (see, for example, our

brief on the proposed Nuclear Control and Administration Act).

We have, therefore, serious misgivings about the structure and process as described. Not only is the "Proposed Regulatory Policy Statement" quite unclear, it also appears that in the final analysis, it will be the Department of Energy, Mines and Resources, to whom all are accountable, that will decide whether or not the proposed disposal method is acceptable, based on AECEB's technical review and the commercial ambitions of AECL and taking into account socio-economic reviews by the provincial and federal environment ministries and by a public hearing.

1. Criteria for a review body

Final authority for recommendations concerning disposal of existing waste should not rest with the AECEB, but with a more broadly representative body. One criteria for a review body is the representation of provinces with direct interest in the high level waste disposal issue. We are puzzled by the fact that the present Interagency Review Committee includes Ontario, but not Quebec or New Brunswick, both with nuclear reactors which will produce high level waste. It would also seem essential that Manitoba, the site of a pilot waste repository, should be represented.

A second criteria ought to be recognition of the interest of, and accountability to, members of the scientific community who are independent of the nuclear industry, of the medical profession, of environmental groups, of church groups, of labour unions, and of municipalities, among others.

A third criteria ought to be that the body would be a temporary one for the consideration of the disposal of existing high level nuclear waste only. New, and possibly integrated structures for the disposal of all forms of nuclear waste, and changes in the relationship of the AECEB and the AECL

to the Department of Energy, Mines and Resources, should be considered in a national public inquiry and incorporated into new legislation.

We recommend that final authority for decisions concerning disposal of existing high level nuclear waste rest with a temporary body, more broadly representative than the AECB, until new structures for the disposal of all forms of nuclear waste, and changes in the status and accountability of the AECB have been considered in a national public inquiry and incorporated into new legislation. (Recommendation 3)

## 2. Ethical dimensions of "technical" and "socio-economic" issues

The experiences of many groups participating in public hearings on nuclear related issues have been that there is an unavoidable interaction of technical information and values and beliefs in policy decisions. This interaction is seldom recognized in the planning of an inquiry. The concept assessment process as presently envisaged, with public hearings planned only on "socio-economic" issues, implies that the technical hearings will deal only with "matters of fact" in which ethical analysis and the public can have no role.

We recommend that review processes and public hearings be structured so as to enable decision-makers and the public to see clearly, and participate in discussions of, the ethical dimensions of both "technical" and "socio-economic" issues. (Recommendation 4)

## 3. Nature of the concept assessment decision

It has been stated that "acceptance of the concept will be a prerequisite to selection of any site for a waste

disposal facility".<sup>27</sup> It is not clear whether this means "approval in principle". Approval of the concept should not mean an approval in principle which forecloses serious consideration of the concept at the stage of site selection. Considered together, the hazards might be unacceptable. Approval in principle could then be used to foreclose any further debate about the continued development of the nuclear option in Canada, as argued in the Internal Review document cited above.

We recommend that the concept assessment stage should not involve approval in principle, but should lead to either rejection in principle or to agreement to examine detailed site specific proposals. We recommend further that each site selection proposal be subject to a public inquiry into the disposal concept, as well as to the specific issues pertaining to that site. (Recommendation 5)

#### 4. Strengthening of public participation

The sometimes frustrating previous experiences of groups participating in public hearings on nuclear related issues, and evidence that waste disposal planning in Canada has not been an open process, make imperative serious attention to mechanisms for strengthening public participation. Adequate funding of intervenors and full disclosure of information contribute to the fairness and representative nature of any inquiry.

We recommend that the Proposed Regulatory Policy Statement should establish clear provisions for the convenient and timely disclosure of information in the possession of the applicant, Atomic Energy of Canada Ltd., throughout the period of preparation of the concept assessment document. We further recommend that intervenors in the concept assessment hearings should be adequately funded well in advance of public hearings, to permit informed participation, useful research, and the use of expert witnesses. (Recommendation 6)

## B. Terms of Reference of Concept Assessment Document

### 1. Options to the concept of geological disposal

The Regulatory Policy Statement states that:

the crystalline (plutonic) rock disposal concept will be judged on its own merits without reference to other options. However, the rationale behind the choice of reference concept should be documented... Although not part of Concept Assessment, AECL should concurrently submit, along with the rationale supporting its choice of concept, documentation which details its review of other disposal technologies. As a contingency measure, AECL is expected to maintain a current awareness of these alternatives and to inform the AECB of steps which are being taken in this regard.<sup>28</sup>

A considerable quantity of waste already has been, and continues to be generated, and existing temporary storage facilities will become increasingly inadequate. It is necessary, therefore, to seek the least bad permanent disposal option for existing waste.

Because of the possibility that no option for the disposal of existing waste can or will be found acceptable "on its own merits", but will be found acceptable only in comparison with other options, we recommend that the concept assessment stage involve consideration not only of the crystalline rock disposal concept, but of all options which may have a reasonable chance of being found least bad.

