EXHIBIT 1

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

OFFICE OF THE
ASSISTANT DIRECTOR
FOR ASTRONOMICAL,
ATMOSPHERIC, EARTH,
AND OCEAN SCIENCES

8 AUG 1976

Mr. W. H. Pennington
Director
Office of NEPA Coordination
U.S. Energy Research & Development
Administration
Washington, D. C. 20545

Dear Mr. Pennington:

Several individuals in the Foundation have reviewed ERDA-1536, DEIS - Waste Management Operations, and have no comments to offer.

Sincerely yours,

Edward P. Todd
Deputy Assistant Director

EXHIBIT 2

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

AUG 17 1976

Mr. W. H. Pennington
Director
Office of NEPA Coordination
U.S. Energy Research and Development
Administration
Washington, D.C. 20545

Dear Mr. Pennington:

Enclosed are our comments on the draft environmental impact statement concerning ERDA-1536, Waste Management Operations, Idaho National Engineering Laboratory (INEL), Idaho.

Thank you for the opportunity to review the document.

Sincerely,

Paul Cromwell
Acting Director
Office of Environmental Affairs

Enclosure

EXHIBIT 2 (Continued)

MEMORANDUM

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

TO : Director
Office of Environmental Affairs/DHEW

DATE: August 9, 1976

FROM : Principal Environmental Officer/H

SUBJECT: DEIS:ERDA Waste Management Operations, Idaho National Engineering Laboratory, Idaho

This environmental statement presents a summary description of the waste management operations at the Idaho National Engineering Laboratory formerly known as the National Reactor Testing Station. The statement includes descriptions of the separate operational and support areas, information related to each waste system, an analysis of the impact upon the environment from the radiological and non-radiological releases, and alternatives available to the ongoing waste management operations program. The statement is based on conditions as they existed in calendar year 1974.

The subject draft statement indicates no significant changes which have occurred in operations at the Idaho National Engineering Laboratory since previous comments on this on related programs were supplied to the AEC in 1974.

Insofar as radiation exposures are concerned those resulting from discharges of radioactivity to the atmosphere from stacks is the most important local source of man-made radionuclides found in the on-site or off-site environs. These releases are continually monitored at the source and in the environments. Resultant exposures to persons or populations either on-site or off-site are very low.

There is no discussion, however, regarding occupational health considerations for employees located within the specific buildings discussed, or those working in areas out-of-doors but internal to the overall facility complex.

Some of the employee personnel considerations may be included in appropriate occupational safety and health regulations of the Nuclear Regulatory Commission and the Energy Research and Development Administration. However, no information or data is presented in this document that addresses this issue or provides information on enforcement or operational safety to protect those workers in the immediate work environment.

It is apparent that there are many potentially hazardous radiation exposure situations in waste management operations and I feel it is important to provide some discussion to include considerations for personnel protection, work practice criteria, medical surveillance programs, etc.

In the December 4, 1973 letter to Dr. James L. Liverman, Director, Division of Bio-medical and Environmental Research, USAEC, from Dr. W.D. Rose, Deputy Assistant Administrator for Radiation Programs, EPA (appended in this impact statement), it was requested that details regarding on-site monitoring programs should be included in such environmental impact statements. The above-mentioned report only addresses this issue as it relates to the use of on-site monitoring for general release to the environment. The report does not address the use of on-site monitoring for protection of workers and environmental protection within the site boundaries itself.

Occupational safety and health issues should be considered in order to provide a complete and more effective environmental impact report.

While the actual current exposures to populations or doses to populations from liquid discharges are very low, the current practice does offer some remote possibility for future problems in this regard. Liquids containing low levels of radioactivity are released into ponds or wells. Those discharged into wells enter directly into the Snake River Plain Aquifer. It is noted in the statement that tritium from the facility in this aquifer has not been detected farther than about 5 miles from the release point which is still 3.5 miles inside the nearest site boundary. Strontium has not been detected at distances greater than about 5 miles from the point of release or about 7 miles inside the nearest site boundary. The statement notes that this situation has created a sociological commitment, which will be required in the foreseeable future, for surveillance of existing and future waste storage and disposal sites, including this water table which ultimately discharges into the Snake River.

Appendix E of the statement describes the ultimate disposal research and development program being funded at the Idaho Nuclear Engineering Laboratory to determine ultimate waste disposal methods. These include fluid-bed, calcination and post-treatment of commercial high-level wastes. This program would lead to the further conversion of calcined waste to a metal matrix waste form. The second project is molten salt combuster to determine the feasibility of reducing the volume of extremely low radioactive (beta-gamma) solid waste with the use of a molten salt combuster. Some follow-up research and development effort related to the potential use of this combuster for alpha contaminated waste will

also be initiated. Finally a project related to the long-term management of ICPP high-level wastes to establish the development and design of a system to retrieve and repackage calcine waste. Post-calcination treatment and calcine improvements will be evaluated on a cost-benefit basis to determine their role in a long-term management of ICPP high-level waste. Thus, the ERDA is continuing a program of research and development initiated by the AEC to seek solutions to these problems not only for use at the Idaho Nuclear and Engineering Laboratory, but which may also be applicable to the processing of waste from the nuclear industry generally.

An additional possible area of research which would be an alternative to the present calcining operation would be the conversion of liquid waste to glass by high-temperature melt. This alternative would involve the conversion of liquid waste and already calcine waste to various types of glasses, glass ceramics, devitrified phosphate glasses, and others. Such glasses could provide long-term storage stability and leach resistence. This concept has the most advanced waste fixation technology potential on a worldwide basis.

If this process is judged as an acceptable further step in long-term waste conversion appropriate facilities will be required. Such glasses and ceramics would presumably be suitable for ultimate disposal in a variety of ways.

Boris J. Osheroff

Control Slip #719

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

AUG 31 1976

Mr. W. H. Pennington
Director
Office of NEPA Coordination
U. S. Energy Research and
Development Administration
Washington, D. C. 20545

Dear Mr. Pennington:

#10289

Since our letter of August 17, 1976 in which we forwarded comments on the draft environmental impact statement concerning ERDA-1536, Waste Management Operations, Idaho National Engineering Laboratory (INEL), Idaho, we received the following additional comment from our Regional Environmental Officer in Seattle:

> The treatment of the leak mentioned in II-131 seems inadequate in light of the detail with which activities of less potentially hazardous radiation sources are dealt. This inconsistency may stem from the date of the leak (September 1975) which is outside the purported scope of the statement. Perhaps this subject could be dealt with in more depth in the final environmental impact statement.

Sincerely,

Charles Custard

Charles Custard
Director
Office of Environmental Affairs

EXHIBIT 3

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Room 345, 304 North 8th Street, Boise, Idaho 83702

August 18, 1976

W. H. Pennington
U.S. Energy Research and
Development Administration
Washington, D.C. 20545

Dear Mr. Pennington:

The Draft Environmental Statement (ERDA-1536) for Waste Management Operations - Idaho National Engineering Laboratory, has been reviewed by members of my staff. The statement appears to be quite comprehensive and complete, and we have no comments to make at this time.

We appreciate the opportunity to review and comment on this proposed project.

Sincerely,

Acting

Amos I. Garrison, Jr.
State Conservationist

EXHIBIT 4

DEPARTMENT OF TRANSPORTATION
MATERIALS TRANSPORTATION BUREAU
WASHINGTON, D.C. 20590

DIRECTOR

AUG 19 1976

Mr. W. H. Pennington, Director
Office of NEPA Coordination
U. S. Energy Research and Development
Administration
Washington, D.C. 20545

Dear Mr. Pennington:

We have reviewed the Draft Environmental Statement, ERDA-1536, which you have forwarded to Mr. M. Convisser, Director, Office of Environmental Quality, with your letter of June 29, 1976.

In those sections dealing with radioactive waste transportation, we have found nothing with which we are in disagreement. The greater portion of the discussion treats local on-site transportation which is not within our purview. Any off-site transportation would, of course, be subject to our regulations.

The opportunity to review this document is appreciated.

Sincerely,

James T. Curtis, Jr.

EXHIBIT 5

AGRICULTURAL RESEARCH SERVICE
WASHINGTON, D.C. 20250

UNITED STATES DEPARTMENT OF AGRICULTURE

OFFICE OF ADMINISTRATOR

September 1, 1976

Subject: Draft Environmental Statement, ERDA-1536, Waste Management Operations, Idaho National Engineering Laboratory, Idaho

To: W. H. Pennington, Director
Office of NEPA Coordination, ERDA
Washington, D.C. 20545

This is in response to your June 30 letter requesting comments on the subject environmental statement.

It appears to us that the most important aspects of any high-level waste management program are associated with future impacts on the environment. In this case, inadvertent releases into the ground water system would appear to be most important. Precautions must be taken to prevent this from happening.

From the standpoint of present implication to health and safety, the Idaho National Engineering Laboratory operation appears to be adequately controlled. The surveillance and monitoring systems appear to have been adequate to detect and quantitatively evaluate most releases of radioactivity that might have impact on the public health and safety. It is apparent that all releases have resulted in exposures that are only a small fraction of those allowable under present standards. Since we feel that current standards are conservative, we see no problem with the operation.

We trust these comments will be helpful.

H. L. Barrows
Deputy Assistant Administrator

EXHIBIT 6

Western Interstate Nuclear Board
P.O BOX 15038 • LAKEWOOD, COLORADO 80215 • (303) 238-8383
Wyatt M. Rogers, Jr.
EXECUTIVE DIRECTOR

September 17, 1976

Mr. W. H. Pennington, Director
Office of NEPA Coordination
U. S. Energy Research and Development Administration
Mail Station E-201
Washington, D. C. 20545

Dear Mr. Pennington:

The Western Interstate Nuclear Board staff has reviewed the Draft Environmental Statement, ERDA-1536 on the Waste Management Operations Idaho National Engineering Laboratory.

We find no major objections to the draft. It is assumed that further proof reading will correct minor errors, such as the half life of Cesium-137 in Table II-XXXVIII. I have discussed my more general comments with Dr. Albert E. Wilson, Department of Engineering, Idaho State University, the alternate member to the WINC Board from Idaho, and he will include them in his comments to you.

For the material presented the data base and analyses appear to provide a thorough discussion of the operation of the facility and of any possible hazards to the co-terminal environment.

We appreciate the opportunity to review and comment on this draft report.

Cordially,

Fred A. Gross, Jr.
Associate Director

FAGR:ps

cc: Al Wilson

EXHIBIT 7

DEPARTMENT OF TRANSPORTATION
REGIONAL REPRESENTATIVE OF THE SECRETARY
3112 FEDERAL BUILDING
915 SECOND AVENUE
SEATTLE, WASHINGTON 98174

REGION 10
Alaska
Idaho
Oregon
Washington

September 30, 1976

Mr. W. H. Pennington
Acting Director
Office of NEPA Coordination
U. S. Energy Research and
Development Administration
Washington, D. C. 20595

Re: Draft Environment Impact Statement
Waste Management Operations
Idaho National Engineering Laboratory
U. S. Energy Research and Development Administration

Dear Mr. Pennington:

The U. S. Department of Transportation, Region 10, appreciates the opportunity to review the subject DEIS. For your consideration, following are our comments on your proposed project:

1. This draft EIS primarily addresses on-site matters; however, (page II-70) indicates that waste material is received from reactors in numerous locations, including foreign locations. The text addresses a figure of about forty (40) as sources for waste material. In order that responsibility for transportation safety may be properly determined and requirements addressed; the EIS should identify, (1) points of origin, (2) transportation mode and route to INEL, (3) any points of transfer, storage or handling enroute, (4) quantities involved and the scheduling of transportation, (5) form of material involved, i.e., liquid, solid, etc.

2. A question arises from review of the current Master Management Program (page I-4) relative to the expected volume of waste material received at the INEL. Discussion appears to indicate the present volume of received waste material will remain constant for the foreseeable future. Programs and projects planned or under construction within the nation's fixed nuclear programs, or developments like the U. S. Navy Trident Project in Puget Sound would appear to represent a growth factor. Volumes, physical state, point of origin modes of transportation, probable routes, etc. should be addressed in relationship to the growth potential present.

3. Fire, chemical explosions or nuclear criticality are discussed (page III-136, 137); however, this discussion does not address material being transported to the INEL either under control of ERDA as discussed (page II-67) or under any other control. The text alludes to accountability and record requirements (page III-137) of some agency, presumably ERDA, preventing the accumulation of a critical mass. Waste material being transported or prepared for transportation which are subject to Hazardous Materials regulations published in 49 CFR 170-179 (see enclosure); additionally, if navigable waters are associated with such transport, Coast Guard regulations now published in 46 CFR 146, covering Dangerous Cargoes may apply. Transportation of hazardous materials are covered in the Department of Transportation Hazardous Materials regulations in the Federal Register dated Monday, September 20, 1976 (Book 1 of 2 Books) The association of transported material to all of the above regulations should be addressed; likewise, the authority, implementation and procedures referenced within the text regarding nuclear mass should be elaborated upon.

Sincerely,

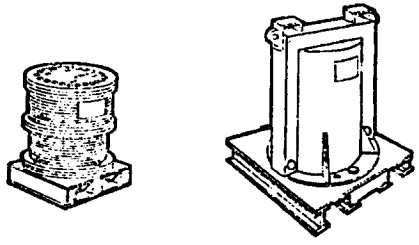
Don Samuelson

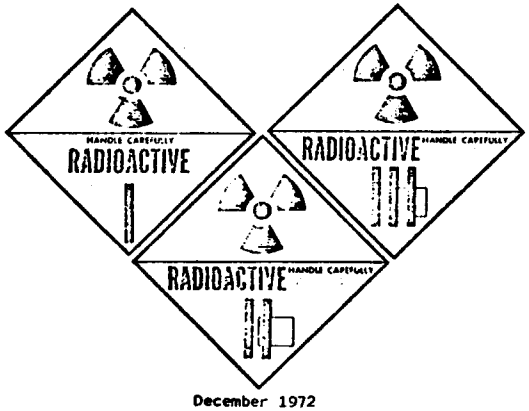
DON SAMUELSON
Regional Representative of the
Secretary of Transportation, Region 10

Enclosure

EXHIBIT 7 (Continued)

A REVIEW OF THE DEPARTMENT OF TRANSPORTATION (DOT) REGULATIONS FOR TRANSPORTATION OF RADIOACTIVE MATERIALS





December 1972

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY
OFFICE OF HAZARDOUS MATERIALS
WASHINGTON, D.C. 20590

packaging, labeling, and marking requirements of the U.S. Department of Transportation to the same extent as if the transportation were subject to the rules and regulations of that agency.

The Bureau of Explosives (B of E) of the Association of American Railroads was for many years the principal technical advisor to the ICC. The B of E no longer is directly involved in the development or administration of the U.S. radioactive materials safety regulatory program.

B. Federal Regulations*

The principal sources of Federal regulations pertaining to the transport of radioactive materials are listed in Table 1. The regulations of the United States of America are published by three agencies--the U.S. Department of Transportation, the U. S. Atomic Energy Commission and the U.S. Postal Service. This review is concerned primarily with those regulations of the U.S. Department of Transportation, as published in Title 49, Code of Federal Regulations, Parts 100 through 199. Persons involved as actual shippers, package designers, or carriers, are advised to procure a copy of these regulations (all in one bound volume) which are republished each year as of January 1, by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. (As of 1972, the cost was $3.75.) Changes to these regulations, in the form of amendments or notices of proposed rule making are published in the daily Federal Register, as issued by the Hazardous Materials Regulations Board (HMRB) of the DOT. Another means of keeping abreast of changes would be to request in writing to be placed on the mailing list maintained by the DOT, Office of Hazardous Materials, Washington, D.C. 20590.

DOT regulations are also published by the Federal Aviation Administration in Title 14, CFR, Part 103, and by the U.S. Coast Guard in Title CFR, Parts 146-149. The U.S. Coast Guard regulations, although using different paragraph and section numbers, are essentially identical with those as published in Title 49, with the exception of some additional specific requirements peculiar to shipments by water. The regulations o the Federal Aviation Administration as codified in Title 14, CFR, Part 103, in addition to specifying certain air carrier requirements, have th principal effect of making reference to the Title 49 standards for the packaging requirements.

*Throughout this Review the paragraph references listed apply to pertine paragraphs in Title 49, Code of Federal Regulations, Parts 100-199, unl otherwise specified.

EXHIBIT 7 (Continued)

TABLE 1

SOURCES OF FEDERAL REGULATIONS

1. Title 49	Department of Transportation's Hazardous Materials Regulations, Parts 170-189 (formerly called the ICC Regulations). Main Headings 49 CFR 170 - Rule-making Procedures of the Hazardous Materials Regulations Board. 49 CFR 171 - General Information and Regulations. 49 CFR 172 - Commodity List of Hazardous Materials Containing the Shipping Name or Description of all Articles Subject to Parts 170-189 of This Chapter. 49 CFR 173 - Shippers. 49 CFR 174 - Carriers by Rail Freight. 49 CFR 175 - Carriers by Rail Express. 49 CFR 176 - Rail Carriers in Baggage Service. 49 CFR 177 - Shipments Made by Way of Common, Contract, or Private Carriers by Public Highway. 49 CFR 178 - Shipping Container Specifications. 49 CFR 179 - Specifications for Tank Cars. 49 CFR 180 - Not Applicable. 49 CFR 181 - 189 - Reserved.
2. Title 14	Aeronautics and Space. Part 103 - Transportation of Dangerous Articles and Magnetized Materials.
3. Title 46	Part 146 - Transportation or Stowage of Explosives or Other Dangerous Articles or Substances and Combustible Liquids Aboard Vessels.

EXHIBIT 8

Paul Kiepe
2141 First Avenue S.
Payette, Idaho 83661
October 4, 1976

Mr. W. H. Pennington, Director
Office of NEPA Coordination
U.S. Energy Research & Development Adm.
Mail Station E-201
Washington, D.C. 20545

Dear Mr. Pennington:

REGARDING Draft ES ERDA-1536, copy of which your Idaho Falls office forwarded to me last July 20 as president of the Idaho non-profit corporation For a Habitable World, Inc., please be advised as follows:

The corporation, For a Habitable World, Inc., has been dis-incorporated and discontinued. As a small group of Idaho citizens committed, as an avocation, to monitoring AEC/ERDA happenings as they affect the state of Idaho, we found the job too tough. ERDA activities and its written outpourings about them we found too copious to keep abreast of, let alone respond to adequately as an Idaho citizen group.

However, since before the discontinuance of our group, I, as the person responsible for dealing with ERDA-1536, had devoted considerable study to it, especially in its various relationships to NRTS/INEL portions of notorious WASH-1539 (Draft) released from Idaho Falls Sept. 24, 1974, I shall respond briefly just as an Idaho citizen—not a corporate officer—as per the July 20 request for comment. ERDA-1536 page numbers appear for identification.

I

(III-111) The "Summary" at this page I find unsatisfactory in its reference to an "indefinite commitment of 158 acres of desert grazing land . . ." In the first place, the spread of transuranics as suggested by

(more)

Fig. III-26 "Concentrations of plutonium in soil around INEL facilities"(III-39) suggests the "indefinite commitment of" more like 5,000 to 6,000 acres, with the NE portion of the RWMC segment impinging upon Idaho State highways designated U.S. 20 and U.S. 26. ((See Fig. II-2 "INEL Facilities locations" (II.5))).

In the second place, neither at the summary nor elsewhere in the numerous references to RWMC throughout the document—none of which are indexed, because the document contains no index—does there appear spelled out the assurances Idahoans in overwhelming numbers wish to see in this new ERDA outpouring. The assurances I refer to appeared at p. 2.4-10 of WASH-1539, but that disaster of the AEC has been 'withdrawn' by the successor agency—whatever that means!

What we wish to be sure it does not mean is that ERDA intends not to honor the AEC committment, which reads as follows:

> . . . The AEC accordingly made a committment that (a) when a Federal repository in salt (already being planned for high-level wastes) became available, newly generated Rocky Flats wastes would be sent to it directly; and (b) beginning at the same time, the Rocky Flats wastes then accumulated at the NRTS /INEL/ would be transferred to it.

In the present statement pledge "(a)" is not repeated in any form; in the present statement pledge "(b)" appears in a paler form at page II-222, but since RWMC

(MORE)

often has been referred to by ERDA or its predecessor as a "federal repository," the sentence "Ultimate disposal will be at a Federal repository" may turn out to be just a cute way of disclosing plans for the Rocky Flats H-bomb debris—still being generated, still being shipped to Idaho—to be Idaho's permanent possession.

That we can't accept. The practice got started as a secret, putatively defense-related activity, with the 'scenario' being sold to the Idaho public that NRTS meant Nuclear Reactor Testing Station We learned we were being made a plutonium garbage dump , in exchange for the $100 million Idaho Falls payroll, only after the Rocky Flats fire and subsequent disclosures.

II.

The spread of plutonium from the 44 acres at RWMC to the 5,000 acres surrounding, as set forth in the map heretofore cited, seems inadvisable so long as such a wide difference of opinion exists amongst various factions of scientists regarding plutonium-239 toxicity. If Doctors Gofman and Tamplin are satisfied to do nothing about such attenuations as shown on the map, I'm satisfied too. But I'm afraid they are not satisfied from what I read at Chapter 8 of their book, Poisoned Power.

The danger is not only to the public, but to INEL

(more)

employees, especially those working inside the air-support buildings where (a) turbulence occurs all the time because of the opening & closing of the air-locks, (b) the soil is most contaminated, (c) the employees are contaminated continuously day after day, (d) the monitoring is run by ERDA/INEL, the interested agency, rather than by independent expertsin health physics.

I visited the first of the air-lock buildings (II-221) with a local (Boise) medical doctor. We found the exit surveillance of visitors and employees, by Geiger counter!, ridiculous (for alpha emitters) and the workmen moving about within the area without masks an invitation to disaster—if not right now, then just as soon as the more rusted-out barrels are reached. (The operation of retrieval described at II-221 commenced with the debris buried most recently.)

As for the levels of Pu contamination, I'll accept them as valid only after verification by an independent agency.

If EBR I is to be put on display as a national historical monument (II-264), it's all the more reason for cleaning up the spread plutonium and closing off the spreading sources. From my own tests at the site, I have concluded that an important source of spreading is

(MORE)

the activity of large rodents, such as gophers and prairie dogs.

When, at III-108, the statement says, "Some small rodent-type animals could burrow down to the buried wastes and ingest or spread contamination to the surface," I know this to be an area of outright deception in the draft. As long ago as three years one of the NRTS waste managers referred in Idaho newspaper interviews to the known activities of rodents in spreading the wastes. So how is it now the draft ES speaks of "could"?

In my own investigations (unauthorized by the NRTS/ERDA authorities) I purposely gathered a sample from a gopher mound. Taken about 400 yards north of the burial-ground fence, the sample still read—in alpha—as high as the highest sample reading of those taken within the fenced area not 50 feet from an open trench.

III

(III-1) The following statement is simply not true.

"There are no nearby nuclear facilities which contribute to the environmental radioactivity levels around the INEL, so the INEL facilities represent the only industrial sources of manmade radioactivity to which the local environment and its inhabitants are exposed."

The NRTS people themselves first brought to public notice the vast contamination of southeastern Idaho by radioactive polonium, product of phosphate rock smelting at Pocatello, about 40 miles SE of the site. Producers

(more)

EXHIBIT 8 (Continued)

of this contamination, also an alpha emitter, are amongst the biggest shots in Idaho—J. R. Simplot and the FMC Corporation; so the pollution goes on & on along with other even more immediately noxious ingredients.

Keeping these facts out of the present ES can only mean its producers are part of a conspiracy of silence, with probably a lot of quids for this quo still to become public knowledge.

Every person connected with the misstatement with which this section III commences needs looking into as to his knowledge or lack of knowledge, amidst the AEC-ERDA change-over, of the facts as I have given them here. The knowing violators of public trust in this terrain may have sprinkled similar deceptions elsewhere in the statement beyond my small abilities to detect them. The value of the ES depends a lot upon expert study by outsiders, not just amateur study like mine, to detect such faults. My suggestion is to hire some experts from one of the scientific groups ordinarily opposed to nuclear reactor proliferation, such as the Union of Concerned Scientists, to go over, not only the ES, but also its data and the persons and instruments used for data accumulation. On the basis of the little that I know, none of it do I trust that I find in ERDA-1536 Draft.

Respectfully submitted,

Paul Kiepe

Paul Kiepe

EXHIBIT 9

Public Service Company of Colorado

P.O. BOX 840 · DENVER, COLORADO 80201

October 4, 1976

Mr. W.H. Pennington, Director
Office of NEPA Coordination
U.S. Energy Research & Development Administration
Washington, D.C. 20545

Dear Mr. Pennington:

I am writing regarding our review of ERDA-1536 "Draft Environmental Statement Waste Management Operations Idaho National Engineering Laboratory June 1976". Since the Fort St. Vrain Nuclear Generating Station is on our electric system, we have reviewed the report with special attention to the high temperature gas cooled reactor (HTGR). Fort St. Vrain is the first commercial nuclear station to incorporate a HTGR in the design.

The Fort St. Vrain station is a Power Reactor Demonstration Program plant. The three party agreement for Fort St. Vrain specifies certain AEC (ERDA) responsibilities regarding reprocessing of fuel. Since reprocessing facilities for HTGR fuel are not currently available, it will be necessary to provide interim storage for spent fuel elements. It is our understanding that this storage will be provided at the Idaho National Engineering Laboratory.

We did not note a reference to Fort St. Vrain fuel during our review of the draft statement. A reference was noted regarding the cylindrical fuel from the Peach Bottom reactor which is presently being transported to the Idaho National Engineering Laboratory for storage. As opposed to Peach Bottom elements, the Fort St. Vrain elements are hexagonal graphite blocks of the same configuration as those proposed for future large HTGR's. Mention is also made of tentative plans for future HTGR facilities but to our knowledge there is no specific mention of the storage of Fort St. Vrain fuel.

We bring this item to your attention in the event that it would be appropriate to discuss this subject in the final statement.

Thank you for the opportunity to comment on this draft statement.