(Recommendation 7)

### 2. Socio-economic considerations

The Regulatory Policy Statement indicates that:

Generic issues pertaining to socioeconomic impacts will be examined at the concept assessment stage through a review and assessment process which will include a public

hearing (or hearings) to be held under federal auspices. Well in advance of this hearing, the responsible body will issue detailed guidelines regarding the content of submissions. Based upon past experience, these guidelines can be expected to address a broad spectrum of topics which deal with federal, provincial, community and individual matters such as:

- (a) the implications with respect to energy policies and waste management strategies;
- (b) the availability of natural resources and capital;
- (c) transportation;
- (d) the availability of persons with the necessary skills required for each step to the life of the facility;
- (e) secondary job creation;
- (f) additional community services needed;
- (g) effect on property values; and
- (h) public perception of the risk associated with radioactive waste management.<sup>29</sup>

- (a) The guidelines outlined in the Regulatory Policy Statement to direct the AECL in the preparation of its concept assessment document appear to cover only technical, environmental and safety aspects of the disposal concept. The timing of the review and assessment process for socio-economic matters is not clear. Consideration of socio-economic matters should not be delayed, but should be given equal consideration with technical, environmental and safety issues by AECL in its preparation of a concept assessment document.

We recommend that the AECL be required to provide evidence in the concept assessment document concerning the acceptability of its proposal in relation to socio-economic considerations. (Recommendation 8)

- (b) As indicated in Recommendation 4 pertaining to the ethical dimensions of both technical and socio-economic matters, public hearings must be held in connection

with both aspects of the policy decision. We reiterate this point, because we question both the reason for including "public perception of the risks associated with radioactive waste management" as a socio-economic consideration, and the use of the terminology "public perception". It suggests that public apprehension is assumed to be unrelated to actual risks, and that risks will be addressed in the technical hearings only through the presentation of data from industry experts.

We recommend that "public perceptions of the risks associated with radioactive waste management" be defined as a contribution to the assessment of the technical, environmental and safety aspects of the disposal concept, rather than as a "socio-economic consideration". (Recommendation 9)

- (c) Socio-economic considerations which are not listed in the Regulatory Policy Statement or which deserve special emphasis, include financial cost; the distribution of benefits and costs/hazards; and the role of communities in decisions about the location of test drilling sites, disposal sites, and transportation corridors.

- (i) The comparison of various waste disposal concepts, or of various methods of proceeding with a single disposal concept, must be carried out with a clear understanding of the financial implications.

We recommend that evidence concerning the financial costs of disposal and an indication of who will assume these costs, be submitted by AECL as part of its concept assessment document.

(Recommendation 10)

- (ii) AECL has had considerable experience with communities where test drilling has been proposed or conducted, but the principles by which the AECL is guided are not at all clear.

Does the AECL proceed only if it has obtained community approval, and if so, what constitutes such approval? Are different principles involved when the AECL is using crown land?

We recommend that the AECL indicate in the concept assessment document the principles by which it will be governed when test drilling or disposal is planned in or near any community, and what role such a community will have in its decisions. (Recommendation 11)

- (iii) Recent reports indicate that shipments of spent nuclear fuel from AECL's Chalk River nuclear plant to the United States are being resumed, despite protest and court action.

Atomic Energy of Canada Ltd. said there will be six shipments this year, but would not disclose the dates or routes. They were postponed two years ago after being protested against by communities near cross-border bridges and banned outright by the bridge and port authority in Ogdensburg, N.Y. Early this year, the U.S. Department of Transportation overruled county regulations banning the shipments, clearing the way for resumption; but the State of New York, on behalf of several communities, has challenged the action in the U.S. federal court.<sup>30</sup>



The dangers of transporting spent nuclear fuel must be considered in assessing waste disposal options. The distance from nuclear reactors to disposal sites may be determined by the disposal option selected. For example, deep rock appears to point to selection of a Northern Ontario site a considerable distance from existing nuclear power reactors.

The principles, including the role of community approval, which would guide the selection of transportation routes, must be considered as part of the assessment of a waste disposal concept.

We recommend that the AECL state in the concept assessment document the principles and standards which it considers should govern the mode of transportation of spent nuclear fuel, the selection of transportation routes, and the role of communities en route. (Recommendation 12)

3. Technical standards and assessment of risks
  - (a) The Proposed Regulatory Policy Statement should clearly define the nature and stringency of its safety requirements. The Statement notes that it has left undefined its criteria with respect to dose estimation assumptions and methods, the length of time for which predictions of waste repository performance are necessary; the degree of statistical confidence to be required in predictions of repository performance; and the meaning of critical terms such as "natural background radiation", "small fraction" and "members of the public".<sup>31</sup>

In addition, we note the use of other vague terms such as "adequate", "feasible", "unacceptable", "normal conditions", "significant".

We recommend that the nature and stringency of application of the AECB's safety requirements be defined with precision and that these be addressed in advance of the drawing of conclusions from the concept assessment. (Recommendation 13).

- (b) A central question relates to the difficulty of assessing risks over time. The Regulatory Policy Statement requires a "defense-in-depth" approach to safety.