Sincerely,

Sam R. Ross

Sam R. Ross, Supervisor
Electric System Planning

SRR/kb

EXHIBIT 10

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230

October 5, 1976

Mr. W. H. Pennington
Director
Office of NEPA Coordination
Energy Research and Development Administration
Washington, D.C. 20545

Dear Mr. Pennington:

This is in reference to your draft environmental impact statement entitled, "Waste Management Operations Idaho National Engineering Laboratory." The enclosed comments from the National Oceanic and Atmospheric Administration, Environmental Data Service, are forwarded for your consideration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving ten (10) copies of the final statement.

Sincerely,

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosure - Memo from: NOAA

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administrati
ENVIRONMENTAL DATA SERVICE
Washington, D.C. 20235

August 31, 1976 Dx61/DLEC

TO: William Aron, Director
Office of Ecology and Environmental Conservation, EE

FROM: Douglas Le Conte
Special Projects

SUBJECT: EDS Review of DEIS 7607.13 - Waste Management Operations

No wind data are presented in the environmental statement. Since dispersion of gaseous effluents is of some concern, climatological information on wind direction and speed would be helpful in determining the direction effluents would travel. Wind data for 1974 were used in the calculational model used to develop radiological doses in the text, but the reader does not know how the concentration may vary in a given season, month, or smaller time frame. A tabular presentation of monthly winds would aid this assessment. Also, the calculated concentrations assumed release from a 250-ft. chimney. At what height were the wind data taken? The model uses boundary layer winds, but there is little information on how these were derived. A brief explanation would be helpful.

12630

12630

EXHIBIT .1

6 October 1976

Mr. W. H. Pennington, Director
Office of NEPA Coordination
Energy Research and Development Administration
Washington, D. C. 20545

Dear Mr. Pennington:

This letter, which contains comments on the Draft Environmental Statement for Waste Management Operations at the Idaho National Engineering Laboratory (ERDA-1536), is being written only after considerable thought and consideration of the problem to be faced. I refer to the natural tendency of the responsible group to accentuate the positive and play down the negative aspects of an operation. The atomic energy industry's legacy of secrecy and cover-up is one reason for the hostility toward nuclear power today and for the large credibility gap which must be overcome before meaningful discussions of issues can occur. Having begun a deception or cover-up, the responsible group is repeatedly forced to maintain it; generally, this results in additional deceptions which themselves must be preserved, and so on until the expanding bubble of half-truths and misleading statements is burst. The subsequent outrage of the deceived is nearly always greater than that which would have occurred had the matter been faced squarely at the outset. In spite of the general knowledge of this phenomenon and recent widely publicized examples, it continues to be widespread.

When compared with other Federal agencies (the Bureau of Reclamation comes immediately to mind) the AEC and its successor agencies have been exemplary in their response to the National Environmental Policy Act and in their concern for the environment and for the health and safety of the public. However, in a cursory review of the sections of ERDA-1536 dealing with liquid radioactive waste, I found ERDA's commitment to honest and straightforward presentation of the facts to be less than complete. So I made a more detailed review and prepared a set of questions which might reasonably be asked by a technically trained, probing reviewer.

1. Why doesn't the Summary, which everyone will read, accurately reflect the information presented in Section III. In Table I-I only the 1.3-mrem (not "mrem") dose from radioactive gases is compared with doses from natural and other manmade sources. However, in Section III we learn that a hunter who killed and ate the wrong duck might have received a whole body dose of 25 mrem and a thyroid dose of about 20 mrem. Also, certain antelope hunters might have received thyroid doses of about 20 mrem from I-129 and some small children may have received thyroid doses of about 10 mrem as the result of INEL operations during 1974.

2. The Summary also states that "all radioactive waste streams are monitored by highly sensitive instruments and are carefully controlled". This is a comforting statement, but it is not one which can stand much scrutiny.

a. The TRA liquid waste is said to be monitored by a gross gamma monitor, which may be "highly sensitive" but it won't detect some important isotopes. Since some of the waste water is from reactor primary systems and from experimental loops containing reactor fuels, it will certainly contain the fuel materials uranium and plutonium and probably americium and curium. None of these materials would be detected by the monitor and there is no mention of these toxic alpha emitters in any of the discussion of the TRA liquid wastes. Where have the radionuclides gone since their discharge to the seepage ponds? Are they present in ducks and antelope which might be killed off-site?

b. Iodine-129 has been found in grazing animals on and around the INEL. The principal source of the I-129 observed in antelope is the ICPP, as indicated in Table III-X; however, I-129 is not included in the listing of ICPP airborne effluents (Table II-XVIII) and Table III-II indicates the sources of I-129 to be NRF, PBF, and TAN. Iodine-129 is identified in TRA liquid waste but not in ICPP liquid waste in Table III-XVIII. Measurements by the EPA at the NFS fuel reprocessing plant in New York and others by the UNAMA indicate that I-129 is present in both gaseous and liquid effluents from such facilities. It seems clear that no "highly sensitive instruments" have been used to measure I-129 discharges to the atmosphere and aquifer at the ICPP.

c. Table III-XVIII contains no value for "unidentified alpha" in liquid waste discharges to the aquifer from the ICPP. Does this mean that no alpha activity was detected, that no measurements were made, or that an entry was deleted from the table? Table II-XXIV shows 458 Ci discharged to the aquifer at ICPP in 1974, while Table III-XVIII gives 457 Ci. Is this discrepancy reconciled by the inclusion of the "unidentified alpha" activity in Table III-XVIII? It is known that the radionuclides uranium-235 and -238; plutonium-238, -239, and -240; americium-241 and curium-242 must have been present in the fuel processed at the ICPP. If alpha-emitters were discharged, then those isotopes would have been present in the effluent stream.

3. On page III-81, an apparently last minute change states that only strontium-90 and tritium are detectable in the aquifer "over a significant area of distribution". How is that area defined? What other radionuclides have been detected in the aquifer prior to, during, or since 1974? What were the concentrations and over what area were the nuclides distributed?

X-141

EXHIBIT 11 (Continued)

4. What are the locations of the 10 acres of permanently dedicated lands discussed on page III-76 and why are the areas so classified? What radionuclides are present and in what amounts? What alternatives to perpetual care were considered?

The above comments identify areas about which the information presented in the Draft Environmental Statement is incomplete or misleading or worse. There are perhaps additional areas which could be highlighted if more time were available for review. In addition to: (1) clarifying for each facility [redacted] which measurements of gaseous and liquid effluents have and have not been made, (2) specifying the duration, frequency and sensitivity of the monitoring, and (3) providing a more detailed tabulation of certain results, ERDA should also evaluate the consequences of discharges which have been measured but are not discussed in the Draft Statement and of discharges which have only been estimated but are known to occur.

The public deserves better treatment from the agencies supported by its taxes. The public, the INEL, and one of the country's safest industries are all better served by a full and honest discussion of the known facts and their consequences. The Waste Management Operations Environmental Statement is the proper vehicle for such a discussion and ERDA is duty bound to present it.

Yours, sincerely,

Paul G. Voilleque

Paul G. Voilleque
1425 East 16th Street
Idaho Falls, Idaho 83401

EXHIBIT 12

Dennis Donnelly
532 North Hayes Avenue
Pocatello, Idaho 83201

October 6, 1976

Mr. W.H. Pennington, director
Office of NEPA Coordination
U.S. Energy Research and Development Administration
Mail Station E-201
Washington, D.C. 20545

Dear Sir:

I am writing to transmit my comments on the Draft Environmental Statement, Waste Management Operations, Idaho National Engineering Laboratory, Idaho, June 1976.

From the beginning to the end of this document, I was very shocked and disappointed by gaps in the information presented, by internal contradictions in the information presented, by the willingness of AEC/ERDA officials to "commit" vast amounts of Idaho's land and water resources to radioactive contamination beyond any hope of their being able to clean it up-- even beyond any hope of our civilization's lasting long enough to fully manage the hazards they're creating!

I feel the incredibly long-lived nature of the dangerous materials processed and impounded at the INEL transcends the temporal notion of federal ownership of the land, and forces us to consider our stewardship of the planet for its future inhabitants. This notion of stewardship, I feel strongly, is what the National Environmental Protection Act is all about, and this is a key ingredient which seems to be missing from your agency's Draft Environmental Statement on the waste management operations at INEL.

I hope to point out to you in the ensuing pages of my commentary why I am forced to the dismal opinion that this Draft Environmental Statement is a self-serving, deceptive document from an organization that doesn't really care what it does to Idaho's land, water, air, or future.

I must begin at the beginning... on page I-1, the Introduction lists the objectives of radioactive waste management at INEL. You might consider adding the following:

- permit nuclear industry in this country to keep functioning by accepting problem materials not acceptable elsewhere

How is it that your four-pound document fails to explicate or even note the difficulties with storing transuranic wastes that have caused the states of South Carolina, Kentucky, and New York to refuse to accept these wastes?

Another conspicuous gap from the very first page(I-1) lies in your Background's discussion of the original mission of INEL. It mentions that INEL was established essentially for research and testing purposed. I just fails to mantion why or when the terrible additional burdens of nuclear fuels reprocessing and storage of wastes from other sites were added to the list.

From an environmental viewpoint, these additional burdens are most significant. The who, how, and why of these decisions should be included in your Background. Leaving this unsaid will not serve public confidence in your organization.

Another major gap is this document's use of 1970-1974 average waste volumes to project health effects to the year 2020 (See page III-122). ERDA regularly publishes its projections for growth of the nuclear industry. Instead of looking at the past and predicting constant throughputs until 2020, your Draft Environmental Statement should use ERDA projections and divulge plans for expected throughput at INEL in this critical estimate of health effects.

This "constant volume" projection ignores both the volume growth indicated by the jump in 1974 over 10-year average volumes (page I-2), and the current construction of a second fuel-reprocessing facility to increase the throughput at ICPP. I find the self-serving distortion resulting from this shallow analysis to be highly objectionable.

I object also to your projecting health effects for 100 to 150 years, when the problems you're creating will last a million years and more. Our ability to manage these problems just isn't equal to the problems. Your notion of stewardship seems to be to look at 1/10,000th of the problem in a shallow fashion, then to assure our citizens that the problems are well in hand. I'm not satisfied that they are.

I would mention that assumptions (b) and (c) on page III-122 are identical as stated. I believe you meant to state the year 2000 in assumption (b).

The last paragraph on page II-2 is grossly incomplete without mention of the Big and Little Lost Rivers, and Birch Creek, with note that these flow onto the INEL site, and percolate through the surface layers down into the aquifer. Even though this is made clear later in the document, it should also be part of your initial description of the hydrology of INEL, due to its major implications for the suitability of INEL for long-term waste storage(or were thes e implications why it was omitted?).

The map on page II-5 should indicate the boundaries of the aquifer by shading, else your initial "detailed description" has the major shortcoming that the reader has to get clear to page II-299 before seeing a schematic of the aquifer.

On page I-2 it is pointed out that 34 reactors at INEL have completed their missions and are inactive now. An "active" decontamination and decommissioning effort is mentioned, but the objectives of this program is not made clear. I feel that Idahoans should be assured that your decontamination and decommissioning efforts will restore the land in question to full, unrestricted use in the near future. These "D&D" programs should be funded as part of the startup costs of the reactors, instead of after-the-fact, as mentioned on page II-264. Only then will the real costs of this equipment be shown to be as staggering as it seems to this observer. Only then will the stewardship of our generation be properly exercised, instead of dumping the costs with the problems onto future generations.

On page II-267, the description of the waste-solidification process is incomplete... not mentioned are the radioactive volatiles which are driven off by the calciner. These are simply vented to the atmosphere, and they constitute about 1/8 of the total radioactivity in the high-level wastes being solidified. I am very disturbed by ERDA assurances that a quarter-million curies of radioactivity in our air each year is OK because it is sufficiently diluted with clean air.

The weather studies of the INEL region, on page II-274 et seq., overlook the major fact that the upper Snake River basin forms one of the largest, if not the largest, natural temperature-inversion regions in the world. The air at Pocatello was heavily fouled this year by range fires clear over at Mountain Home, for example. This means that your climatology studies are grossly inadequate to the task of predicting the population exposures resulting from radioactive releases to the atmosphere at INEL. Note the table on page III-57, showing the cesium-137 concentrations in the sheep from Humphrey, Idaho (some 70 miles from ICPP) to be about ten times greater than in the sheep from communities closer to the INEL site. No mention is made of this peculiar datum in the Draft Environmental Statement

In fact, there is precious little information in this whole book relative to biological sampling of wildlife or domestic animals in the INEL region. I know this sampling goes on all the time; the results are just excluded from your Draft Statement. To convince the public (and me) that nuclear operations at the INEL site are not in fact contaminating the region, you should include abundant data on biological sampling of all kinds of plants and animals--preferably conducted by a disinterested organization such as the biology department at Idaho State University (which does a good deal of this type of monitoring.)

The final paragraph on page VI-2 seems to contain outright lies. "The disposal of liquid wastes to the aquifer, either radioactive or nonradioactive, involves only a short-term commitment." --What? Tritium is one of the materials requiring 'perpetual' surveillance (according to the information on page I-16), and tritium is the largest radioactivity released to the aquifer. The author's commitment to manage the problem may be short-term, but the problem is not.

"If disposal of waste effluents were discontinued, the effects would probably not be distinguishable at any location within 10 years." See Fig. III-34 (on page III-38) for another view of this, which completely contradicts this claim!

My final comment is to deplore this document's defense of the soundness of INEL as a waste repository. The decision to site the nuclear-waste storage complex and the nuclear-fuels reprocessing operations right over the Snake River aquifer, very close to the Big Lost River--which percolates down into the aquifer in this area--and in a volcanically/seismically active area to boot, was about as bad a decision as could be made on this problem.

Could it be that this region of abundant hydrology was selected on purpose? It certainly is possible that future security problems will make it necessary for reactors to be located at the same site as fuel-reprocessing and waste-storage facilities. In that case the huge Idaho site makes some sense that a sinister ERDA isn't telling us about.

One more comment pointing to a major environmental omission in the Draft Statement: a recent analysis (Radiation Data and Report Dec. 1974, p. 767.) shows that with current techniques, all the current commercially operated waste burial sites will be full by 1998. This implies a continued need for more land to be totally committed to this function, soon and forever. This Draft Statement completely ignores this need, and assures the reader that a constant 210 acres is all that will ever be needed. I somehow doubt that.

Very truly yours,

Dennis Donnelly

Dennis Donnelly

EXHIBIT 13

Exhibit
Oct. 7, 1976

Mr. W H Pennington, Director
Office of NEPA Coordination
ERDA
Washington DC 20545

Dear Sir;

After reviewing ERDA-1536, I have two comments:

1) Contamination, when used and referred to in the text, should be further defined as a) "Fixed" contamination (i.e., activated structures) or b) "Loose Surface" contamination (that contamination that can be removed by "smears."

2) With the INEL fuel processing & releasing relatively long-lived gaseous isotopes to the atmosphere, the article "Meteorological Consequences of Atmospheric Krypton-85" (Science, Vol 193, pgs 195-198, 16 July 1976) should be addressed in some depth in order to give a new perspective in the EIS.

Thank you for your consideration. I would appreciate a copy of the Final Environmental Statement.

Very truly yours
Neal Wilson
Neal Wilson
5 Brook Rd
Enfield, CT 06082

X-145

EXHIBIT 14

Scott Harris
Connie Harris
Nicholas Harris
16 South 11th St
Payette, Idaho

October 7, 1976

W. H. Pennington
Director, Office of NEPA Coordination
U.S. Energy Research and Development Administration
Mail Station E-201
Washington, D.C. 20545

Dear Sir;

We are unequivocally opposed to nucleur waste storage at the Arco, Idaho sit
We wish to have our comments included in the environmental process now under way to
assess future storage at this facility.

The site is located above the Snake River Acquifer, a highly permeable layer
characterized by large flows of underground water which surface into the Snake Rive
It may take many years for wastes already accidentally and deliberately dumped into
the water table to surface in rivers and wells but the wastes proposed to be stored
have many thousands of years to make that journey and still retain their toxicity.
For instance, Plutonium 239, an inevitable by-product of the breeder reactor situat
at Arco, posesses a half-life of 30,000 years. Ten pounds of this waste, dispersed
evenly throughout the atmosphere, would cause everyone in the world to contract lun
cancer. This by-product has no use except in the production of plutonium bombs. I
will dissolve a steel drum in 3 years and a stainless steel drum in 20.

In order to safely store this waste you must gaurentee the existence of a go
ernmental system which will, without a single failure, contain this grim legacy for
time period which exceeds by 50 times the span of any singly governmental system in
history. Can you, personally and for the sake of all people, gaurentee this stabil

If we are to safely utilize nucleur potential we must be able to safely neut
its by-products and we must be able to do so before we continue with such projects
the breeder reactor. Placing them in the ground calls to mind an image of a suicid
ostrich. For these reasons and for the sake of continued human existence we demand
all nucleur waste storage be stopped and a realistic honest appraisal of those wast
already loose in the ground be commenced.

Sincerely,
Scott Harris
Connie Harris
Nicholas Harris

12773

Scott, Connie an
Nicholas Harris

EXHIBIT 15

STATE OF IDAHO
OFFICE OF THE GOVERNOR
BOISE

CECIL D ANDRUS
GOVERNOR

October 8, 1976

James L. Liverman
Assistant Administrator
for Environment and Safety
U.S. Energy Research and
Development Administration
Washington, D.C. 20545

Dear Mr. Liverman:

Attached are some comments from Idaho agencies on ERDA-1536. In reviewing my agency comments and the document itself, I would specifically like to point out one glaring omission to you.

For several years, Senator Church and I have had an understanding with, first the old Atomic Energy Commission, and now ERDA, that a commitment existed on behalf of ERDA to the State of Idaho to begin to remove all radio active wastes, both those buried under ground and those stored above ground, from above the Snake River Aquifer, starting at the end of this decade. Nowhere in ERDA-1536 is this commitment mentioned.

Considering that ERDA-1536 is to be the Draft Environmental statement on the waste management operations at the Idaho Engineering laboratory, I consider this omission to be inexcusable and before the statement can be considered adequate, I feel it incumbent upon me as Governor of the State of Idaho to insist that this commitment is put in writing in the environmental impact statement, ERDA-1536.

Along with the comments from my various state agencies, I am also attaching a copy of the testimony I delivered on WASH-1539 last year in Salt Lake City. I would specifically point out that there, too, I reminded ERDA of this commitment. Personnel at the INEL are very aware of this commitment and I trust they, too, have pointed out this oversight to you with internal memorandums.

If I have one general complaint of ERDA-1536 as opposed to the above specific complaint, it is that very little attention is given to the expected environmental impact of waste management programs at the INEL. This general complaint is naturally an outgrowth of the specific complaint I have mentioned, but from reading through the statement, it is clear to me there is practically no information provided relative as to how much waste the INEL can expect to receive between now and the end of the decade when ERDA is supposed to begin removing that waste from above the aquifer. Nor is there any description of what form waste from traditional sources can be expected to take in the future.

Neither is there any clear division in ERDA-1536 between the concepts of storage and disposal. It appears that all material which is being buried is considered to be "disposed of" and that it will be left buried forever. This implication runs counter to ERDA's pledge.

On the other hand, material which is stored above ground will eventually be removed to a permanent disposal site, supposedly. The problems in using these terms appears throughout the document.

As I stated, there is no clear statement of future activities which will change the impacts described in ERDA-1536. Some questions which should be clearly answered, for me, are:

Liverman AES

12752

1. Is there any plan to transfer the calcined high level waste to a federal repository when one is selected?

2. Will burial of non-transuranic radioactive waste continue beyond the end of this decade?

3. Will the long-lived non-transuranic wastes which are presently being buried ever be retrieved as promised for transfer to a federal repository or are they really disposed of at their present site?

4. Is the present level of activity at INEL expected to change?

5. Is the rate of generation of waste at other areas such as Rocky Flat expected to change?

Granted, it is important to discuss the past, but an EIS should address the future impact with the goal of improving the operation. ERDA-1536 falls far short in this respect.

Sincerely,

CECIL D. ANDRUS
GOVERNOR

Cpl

enclosures

cc: Dr. Charles Wood
Charles E. Williams
W. H. Pennington

STATE OF IDAHO
DEPARTMENT OF HEALTH AND WELFARE

DIVISION OF ENVIRONMENT
Statehouse
Boise, Idaho 83720

October 4, 1976

State Clearinghouse
Bureau of State Planning and Community Affairs
Statehouse
Boise, Idaho 83720

RE: Waste Management Operations, Idaho National Engineering Laboratory, Draft EIS

Gentlemen:

The Division of Environment has reviewed the above document and have the following comments:

1. Big Lost River Channel. It is pointed out in the draft statement that no surface water flows away from the INEL; however, water does flow onto the INEL site and then off again as ground water drainage to the Snake Plain Aquifer. The Big Lost River, for example, flows within 1.5 miles of the RWMC where millions of curies of radioactive materials are buried and stored. The statement doesn't examine the possibility of a laterial flow between the channel and the disposal site. Why aren't surface waters in the Big Lost River monitored?

2. Radioactive Waste and Scrap Facility. The draft doesn't provide an analysis for the millions of curies of radioactive waste stored at ANL-W (p. II-49). Is this waste mixed fission products? Transuranics? What are the eventual plans for the deposition of this waste?

3. High-Level Liquid Radioactive Wastes--Tank Storage. As noted on page II-97, large quantities of high-level liquid radioactive wastes are stored at a tank farm adjacent to the ICPP. The draft statement minimizes at length the probability of tank rupture, whatever the cause (earthquake, sabotage, etc.). Nonetheless, the statement should examine the environmental burden posed for the Snake Plain Aquifer should the wastes reach it. For example, what quantities of radioactive materials would be deposited in the aquifer? What concentrations are involved? What of the suitability of the aquifer for continued use as irrigation and drinking waters? This estimation of potential aquifer damage cannot be ignored in the preparation of this environmental statement.

4. Future Wastes at INEL. The draft statement notes that only ERDA-generated radioactive wastes have been buried or stored at the INEL. The sources of future wastes are not discussed; for example, will commercial transuranic wastes be stored or buried at this government-controlled facility? Only recently, there was a ruling that commercial

EQUAL OPPORTUNITY EMPLOYER

transuranic wastes in concentrations of 10 nanocuries/gram or greater cannot be buried at commercial waste sites. Such wastes are required to be sent to a federal government facility for storage or eventual disposal. Do future plans call for the INEL to be such a storage facility for commercial transuranics?

5. Independent Reviews of Waste Management Practices. On page II-225, the draft statement eludes to independent assessments of the INEL waste management practices by the Idaho Department of Environmental and Community Services (formerly Department of Health) during October, 1968 and January, 1974. We feel these sessions were more of a "tour" nature rather than an "independent review". We recommend the deletion of this reference.

6. EBR-I Wastes. The draft statement specifies the reason that the quantities and characteristics of radioactive wastes generated by EBR-I are not available (p. II-258).

7. Environmental Surveillance Program. The draft statement describes an environmental radiation surveillance program conducted by ERDA (HSL), USGS and NOAA. Who reviews and interprets the results of these monitoring data?

8. Plutonium Soil Contamination. The draft statement describes plutonium contamination in the vicinity of the RWMC and other INEL facilities (p. III-381). No explanation for the origin of this contamination is given. The historical trends for this contamination is not discussed, e.g. is it increasing or stable? Plutonium levels are discussed in terms of "so many times those levels from the off-site average." This type of quantification does not permit an evaluation of the magnitude of the plutonium contamination problem. Too, the draft statement doesn't discuss the plutonium resuspension factor around the RWMC or other INEL facilities.

9. High-Level Liquid Radioactive Waste Transfer Pipe Leaks. The draft statement notes the "discovery" on three separate occasions of high-level radioactive liquids having broached the underground transfer piping network and contaminated subsurface soils within the ICPP complex. In each instance, the bodies of contaminated soil were unsuspected and were "discovered" in the course of a routine work assignment. As there is no positive assurance that other unsuspected leaks have not occurred, the draft statement should describe a program to leak test all waste lines in the tank farm vicinity. Too, such an evaluation should be repeated at reasonable intervals.

As in the case of tank rupture, the draft statement should examine the environmental burden placed upon the Snake Plain Aquifer had these known leaks reached it.

STATE OF IDAHO
OFFICE OF THE GOVERNOR
BOISE

CECIL D. ANDRUS
GOVERNOR

TESTIMONY OF GOVERNOR CECIL D. ANDRUS

Before the

Hearing Examiner and Board appointed by the Atomic Energy Commission to listen to testimony on WASH-1539, the Draft Environmental Impact Statement concerning commercial nuclear wastes.

December 12, 1974

Ramada Inn-Airport

Salt Lake City

RECEIVED
JUL 7 1976
DHW-Environmental Services

STATE OF IDAHO
DIVISION OF BUDGET, POLICY PLANNING AND COORDINATION
BOISE, IDAHO 83720

CECIL D. ANDRUS
GOVERNOR

H. W. TURNER
ADMINISTRATOR

TO: Department of Health and Welfare
Div. of Environment
Statehouse Mail

DATE: July 7, 1976

FROM: State Clearinghouse
Bureau of State Planning and Community Affairs
Statehouse
Boise, Idaho 83720

RE: Waste Management Operations, Idaho National Engineering Laboratory

SAI # 00766976

The enclosed draft environmental statement is referred to you for review and comment in accordance with the U. S. Office of Management and Budget Circular A-95. If your agency has an interest in this document and wishes to comment on it, please check the appropriate box (es) and return this memo, with your comments, to the State Clearinghouse no later than September 15, 1976.

☐ No Comment

☐ Contacted Applicant

☐ I Was Already Aware of This Project

☐ Comments Attached

Reviewers Signature _____ Date _____

Title _____

State Clearinghouse
October 4, 1976
Page Three

Certain other comments in regard to solid waste are:

1. Upon talking to INEL staff in Boise concerning the new proposed federal legislation on solid waste and non-radioactive hazardous waste, we were pleased to know that INEL already has most of these types materials on computer inventory and very little adjustments to the current program would be necessary to make a print out to satisfy the requirements of the hazardous waste management aspects of this proposed law, should congress pass this piece of legislation.