For a radioactive waste management system, defense-in-depth implies the use of multiple barriers, each of which is selected or designed such that the effective performance of the whole system does not rely upon the success, nor it is jeopardized by the failure, of any one barrier. As part of concept assessment, the probable frequency and potential consequences of all credible events must be estimated, assuming the worst conditions prevail.<sup>32</sup>

The assessment of risks involves a judgemental assessment in attempting to model the behaviour of the site.

We recommend that in order to clarify the judgements the AECL has made about risks in its predictive modelling, the AECL will be required to define a series of worst case scenarios. (Recommendation 14)

- (c) The Regulatory Policy Statement announces that post-closure monitoring will not be

necessary for technical reasons, but may be necessary because of "other societal concerns".<sup>33</sup> This implies that the predictive models used to assess the likelihood of release of waste will simply be assumed to be valid. We submit that no such assumptions can be made and that post-closure monitoring affords valuable scientific data both in the event that the rate of release of waste was correctly predicted, and even more important in the event that it was not.

We recommend that the AECL be required to submit in its concept assessment document plans for post-closure monitoring and for possible corrective actions in the event that the disposal method does not function as predicted. (Recommendation 15).

FOOTNOTES

1. We have worked closely with The Taskforce on the Churches and Corporate Responsibility in the preparation of their brief on Document C-71, and thus many of our comments and submissions are similar and, in some instances, identical to their comments and submissions.
2. The following summary of the history of nuclear waste disposal is taken primarily from Gordon H.E. Sims, A History of the Atomic Energy Control Board, Ottawa, 1981, commissioned by the AECB.
3. Plutonium can be used to fuel a nuclear reactor and is also the key ingredient needed to make atom bombs. It is one of the most toxic substances contained in spent uranium fuel.
4. G. Bruce Doern, The Peripheral Nature of Scientific and Technological Controversy in Federal Policy Formation, Science Council of Canada, Background Study 46, July 1981, pp.71-72.
5. Randle W. Nelson and Graham Saunders, "Atikokan is Everywhere", Last Post, February, 1980.
6. Canadian Coalition for Nuclear Responsibility, "Nuclear Wastes - what, me worry? A Critique of EMR Report EP 77-6, The Management of Canada's Nuclear Wastes", February 1978.
7. A.M. Aikin, "Nuclear Waste Management", in G. Bruce Doern and Robert W. Morrison, eds., Canadian Nuclear Policies, Institute for Research on Public Policy, Montreal, 1980.
8. Nelson and Saunders, footnote 5.
9. "Town to buck OMB decision on plebiscite", The Globe and Mail, January 14, 1982.
10. Kirk Makin, "Burying of waste no threat to health, official says", The Globe and Mail, June 16, 1981.
11. Sims, footnote 2, p.147.
12. Sims, footnote 2, p.148
13. Atomic Energy Control Board, "Deep Geological Disposal of High-Level Radioactive Waste", Information Bulletin 82-1, March 10, 1982.
14. A somewhat different assessment of the AECB in terms of "democratically open" and "professionally open" models

has been developed by G. Bruce Doern, Government Intervention in the Canadian Nuclear Industry, The Institute for Research on Public Policy, Montreal, 1980, p.56.

15. G. Bruce Doern, "The Politics of Canadian Nuclear Energy", in G. Bruce Doern and Robert W. Morrison, eds., Canadian Nuclear Policies, The Institute for Research on Public Policy, 1980, pp.56-57.
16. Liora Salter and Debra Slaco, Public Inquiries in Canada, Science Council of Canada, Background Study 47, September 1981.
17. Ibid., p.62.
18. Ibid., p.74.
19. See for example, "A Brief...to the Environmental Assessment Panel Regarding a Uranium Refinery Proposed Near Warman" from The Social Action Commission of the Regina Catholic Archdiocese.
20. Salter and Slaco, footnote 16, p.94.
21. Ibid., p.218.
22. For the Government's views on the "period of commercial difficulty": see Roy MacLaren, M.P., Parliamentary Secretary to the Minister of Energy, Mines and Resources, "The Future of the Nuclear Industry in Canada", to the Canadian Nuclear Association, February 23, 1982.
23. "Policy Review of the Nuclear Power Industry in Canada (Draft Report), Concluding Section". Results of an Inter-Agency Review conducted under the direction of Reiner Hollbach of Energy, Mines and Resources.
24. AECB Information Bulletin 82-1, footnote 13, p.3.
25. AECB Proposed Regulatory Policy Statement, Consultative Document C-71, 10 March 1982, p.8.
26. AECB "High Level Waste Disposal in Deep Rock: Process Begins of Assessing the Concept", News Release 82-2, March 10, 1982, P.1 (our emphasis added).
27. Ibid., p.1.
28. Proposed Regulatory Policy Statement, footnote 25, pp. 2-3.
29. Ibid., p.8.
30. "A-fuel shipments to U.S. resuming", Globe and Mail, March 27, 1982.
31. Proposed Regulatory Policy Statement, footnote 25, pp. 7-8.
32. Ibid., p.3.
33. Ibid., p.6.