2. In reference to INEL's demolition disposal site, although the federal solid waste guidelines do not, Idaho's solid waste guidelines do provide for bulky waste or demolition disposal sites operated separately or in conjunction with a sanitary landfill with maintenance performed at a frequency less than that required at a sanitary landfill. However, in 1973 when we revised the Solid Waste Management Regulations and Standards we have not specified in the regulations the specific number of coverings per year. The frequency of covering has been determined upon each application's merit and a Conditional Use Permit has been issued thereon:

   We have in an effort to keep up with the times set somewhat of a president at the large demolition fills and at the demolition areas of sanitary landfills by asking for and securing once per week maintenance and cover of the demolition material.

   In light of the above, INEL's demolition site should be reviewed in terms of methodically achieving a higher practical management level.

Thank you for the opportunity to review and comment on this statement.

Sincerely,

DEPARTMENT OF HEALTH AND WELFARE

Lee W. Stokes, Ph.D., Administrator
Division of Environment

LWS/MHR/br
cc: Walt Jaspers, EPA, Region X
EPA-Idaho Operations Office
Mike Christie
Jerome Jankowski
Wayne Heiskari

EXHIBIT 15 (Continued)

Testimony before the AEC's Hearing Board on WASH-1539

Mr. Chairman, members of the hearing board, ladies and gentlemen:

Let me begin by first thanking the Atomic Energy Commission for recognizing the need for holding a hearing on WASH-1539, your draft environmental impact statement on the handling of commercial wastes.

As the three candidate sites are all located in the West, we in Idaho appreciate the opportunity afforded Idaho's citizens to travel here and comment if they choose.

I begin my testimony, Mr. Chairman, by first stating that I fully endorse the findings of Idaho's Blue Ribbon Study Commission, chaired so ably by the President of Idaho State University, Dr. William E. Davis.

The Blue Ribbon Study Commission and its members did an excellent job of sifting through a difficult and often vague environmental statement, and they arrived at a position that they and I feel is truly in the best long-term interests of Idaho.

They are further to be commended for putting together a series of public hearings across the State on the AEC's environmental statement. I think they solicited a truly representative sample of Idaho sentiment towards your environmental statement.

Dr. Davis presented the Blue Ribbon Study Commission's conclusions, which were unanimously approved by the committee, at your November 12th hearing in Germantown, Maryland.

I now, for the record, formally endorse those conclusions, some of which I'll review later in my testimony.

Mr. Chairman, Idaho has one predominant concern over-riding all other considerations given to the AEC's environmental statement--and that is water.

Water is Idaho's lifeblood, it is that which has made possible our great agricultural economy. It is the basis of Idaho's economy, the support of much of the livelihood of her people, the very reason for our State's existence.

The Snake River, as it flows through southern Idaho, is truly a working river, a river that works for the overall good of Idaho. An Governor and any politician in Idaho recognizes the almost sacred re water is held in by most Idahoans, and the safeguarding of this wate becomes a sacred trust for any public officeholder.

Like it or not, this is the way it is, and the Atomic Energy Commission must recognize that the majority of Idahoans perceive the interim waste storage site at the Idaho National Engineering Laborat to be a potential threat to the vast Snake Plain Aquifer flowing und the INEL, and thus, a threat to their lifeblood.

The first and the most important requirement for the Atomic Energy Commission, then, is to give Idaho a definitive time-table for the removal of all transuranic atomic wastes from above the aquifer.

Heretofore, the Atomic Energy Commission has given Senator Church and myself assurances that they would begin to remove these wastes by the end of this decade.

But that assurance is too vague for many Idahoans. We need a definitive time schedule which tells Idaho citizens when the above-ground barrels and boxes of waste will be removed.

And, we need a definitive time-schedule for the removal of the vastly larger number of barrels and boxes containing transuranic wastes which were unwisely buried under the ground at the site prior to 1970. We recognize this retrieval, repackaging and removal program will take time, but we would like to see a schedule which gives detail on how much time.

Both Senator Church and I recognize that because the INEL already contains most of the nation's transuranic wastes, this retrieval and repackaging process will inevitably lead to the construction of a processing plant whose probable purpose will be to reduce further the volume of the transuranic waste.

I am told this could involve an incineration process with the final product being an ash that would then be repackaged for purposes of interim storage.

Both Senator Church and I, however, stand firm in our belief tha the AEC, as it is committed to do so, must remove these wastes from above the aquifer.

If there is a location on the INEL not above the aquifer or some other site in Idaho on Federal land away from the aquifer where the AEC might want to store on an interim basis these transuranic wastes which have been processed and repackaged, we would be willing to listen to any proposal.

As mentioned in the Blue Ribbon Study Commission's report, we in Idaho do reserve the right to review and comment upon the subsequ environmental impact statement that gives the necessary comprehensiv detail needed to judge such a proposal intelligently.

Let me repeat, though, to the interim storage of commercial transuranic wastes, which could conceivably sit for a period of year upon the asphalt pads above the aquifer waiting to be reduced and repackaged in the processing plant, we in Idaho give an emphatic "no

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I believes Idahoans want the AEC to first remove the waste it has buried at the INEL before even considering the processing of some commercial waste for shipment off-site or to the permanent geological depository site.

When the Atomic Energy Commission already has a commitment to remove hundreds of thousands of barrels of waste from above the Snake Plain Aquifer, it makes little sense to me and to most Idahoans for the Atomic Energy Commission to discuss bringing in an additional 200,000 barrels of commercial transuranic waste for an interim storage period of 30 to 50 years.

I cannot emphasize enough that I do not believe there is any causal relationship between an expanded Research and Development waste management program at the INEL and the additional interim storage of commercial transuranic wastes.

Some people at the INEL and elsewhere have quietly hinted to me as well as to members of the Blue Ribbon Study Commission that if Idaho expects some good, they have to take some of the bad--that is, if we want Idaho's future to continue to expand in the R & D of waste management, we have got to be willing to take some of the commercial transuranic wastes for an interim period before we even have a facility designed to process it and expedite its removal.

6

Idaho already has sufficient transuranic wastes stored above and below ground for whatever R & D program the AEC might have in mind. There is absolutely no need to bring in additional transuranic wastes under this pretense.

It seems only logical that with 200,000 drums and 19,000 boxes of waste still buried at the INEL burial grounds, and the sensitive treatment needed to retrieve, repackage, and remove these wastes, Idaho's INEL is going to get its fair share of the R & D funds dedicated by the AEC to waste management.

Again, I see nothing in the INEL's future that requires an expansion of the interim storage of commercial transuranic wastes.

The AEC's commitment is to remove the wastes above the aquifer as soon as possible, starting with the latter years of this decade, and I suggest the AEC get on with that program.

Now, Mr. Chairman, permit me to expand upon two other points made by Idaho's Blue Ribbon Study Commission.

I do not think that enough emphasis can be placed upon the recommendation that the AEC leave commercial wastes at the site where those wastes are generated until the designation of a permanent geologic depository site.

It makes little practical or economic sense to ship something twice clear across the country when one shipment to the so-called final resting place is all that is required.

It particularly makes little sense when one is told that it is a regulation the AEC is promulgating that the commercial transuranic wastes be turned over to it for disposal, and not a congressionally mandated law backed by a legally-imposed deadline.

I contend that the commercial waste can be left at the commercial reprocessing site (as an example, Savannah, Georgia) where it is generated and this practice would have no adverse consequence on the environment.

I would also contend that these commercial reprocessing plants can benefit from the technology that has been pioneered by the INEL. On a smaller scale, using above ground pads for easy retrievability, the wastes can be stored until such time as the AEC is ready to transport the commercial wastes to the permanent geological depository site.

The other point I wish to expand upon is the Blue Ribbon Study Commission's recommendation to speed up efforts on the location and development of a permanent geological depository to which commercial wastes stored at the site of generation and the present wastes so far stored at the INEL can be quickly removed.

I feel the Atomic Energy Commission has been somewhat remiss and has displayed a lack of just plain old p.r. sense in not having already announced its detailed plans for a permanent geologic depository site in concert with the publication and release of WASH-1539.

It has been three years since the AEC abandoned its plans for a depository site near Lyons, Kansas. In the past three years I have seen and the public has seen very little evidence of any concerted effort to locate and develop a permanent depository.

I submit to you gentlemen that the AEC invites distrust and disbelief on the part of a suspicious public when it announces elaborate plans for interim storage sites for commercial nuclear wastes, and interim is then defined as at least 30 to 50 years.

There is justifiable concern on the part of a skeptical public that interim might become in fact a "de facto" permanent site.

There is justifiable concern that the sneer economics of selecting and then utilizing an interim storage site might preclude the practical development and elaborate expense involved in the development of the real permanent location.

As you gentlemen are well aware, just as Congress can enact legislation that alters the character or abolishes previous legislation, so too can a future Director of ERDA (Energy Research and Development Agency) contend that commitments made by the old AEC in 1969 or in 1974 are no longer binding in 1994 or 2004 or 2014.

The issue is that of commitment to an R & D program for the disposal of wastes on a permanent basis, and I think that the necessary degree of commitment may be precisely what is lacking here in the United States.

Let me close by reiterating that if the AEC merely wishes to expand the present transuranic storage area to include an interim period of storage lasting 30 to 50 years for commercial transuranic wastes, Idaho gives an emphatic "no" to such plans.

If, however, once having removed the transuranic wastes currently buried at the INEL, the AEC then wishes to use its processing plant to reduce, repackage and remove from above the aquifer the nation's commercial transuranic wastes, we in Idaho give a tentative endorsement pending the completion of a detailed and comprehensive environmental and economic impact statement.

In the meantime, it behooves the AEC to move forward in fulfilling its commitment to remove that waste now stored in or above the ground at the INEL.

I would be happy to respond to any questions you may have.

EXHIBIT 15 (Continued)

November 6, 1974

REPORT OF THE

GOVERNOR'S BLUE RIBBON STUDY COMMITTEE

ON ATOMIC WASTES

In summary, the Committee endorses the present waste management activities at the Idaho National Engineering Laboratory as now being conducted in an ostensibly safe and responsible manner that, as interim storage, poses no present threat to the environment. However, based on the inadequate information contained in the Draft Environmental Statement, WASH-1539, we cannot endorse the expansion of activities at the INEL to include the storage of commercial wastes.

The Committee urges the U. S. Atomic Energy Commission to take the following specific actions prior to reaching any conclusion with respect to development of federal repositories for retrievable commercial radioactive waste storage:

1. Reconsider the role of industry in maintaining interim storage of radioactive wastes at the locations where generated.

2. Speed up geological disposal efforts so that wastes now at the INEL and commercial wastes can be removed directly and promptly to permanent disposal locations.

3. Amplify and re-issue WASH-1539 in draft form with adequate time provided for study and comment.

In addition, prior to amplification of INEL's role in radioactive waste storage, the Committee recommends the U. S. Atomic Energy Commission take the following action:

1. Give the State of Idaho a firm commitment on the time schedule for removal of radioactive wastes now being stored at the INEL.

2. Provide fully developed environmental and economic impact statements to the State of Idaho prior to reaching a final decision regarding waste storage at the INEL.

3. Conduct hearings in Idaho on the re-issued WASH-1539 in addition to hearings in Washington, D. C.

4. Arrange for independent environmental monitoring of INEL activities by the State of Idaho.

STATEMENT OF POLICY

In the next decade, the United States must develop increased independence of foreign sources of energy. Success in this program will depend, in part, on a strong nuclear power program. The nuclear power program must be safe, technically complete, economical, and publicly acceptable. Only in this way can the government and industry begin to fulfill the demand for energy. Furthermore, one of the critical features of any energy or power development program is its impact upon the environment. In the case of nuclear power, the radioactive waste must be stored and eventually disposed of in a manner which is safe for the time required for the radioactivity to decay to harmless levels.

The Committee is strongly in favor of developing our nuclear energy resources in order to meet current and projected national energy needs.

The State of Idaho recognizes its responsibility to the entire nation, particularly in view of the present program of radioactive waste management at the Idaho National Engineering Laboratory. Continuation of these important research and interim storage program at INEL will be in the best interests of the national energy policy. The Committee also wishes to maintain the high quality of the environment in Idaho for all times. These two considerations have been paramount in the Committee's deliberations and recommendations and should guide future assessments of public or private power programs in Idaho.

GENERAL CRITIQUE OF WASH-1539

The Draft Environmental Statement, WASH-1539, entitled "Management of Commercial High Level and Transuranium-Contaminated Radioactive Wastes" is inadequate to serve the purposes for which it was prepared and requires revision and re-issuance. The purpose, stated on page 1.1-1, is:

> The basic purpose of this statement is to assess the environmental consequences of developing an engineered surface storage facility for retrievable storage of commercial high-level waste; of evaluating geological formations and sites for the purpose of developing a repository for permanent disposal; and of providing retrievable storage for commercial transuranium-contaminated waste pending availability of permanent disposal.

Criticisms offered with regard to the Draft Environmental Statement follow:

1. Insufficient information is presented therein upon which to assess environmental consequences, evaluate geological formations or evaluate sites for the retrievable storage of radioactive waste.

2. Inadequate justification is provided from either environmental or economic viewpoints for the determination of need for AEC-managed retrievable surface storage as opposed to holding wastes at commercial nuclear locations followed by one-step transfer to ultimate geologic disposal.

3. The report is not well organized and edited. As an environmental assessment, it falls short of addressing itself to the environmental impact of the three types of radioactive waste facilities upon a given site.

4. The stated criteria for assessing a given site have little, if any, relation to the final sites recommended.

5. Major alternatives to interim storage of high-level waste were given but not discussed adequately before dismissal.

6. The report fails to provide a satisfactory total program integration that relates interim retrievable storage to the entire fuel cycle, including fabrication, transportation, ultimate storage, commercial processing factors, and security.

7. The arbitrary assignment of "hulls" to the category of transuranium wastes appears to lack logic, conservation concern or appreciation of differences in handling and storage requirements.

In support of, and supplemental to, this general critique, Appendix A containing detailed comments is provided.

RADIOACTIVE WASTE MANAGEMENT RECOMMENDATIONS

Although perhaps beyond the normal scope of commentary on an environmental statement, but within the context of WASH-1539, some specific recommendations regarding the entire radioactive waste management program are pertinent. These recommendations are as follows:

1. Since INEL has developed the technology necessary to insure safe interim storage at the waste-generating site, the industries themselves should be responsible (by using this technology) for interim storage. This would free AEC to concentrate on the development of the permanent disposal facility.

2. The various radioactive waste categories should be described and evaluated more thoroughly.

   The "high-level" wastes presently have more transuranium content than most transuranium waste.

   The fuel cladding hulls, while referred to as "transuranium waste" in WASH-1539, have very high gamma activity also and must be treated as "high level" during shipment and initial storage.

   The present transuranium wastes, and presumably those generated in the future, are relatively easy to ship but include combustibles which must be stabilized prior to permanent disposal.

   These points need to be clarified prior to arriving at decisions regarding interim storage or ultimate disposal.

3. Accelerated efforts in the development of a viable geologic disposal facility should be pursued. If present technology is available to test the bedded salt concept, every effort should be made to get one geologic disposal facility in operation as soon as possible. The savings in resources, materials, and money could be very significant if a usable geologic disposal facility could be developed prior to 1990.

4. The fuel cladding hulls should be handled separately from the high-level wastes and the more usual transuranium wastes. Consideration should be given to processing the hulls to recover both the transuranium elements and the zirconium. The savings could be at least threefold: a) the transuranics could be recycled as fuel, b) the zirconium could be reused as cladding (following storage for decay of zirconium-95), and c) most importantly, the high-level waste residue would require much less space in a geologic disposal facility.

5. The transuranium wastes should be prepared for the geologic disposal facility while at the commercial waste generating sites. The transuranium wastes should be converted to a compact, non-combustible form which would be suitable for placement in a geologic disposal facility. In this form, these wastes could be retrievably stored at the commercial waste generating site or at any of the present licensed commercial radioactive waste disposal sites pending placement in the geologic disposal facility. The savings in reduction of handling should be significant, and the technology for the interim storage is well established.

6. All retrievably stored waste should be removed to a geologic disposal facility on a specified timetable with consequent phase-out of no longer required interim storage facilities. This timetable should be based on a realistic permanent disposal program. Without such a commitment, an environmental statement cannot be adequately evaluated.

7. The AEC should provide a firm commitment as to the schedule for retrieving and converting to satisfactory form for ultimate disposal the radioactive wastes previously buried at the INEL.

8. The AEC should consider the proposals which have been made for independent environmental monitoring by local governmental agencies. Funding should be provided from revenues derived from the production of the radioactive wastes

9. An accelerated program for partitioning high-level waste to produce a transuranium-free waste should be implemented to assure that the usable plutonium is not irretrievably stored and to reduce the time that the high-level waste must be isolated.

10. The overall waste management program should be accelerated to include the requirement that all shipments from commercial sites be in an environmentally non-reactive form (e.g., glass, cermet, ceramic, or other acceptable forms for high-level and non-combustible for transuranium waste).

EXHIBIT 16

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 18 1976

W. H. Pennington, Director
Office of NEPA Coordination
Energy Research and Development
Administration
Washington, D. C. 20545

Dear Mr. Pennington:

This is in response to your letter of June 29, 1976, to Daniel R. Muller inviting our comments on the Energy Research and Development Administration's (ERDA) Draft Environmental Statement, ERDA 1536, Waste Management Operations, Idaho National Engineering Laboratory, Idaho.

We have reviewed the Draft Environmental Impact Statement and the following are our major comments:

Chapter II, Subsection A

Item No. 3 - Idaho Chemical Processing Plant (Page II-70):

(Page II-122) First set of four bins used to store some 7400 ft^3 of calcined high levels cannot be emptied without significant modifications.

Chapter II, Subsection C

Item No. 11 - Environmental Monitoring Program (Page II-332). In addition to the maps indicating monitor locations, a tabulated summary listing medium sampled, type of analysis performed, lower limit of detection, frequency of analysis, sample collection frequency, and sample location is needed to define the complete existing program.

Chapter III, Subsection B

Item No. 1 - Radiologically Contaminated Airborne Waste Discharge to the Atmosphere (Page III-7):

(Page III-10) Table III-II, does not identify the release of carbon-14 radioactivity. What is the estimated or measured C-14 activity released as airborne waste during 1974?

The impact due to resuspension of surface contamination and movement to other onsite areas or the nearest site boundary locations is not identified in the discussion of soil sampling, radiation monitoring or dose evaluation.

(Page III-41) The noble gas doses should include the individual skin dose as well as the total body dose. The direction and distance to the site boundry location in Table III-III should be given.

(Page III-41) Table III-III should be revised or separated to provide a summary of doses by pathways as shown in Figures III-1 through III-3 for the maximum individual and the population. The maximum individual doses should include total body and organ doses, for each type of effluent release at the nearest locations of concern with applicable pathways identified. The population summary should include doses attributed to noble gas submersion, inhalation, ground deposition, terrestrial foods, drinking water and recreation for all types of effluents released. The population table should also include occupational doses applicable to waste management operations. These tabulations would provide a summary of the doses discussed in section III.b and now being used in current environmental statements.

(Pages III-45, III-47, III-54, & III-55) Milk pathway doses on these pages for the nuclides, I-129, I-131, Sr-90 and Cs-137, are not identified with a specific location. Therefore, it is not clear whether these doses are applicable to an individual at the same location or at different locations.

Summary (Page III-62) The dose commitment due to consumption of vegetables from farm-gardens or residence-gardens adjacent to the site is not discussed or estimated. Inhalation doses for nuclides other than tritium, I-129, I-131, Sr-90 and noble gases appear to be omitted from consideration. If domestic meat or milk animals other than sheep graze on INEL vegetation, how are potential doses assessed?

How was the annual natural background direct radiation dose of 150± 15 mrem determined? The Environmental Protection Agency report (ORP/SID 72-1) on natural radiation exposure shows 124 mrem/yr (including 18 mrem/yr internal exposure) for Idaho and a total background dose rate of 180 mrem/yr is given in the INEL (1974) monitoring report.

Item No. 3 - Radiologically Contaminated Liquids Discharged to the Lithosphere (Page III-70):

(Page III-75) The radioactive liquid discharges for OMRE, SL-1 or ARA are not listed in Table III-XVII and the range of activity was not identified in the discussion. The method of restricting and monitoring resuspension of radioactivity from retired and other ponds, when in a dry condition, is not clear.

EXHIBIT 16 (Continued)

General - It is not clear what assessment is made or needed for offsite river pathway doses (fish-recreation). Figure III-29 and 31 should be produced annually (tritium in ground water).

Item No. 5 - Solid Radioactive Waste Disposal and Storage (Page III-103):

(Page III-107) The monitoring used to evaluate the extent of radionuclide migration from the SL-1 burial site and the ANL high-level waste storage area is not clear.

(Page III-110) The occupational doses pertaining to solid waste operations are not given or referenced.

Appendix C - Calculational Methods (Page C-1)

(Page C-8) The referenced (C-9) NRC Regulatory Guide 1.42 is outdated. Regulatory Guide 1.109 (RG 1.109) is now used for providing guidance on procedures and models for estimating radiation doses to man from radionuclide effluent releases. R.G. 1.109 was developed by the NRC staff as one of a series of guides to implement Appendix I to 10 CFR Part 50.

R.G. 1.109 contains a description of pathways and models used for calculating radiation doses. NRC Regulatory Guide 1.111 describes methods for estimating atmospheric transport and dispersion of gaseous effluents associated with routine releases from light-water-cooled reactors.

If you desire additional information about these comments, please let me know.

Sincerely,

Voss A. Moore, Assistant Director
for Environmental Projects
Division of Site Safety and
Environmental Analysis

cc: CEQ (5)

EXHIBIT 17

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

20 OCT 1976

Dr. James L. Liverman
Assistant Administrator
for Environment and Safety
U.S. Energy Research and Development
Administration
Washington, D.C. 20545

Dear Dr. Liverman:

The Environmental Protection Agency has reviewed the ERDA draft environmental statement for Waste Management Operations at the Idaho National Engineering Laboratory (INEL), Idaho (ERDA-1536) and our detailed comments are enclosed. We would like to thank you and your staff for the time spent in meeting with EPA staff members for briefings and a tour of INEL. These meetings were helpful to EPA in understanding the vast Idaho complex and its waste management operations. Recognizing the scope of the problems and the difficulty of addressing them at a level of detail not heretofore approached, we commend the ERDA and Idaho Laboratory staff on their effort.

The stated purpose of the draft statement was to reassess the environmental impact of the INEL Waste Management Operations program in order to assure that present actions have minimal adverse environmental consequences; to identify those environmental consequences that may not have been fully evaluated at the outset or at each stage of the waste management program; and to serve as a base for evaluating the environmental impact of future actions in relation to the existing environment at INEL. EPA agrees that this is the proper scope for the statement. However, we hope that at the conclusion of the ongoing effort to conduct such analyses for all major ERDA waste management operations, ERDA will prepare a generic environmental statement addressing the long-range program for both interim storage and ultimate disposal of all Government generated high-level and transuranium contaminated waste.

Our review of the draft statement leads us to believe that waste storage operations at INEL to date have not caused an unacceptable hazard to man or the environment outside the site boundary. EPA's

comments are focused upon the more difficult problem of assuring that present commitments and future operations will not result in adverse impacts on the environment or public health.

In its review, EPA has attempted to determine whether the information provided is complete and adequate to support the conclusions reached in the draft statement. In addition, we tried to evaluate whether the current ERDA monitoring program is adequate to determine if contamination is presently reaching the environment (and if so, in what quantities), and if the ERDA monitoring program has the capability to predict the present and future impact of the wastes on the environment.

It is EPA's opinion that the hydrogeologic information presently available could be improved by adding more basic data, interpretive maps and cross sections, and results of past outside reviews to permit a better evaluation to be made of the potential for environmental damage represented by the presently stored waste, either on a short- or long-term basis.

EPA's principal conclusions relative to the adequacy of the Idaho Laboratory waste management operations are that there is a need for more hydrogeological information (as mentioned above); a need to eventually eliminate reliance on soils to remove radioactivity from liquid wastes discharged to the ground; a need to continue to take all reasonably achievable precautions to prevent dispersal of the contained wastes to the environment; a need to ensure that the liquid discharges to the aquifer do not cause the quality of the drinking water supply to exceed maximum contaminant limits specified in EPA's interim regulations pursuant to the Safe Drinking Water Act (PL 93-523), and also to ensure that the liquid discharges will not violate the intent of the EPA Proposed Regulations for State Underground Injection Control Programs (41 FR 36730).

In light of our review and in accordance with EPA procedure, we have rated the INEL waste management operations as ER (Environmental Reservations) and have classified the draft statement as Category

2 (Insufficient Information). If you or your staff have any questions concerning our classification or comments, please do not hesitate to call on us.

Sincerely yours,

Rebecca W. Hanmer

Rebecca W. Hanmer
Director
Office of Federal Activities (A-104)

Enclosure

U.S. Environmental Protection Agency
Washington, D.C. 20460

October 1976

Comments on Draft Environmental Statement

D-ERD-A00122-ID

Waste Management Operations
Idaho National Engineering Laboratory
Idaho
(ERDA-1536)

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I. INTRODUCTION AND CONCLUSIONS

This report summarizes the Environmental Protection Agency's (EPA) review of the ERDA draft environmental statement "Waste Management Operations, Idaho National Engineering Laboratory, Idaho" (ERDA-1536), issued June 29, 1976.

The EPA review has found that the draft statement has not fully described the liquid, solid, and gaseous waste management practices of the nuclear research and testing facilities at the Idaho National Engineering Laboratory (INEL). EPA agrees with the draft statement that environmental impacts observed to date are small from the past 25 years of multicontractor operations of nuclear facilities at the INEL. The Idaho Site, according to the draft, is the interim storage location for transuranic solid wastes, as well as high level radioactive nuclear fuel reprocessing wastes in liquid and solid form. Such wastes are stored awaiting a national policy decision on terminal disposition. Other wastes are present in soil columns and aquifers beneath on-site facilities.

With respect to storage and disposal of radioactive wastes in the lithosphere, the statement reveals the major, relevant aspects of geology, hydrology, and monitoring at INEL. In terms of past activities, the disclosure is reasonably complete and it is apparent that reasonable precautions have been taken. Offsite releases via the surface and subsurface (water) pathways are not reported and, presumably, have not occurred. With the exception of accidental discharges, onsite releases to the subsurface have met applicable standards.

Future conditions of ground water occurrence and quality appear to be reasonably well predicted on the basis of digital ground water simulation models. Concentrations of radioactive materials now in solution or expected to appear seem to be in reasonable accord with ERDA policy.

The following principal conclusions were reached by the Agency in its review of the draft document:

1. Several improvements can be made in the program, and in the draft statement description. Improved description is needed of the disposal of long-lived radionuclides in the unsaturated zone beneath solid waste burial sites and seepage pits, and in engineered storage facilities. Questions about the long-term adquacy, in terms of public health and the impact on the environment, of these practices and/or facilities, some of which involve high-level liquid and solid wastes and all of which involve long-lived transuranics and/or fission products, warrant additional discussion.

2. Past practices of waste disposal involving injection and seepage, despite the generally low activity levels, are not likely to be acceptable in the near future, and some revision in waste management policy and practices appears warranted.

3. Considering items 1 and 2 above, the alternatives, as presented, do not reflect these changing conditions concerning subsurface waste disposal.

4. Further discussion is required on the total impact on underground water resources by liquid waste discharges to the Snake River Plain aquifer. As a Federal Facility using the aquifer for a water supply for its employees, INEL should demonstrate that its liquid waste discharges to the aquifer do not cause its water supply to exceed maximum contaminant limits specified in EPA's interim regulations pursuant to the Safe Drinking Water Act (PL 93-523; 40 FR 34-324) and that its discharges will not violate the intent of the EPA Proposed Regulations for State Underground Injection Control Programs published in the Federal Register on August 31, 1976.

5. Transuranic solid waste and high-level radioactive waste stored in liquid and solid form would constitute a major potential environmental and public health hazard if containment systems at INEL were to fail; therefore, ERDA should continue to take all necessary precautions to monitor and safeguard such facilities.

6. Airborne releases of Kr-85 and I-129 should be subjected to continue monitoring and assessment since annual INEL releases for these radionuclides are significant in terms of proposed EPA Standards for the Uranium Fuel Cycle, and such releases would be subject to these standards in the event that INEL facilities are used to reprocess fuel which has produced commercial power.

7. With respect to dose assessment, with emphasis being given to the pathway models and resulting population doses, we find that further discussion is warranted to present better indication of the radiological impact.

8. There is need for greater discussion of the geologic and hydrogeologic system underlying INEL as it may affect the validity and interpretation of the chemical data presented to describe ground water quality.

9. The draft statement has indicated that many of the INEL facilities are of a developmental nature operative under test conditions where abnormal releases of radioactive materials do occur. Through

proper siting, design for containment, as well as by operational controls such as radiation monitoring, the environmental impact of such abnormal radioactive releases can be limited. Management plans should provide for safe maintenance and decommissioning of experimental facilities.

II. RADIOLOGICAL ASPECTS

A. Transportation

1. The analysis of the risk for transportation accidents is limited to those involving radioactive materials generated by INEL facilities and remaining within the site boundaries. The final statement should include a risk evaluation for all radioactive shipments entering the INEL since an environmental impact assessment should include doses received during transportation of radioactive materials.

2. Accidents involving transuranic waste or high-level radioactivity in fuel element form have not been addressed sufficiently. Also, the presentation of transportation statistics for the INEL site could aid in the assessment of the environmental impact created by the transportation of radioactive materials nationally.

3. On pages III - 138 and 139 the draft statement indicates that the curie content of a release from a transport vehicle accident involving a fire is small compared to the routine release of particulates from stacks at INEL plants. This is too general a treatment of accident consequences and the final statement should be more specific. The environmental radiation dose impact and health effects of 0.31 curies of Pu-239 may differ considerably from 0.31 curies of Mn-54.

4. The statement notes that INEL receives plutonium wastes from the ERDA Rocky Flats Plant. These wastes are then stored in containers designed for 20-year integrity requirements. This short-term storage could be accomplished at the generation site. The final statement should, therefore, address the question of why these wastes are transported to INEL and identify the trade-offs involved between increasing the dose commitment at Rocky Flats and reducing the risk of a transportation accident caused by release of plutonium.

B. Dose Assessment

1. The individual and population dose equivalents in the draft statement for INEL radioactive waste discharges have been presented for a specific

facility, for a particular releases in a single, presumably critical pathway, or at a particular geographical location. A consolidation of dose estimate and projections in a single summary section would be helpful. For instance, a summary chart or table could present INEL boundary (fenceline) individual organ and whole body doses related specifically to radionuclide and on-site airborne sources.

2. The statement calculates and projects the maximum health effects on the earth's population from the INEL waste management operation utilizing the BEIR report in its unmodified form, the most reasonable model to use to calculate health effects at this time, in our opinion. However, total whole body doses and organ doses should be calculated as realistically as possible for those individuals now living nearest the site. The calculation should be repeated for hypothetical situations where individuals could reasonably expect to reside in the future and where the projected dose may be higher.

3. A significant exposure pathway appears to be through contaminated ducks. It is interesting to note that the eating of one pound of contaminated duck could result in a 25 mrem whole body dose and a 20 mrem thyroid dose. Admittedly, few people would be exposed to such a dose. However, we believe the final statement should discuss the means available to keep the ducks away from the seepage ponds or to reduce the radionuclide concentration in the effluent to these ponds.

4. The final statement should discuss the radionuclide sources contributing to the evaluated gamma radiation levels beyond the fenced areas of test facilities at INEL (page III-25). The discussion should indicate what the different effluent control and environmental monitoring systems are, depending on the type of release and whether such levels are from discrete short duration discharges or as a long-term environmental buildup of leakages of airborne or waterborne radioactivity.

5. On page III-32, the resuspension of plutonium in soil within a few kilometers of the INEL (ICPP) operating areas may result in an exposure pathway significant for grazing animals or humans present only during periods of low airborne plutonium concentrations. Though probably not a major or primary pathway, the resuspension pulmonary dose should be estimated. Similarly, the plutonium resuspension situation at the site boundary should be discussed in the final statement.

6. The limit for I-129 is 5 millicuries/gigawatt-year. This limit, though not directly applicable to INEL operations, can be compared to the ICPP average annual release rate of 100 millicuries and the maximum value of 7,000 millicuries given by the draft statement. These releases would be the same as the potential releases to the environment from the fuel of twenty to fourteen hundred 1,000 MWe nuclear LWR's. The final statement should discuss these comparisons and indicate what ERDA is doing to reduce these release quantities.

7. On pages III-44-45, it is stated that an adult would receive a yearly dose of 2 millirem from I-129 to the thyroid if he consumed 80 kilograms of meat per year obtained from animals slaughtered after grazing in areas of highest contamination. The final statement should include some discussion of the numbers of individuals receiving such a dose.

8. The projected dose equivalent to members of the general population should preferably be in units of mrem/year; i.e., as in current generic environmental standards, and as radiation "dose equivalent" as defined by the International Commission on Radiological Units and Measurements. The impact for the INEL 1974 operations is given in the draft statement as 2.0 manrem. Although the pathways considered are discussed, there is no explicit presentation of the population dose by nuclide released and by pathway. Nor are there concise presentations of the dose to the "maximum" individual, or of population organ doses. Table III-III on page III-41 is not complete. Tables III 1-15g and III. 1-14i of ERDA-1538. (Waste Management Operations, Hanford Reservation, Final Environmental Statement, December 1975), are good examples of such summary tables. On page III-120, Table III-XXV, the population dose is given as 7.7 man-rem, while on page III-121, and throughout the document this value is listed as 2.0 man-rem. The final statement should resolve these discrepancies. Table III-XXV also shows organ-rem doses of 8.5 and 43 man-rem to the lung and thyroid, respectively. These values further point up the need for INEL to use tabulated data to summarize the impacts.

9. The titles of Tables III-XXV and IV-XXIX should be revised to read respectively: "Estimates of various health effects within a 50-mile radius from the dose received during 1974 from the releases occurring in 1974"; and, "Estimates of potential health effects on the earth's population from INEL waste management operations for a 100-year period following the release".

C. Gaseous Waste Management

1. On page IV-1, the release of krypton-85 into the atmosphere from INEL operations is reported as 253,900 curies for 1974. EPA has proposed a Kr-85 limit of 50,000 curies per gigawatt-year for the normal operations of the uranium fuel cycle to be effective in 1983. By 1983, the U.S. commercial fuel reprocessing capacity is expected to be able to handle the equivalent of about 40 gigawatts of nuclear power plant capacity per year. Thus, the commercial reprocessing industry would be limited to 2,000,000 Ci/yr of Kr-85. In actual practice, the release would be expected to be substantially smaller, perhaps 200,000 Ci/yr. At current levels the INEL environmental release of this radioisotopes would, in comparison, be significant.

The final statement should address control of Kr-85 releases by INEL. In addition, because carbon-14 releases are generally anticipated to be more significant than Kr-85, a full treatment of C-14, including its world-wide dose commitment and alternatives for control, should be presented in the final statement.

2. An 18-year record of the airborne waste volumes and total radioactivity released through the ICPP stack is presented in Section III of the statement. Recognizing that earlier data will not permit a breakdown of individual radionuclide data by source within the facility, EPA believes the final statement should include a more explicit presentation of individual contributing air flows and the radionuclide composition which would permit a better understanding of possible peak values in the ICPP stack effluent concentrations. Some discussion of the current techniques for calculating the annual average stack discharge values would be helpful for the final statement.

3. Page II-25, table II-1 indicates a considerable range of annual radioactive airborne discharges at ANL-WEST. Though not indicated in the draft statement, would not remote indication of individual facility radiation unit alarms at a central INEL location provide warnings of airborne or waterborne releases? This might permit more effective institution of protective actions such as evacuation of people or diversion of high-level waste streams from environmentally sensitive pathways. Additional information in the final statement on possible use of such direct warning instrumentation would be helpful.

D. Transuranic and Solid Waste Management

1. On page 111-5, the discussion of flooding should be expanded to consider the interaction of buried radioactive waste with repetitive inundation. Although the draft statement does later address this subject on page III-106, stating that contaminants have moved only a short distance (that is, a few inches past the interface between the soil and the wastes) after flooding conditions, repetitious flooding and various burial procedures should be considered. In addition, some estimate should be made of the degree of retention of radionuclides by the various physical barriers as well as the extent of migration into soil domain and/or ground water, in the extreme flooding conditions.

2. On page III-13 and page II-333, the planned soil sampling survey should provide additional information on the long-term environmental impact of INEL operations. The development of soil radioactivity profiles in terms of specific radionuclide content with depth would illustrate the environmental impact of INEL operation in comparison

with weapons fallout, providing such data are available. Soil profile sampling could utilize existing locations of a sampling grid determined from meteorological records and operational information on release quantities.

3. Insofar as some of the burial sites receive snowmelt runoff and there is little geologic data for some of the older burial grounds, it would be helpful if a list of the studies of radionuclide migration which have been made for all of the burial grounds (active and inactive) at INEL would be presented in the final statement.

4. Independent studies at INEL burial sites showed that plutonium contamination moved downward beneath land disposal areas. Breakthrough of Sr-90 in soils below seepage pits has also been experienced. The final statement should specifically explain such migrations/breakthroughs in terms of occurrences, locations, potential for repetition elsewhere. More information is needed on the underlying data base and knowledge supporting such operations, and the nature of monitoring programs in the unsaturated zone. Movement of radionuclides from any of the burial grounds is a major concern of the EPA and should be thoroughly addressed, particularly considering that most of the wastes at RWMC to date are nonretrievable (Table II-LV).

5. Page II-220: The RWMC monitoring well network of five wells, 27 shallow probes, one surface water station, and moisture sampling pipes does not seem adequate to monitor a burial facility of this scale and containing the quantity of long-lived radionuclides stored (93,525 Ci) or disposed (5,978,000 Ci). Presumably, more sophisticated monitoring programs are available or exist and these should be described, along with a summarization of sampling results.

6. Page II-214 to page II-222: The distinctions between the TSA, TDA, SDA, Trenches, Pits, and Asphalt Pads, all of which are part of the RWMC, are not particularly clear. Perhaps a simplified map and a table to identify the location, contained waste volume/activities, monitoring systems, etc., can be included in the final statement to show the association of these facilities to each other within the RWMC and in relation to other solid waste facilities at INEL. The monitoring network for all facilities and the results of such monitoring to date should be described.

7. Investigations of radionuclide migration in the RWMC have been completed and the results are summarized. What continuing program of monitoring is underway? With respect to flooding from snowmelt and rainfall in 1962 and 1969, were such incidents anticipated in site selection and operation? How are siting criteria for waste disposal developed at INEL? What is the significance of such flooding events at seven-year intervals on the long-term performance of all burial sites and soil-retained radionuclides beneath seepage pits?

8. Page II-230 to page II-233: The ANL Radioactive Scrap and Waste Facility reportedly contains about 10 million Ci of activity emplaced in a 10-year period, i.e., an average of 1 million Ci/year. Is 1974 a typical year as far as radionuclide distribution considering that only 91,536 Ci were emplaced? If the amount of activity is only 20 percent of "average", the distribution of radionuclides for 1974 (table II-LVI) may also be atypical. Regardless, the emplacement of 9.5 million curies in presumably ordinary carbon-steel pipe at or slightly below land surface could lead to environmental releases in the future. Past experience with mild steel pipeline corrosion and the special precautions taken to avert similar problems and assure retrievable storage (for 20 years) of transuranics at RWMC, leads one to reject the concept at ANL unless long-term storage is specifically not intended. The conditional statement (page II-232) that "prolonged life can be expected under indentical exposure conditions" is presumptuous of variability found in nature. The final statement should also include this facility in the map series showing gamma radiation intensities at various facilities (page II-18 to III-31).

9. Considering the very high concentrations of activity (100,620 curies in 75 ft^3) in solid waste stored at ANL-W for 1974, more information should be presented in the final statement as to how the material is stored, and whether this part of the waste management program can be improved. It would seem (table II-IX) that 2,200 ft^3 of wastes containing some 9,500,000 Ci should receive greater discussion than is evident in the draft statement. The operation of the solid waste systems described on pages II-46 through II-50 should also be related to the operation of the other solid waste burial/storage facilities at INEL. For example, how does the ANL-W and other solid or liquid radioactive waste management systems relate to the INEL Radioactive Waste Management Complex (page II-51).

E. Accidental Releases

1. Section III. C. 3. discusses radioactive liquid waste transfer line leakage. In EPA's opinion, the use of an incident that has already occurred (item 27, Appendix B) in the draft statement as the maximum leak that could be expected, does not include a satisfactory degree of conservatism. This leak resulted in the discharge of 14,000 gallons of the high-level waste and 30,000 curies of Cs-137 and Sr-90. Certain sections of the waste lines would therefore appear to be the

weak spot in INEL's waste management system. In view of this condition, the final statement should include a more detailed description of the waste lines and an evaluation of the probabilities of similar or greater leaks in the future.

2. Analysis of the impact from an abnormal condition uses the rupture of a HEPA filter at WCF as the "worst-case accident" (page III-126). This rupture would result in the release of about 300 curies of mixed fission products. However, in the discussion of past releases, page B-3, number 10, there is a release of 1,200 curies of fission products from the Fuel Element Cutting Facility at ICPP. No other mention of this facility was noted in the draft statement. Is it still operational? If so, would not the rupture of a HEPA at this location be the suitable "worst-case accident"?

3. Past radioactive waste disposal practices were apparently inadequate at the chemical processing facility. For example, land within a kilometer of the ICPP (figure III-9) and the TRA (figure III-9) Facilities are contaminated to a gamma exposure level of more than 100 mrem/year. The final statement should indicate what the current waste management practices are which will prevent these high values during future operations.

F. Additional Radiological Comments

1. Page I-2, last sentence: The phrase "most of the radionuclides" infers that the number of radionuclides trapped by absorbing layers is an adequate evaluator of the effectiveness of ponding radioactive wastes in protecting the environment. The final statement should emphasize containment of all radionuclides capable of increasing the environmental radiation dose levels to individuals or populations.

2. Page I-11: The last paragraph indicates that tritium and strontium are "the principal radioisotopes released in solution". It should be emphasized that the term "principal" means no other radionuclide is at a higher fraction of the value of the Federal or State standard for concentrations released to uncontrolled areas. Some clarification of the relative importance of radionuclides as fractions of release limits or in terms of annual organ or whole body dose should be included in the final statement.

3. Page II-116: The ICPP discharge well monitoring system includes both gross beta and gamma scintillation sensors and the collection of a daily sample composited for monthly laboratory analysis. The draft statement does not indicate whether plutonium or other transuranic determinations are made. Some assurance of the absence of plutonium or other transuranics in the ICPP well

discharge seems appropriate either on the monthly composite sample or by some other suitable monitoring procedure. The final statement should address these concerns.

4. Page II-118: How do the major pH changes effection sorption assumptions?

5. Page II-152: The use of the LOFT Facility for testing of a reactor safety system involves an abnormal release of gaseous radionuclides which will be separately monitored by the ERDA Health Services Laboratory staff. EPA concludes that additional gamma or beta/gamma detection devices (mobile or stationary) are needed for in-plant radiation monitoring to provide improved real-time monitoring of planned and accidental gaseous releases from the numerous test facilities. Some discussion of this point in the final statement would be helpful.

6. In reference to page III-61, the long-lived radionuclide I-129 has been reported as a source of thyroid radiation dose to antelope in the Idaho area. Although no effects in the health of individual grazing animals are expected from the current INEL releases, a continuing record of I-129 levels in an appropriate biological indicator sample such as the antelope thyroid can serve to document the extent of environmental buildup.

7. On page II-93, the concentration of tritium at the point of discharge to the ground water for 1974 at INEL is reported as 3.2×10^{-4} uc/ml or 320,000 pCi/liter. This value is 16 times the EPA limit for this radionuclide in a public water system (41 FR 28402). The average concentration of tritium at the CFA production well, presumably a drinking water source, was 70,000 pCi/liter-a value which also exceed published EPA maximum contaminant levels for tritium. Also on page III-94, a mean concentration of dissolved solids of 500 ppm at the point of discharge to the aquifer is reported and indicated as meeting a water quality standard. The final statement should include discussion of the potential radiation dose from these levels. Also the comparison of these releases to EPA's interim regulations and how ERDA intends to reduce these release quantities should be discussed.

8. Page II-332. Where can summaries of the environmental monitoring program be found? A summary of the 1974 report should be included in the final statement.

9. Page III-122. Subparagraphs "b" and "c" appear to be identical. From tables II-XXVIII and II-XXIX, should 2020 be 2000 in subparagraph "b"?

III. HYDROGEOLOGICAL INFLUENCES ON ENVIRONMENTAL IMPACT

A. General Comments

1. In general, the draft statement describes activities of the facility in terms of waste disposal and defines past environmental consequences of these activities. It is apparent that considerable planning and research supports an overall conservative system for discharge of wastes into the regional aquifer. Discharge is essentially limited to tritium and concentrations that are within established guidelines. It is other, long-lived and more toxic radionuclides disposed of into the unsaturated zone via seepage ponds, that are of greatest concern. Considering the technical constraints and state of development of predictive techniques, the draft statement is a commendable effort in disclosing future consequences of continuing the operation, even though it is admitted that existing predictive models cannot look far enough into the future when dealing with these types of wastes. Although tritium is the dominant radionuclide (in terms of activity) introduced to an aquifer, twice as many curies are introduced to the unsaturated zone where no model is operative or in development. The final statement should discuss such a waste disposal practice and whether further evaluation is needed of the monitoring program to assure adequacy in sampling locations, parameters, and frequencies. As a long-term environmental safeguard, predetermined limits should be established for each parameter at each monitoring site. When these limits are reached, that particular waste disposal site must be abandoned and proper restoration steps taken.

2. Insofar as the natural hydrogeologic features of INEL have a direct bearing on the waste disposal operations and vice versa, the discussion of such features (pages II-291 to II-311) needs to be expanded in the final statement. Incorporation of study findings, not referred thereto, should be made. The draft statement does not present an adequate disclosure of the natural features incorporated into and depended on for waste management. The statement needs additional hydrogeologic information to allow technical reviewers sufficient chemical data, maps, cross sections, etc. to better understand natural and contaminated conditions in the subsurface.

3. On page II-333, it is stated that "reports on the USGS monitoring program are made periodically, yet only one report covering an 18-year period from 1952 to 1970 is indicated. Are other reports available? On the same page it is stated that "a limited number of samples of INEL soil have been obtained and analyzed for radioactivity".

How many samples are available and what are the analysis parameters? What is the relationship of such sampling and analysis to the use of unsaturated soils for sorption of radionuclides? This extremely important aspect of the INEL waste management program should be more fully covered in the final statement.

4. On page II-37 the statement, "if the ICPP continues to release ...it balanced by the yearly loss due to radioactive decay", raises numerous questions. How much of an increase and over what time period can this be expected? What will the long-term prospect be for contamination of underlying bedrock (saturated and unsaturated zones)? What are the attendant long-term monitoring and land use controls?

5. The statement should include ground-water monitoring data, other than those appearing in the contour-map illustrations. Specific information on the quality of effluents and ground water likely to be affected or already affected by seepage ponds, industrial waste ponds, and injection wells, should be discussed in the final statement. The quality of potable supplies relative to natural (unaffected by waste disposal) quality should also be addressed. The sections on ground water monitoring programs, per se, conducted in support of the many waste disposal operations should also be enlarged.

6. On page II-44, Table II-V, the concentration of dissolved oxygen in the final effluent for September is unrealistically high. The EPA National Eutrophication Survey revealed that maximum dissolved oxygen concentrations in most lakes range from 10 to 13 parts per million, which is normal for aerated surface water bodies. The values of 37.5 ppm (Table II-V) appears anomalous and should be discussed.

7. Table II-XI, page II-62 states that 92.1 percent of the non-tritium bearing effluent fractions released to NRF seepage basins consists of long-lived C-14 and unidentified beta-gamma emitters. The final statement should discuss what improvements seem warranted in the analytical effort, and/or long-term management, due to biologic recycling of C-14 and long half-life.

8. On page II-170, for the Power Burst Facility (PBF) liquid waste discharge: How do the concentrations of radionuclides with half-lives of less than 30 days compare to the concentration guides for drinking water. Also, what volume of radioactive effluent will be discharged during an average year of operations?

9. The statement on page II-118 "The concentration of chemicals released to the discharge well is below maximum concentrations allowed in State and Federal standards for drinking water as shown in table II-XXVII", does not seem consistent with concentrations shown in table II-XXVI. The final statement should clarify this.

10. On page II-158, the statement "...dispersion of the waste water in the aquifer is expected to further reduce the tabled concentration" is contrary to the intent of the Safe Drinking Water Act with respect to ground water in which the subsurface is used as part of the waste treatment. The same concept holds true for waste heat on page II-162.

11. The quality of the nonradioactive waste from the PBF should be discussed (page II-173). Removal of contaminants by ion exchange should not be the method of waste treatment.

12. On page II-193: The final statement should indicate what the volume of discharge is from the retention basin at TRA. Also, state what radionuclides are present and the activity of each.

13. The last sentence on page II-194 incorrectly infers that all radionuclides are retained in the soil beneath the leaching (seepage) pond. For example, in 1974, Cr-51 and H-3 constituted 1,584 curies or 88.4 percent of the total inventory. Both radionuclides are particularly mobile and could be expected to reach the water table. The final statement should address the following two concerns. First, release of radionuclides to the water table should be justified with respect to the intent of PL-93-523. Secondly, future mobility of radionuclides in the soil column should be ascertained.

14. On page II-199 the use of the injection well for disposal of nonradioactive wastes introduced (up to September 1972) large quantites of hexavalent chromium to the basalt aquifer and a large plume of chromium-contaminated ground water developed. The final statement should comment on the current extent and concentration of chromium-contaminated ground water and why a well is used versus a seepage basin. What was the chromium concentration and total quantity previously injected? What are the adverse effects, if any, of chromium contamination present in the aquifer as a result of disposal operations?

15. On page II-200, the statement, "This has resulted in an increase in the concentration of dissolved solids in the ground water in the immediate area of the pond", should be fully explained. In addition what data are available and what is the quality of the nonradioactive waste?

16. Pages II-278 to II-283: Evaporation data should be supplied. It would also be useful to discuss the principal recharge sources and mechanisms affecting replenishment of the soil moisture zone and the regional aquifer.

17. Page II-297: "...900 feet to the southeast" should be southwest.

18. On page II-302, the statement "The most significant body of perched water resulting from waste disposal occurs at TRA beneath the waste seepage - ponds" should be further explained. What is the quality of water in the perched zone, how does it affect the aquifer, etc.?

19. On page II-305 the statement, "The chemical content of the water indicates from which pond the water is derived" should be explained and relevant analytical data provided.

20. On page III-72, there is a sizable discrepancy between the 1964 data in table II-XXVI for total activity released (2,640 Ci) at TRA and ICPP and the 3,998 Ci reported in the Hydrology of NRTS Annual Progress Report for 1965 (page 79). This should be clarified in the final statement.

B. <u>Waste Storage/Disposal in the Hydrogeologic Environment</u>

1. In our opinion there is a need for greater discussion of the geologic system underlying INEL as it may affect the validity and interpretation of the chemical data. Nace et al., (1959, page 72) note in their discussion of the variable specific capacity of wells that great differences in aquifer transmissivity occur through very short vertical distances. At NRF, one well had a specific capacity of 16 (gpm/foot drawdown) at a depth of 485 feet. When the well was deepened to 535 feet, the specific capacity was 2,860. It follows, then, that certain highly permeable zones account for essentially all of the transmissivity present. Therefore, how realistic are the chemical data from a well penetrating several or many such zones in describing the maximum concentration in a specific zone versus the average concentration over many zones? Work by Jones (1961, page D-375) revealed that chloride differences of 70 to 80 mg/l were observed in different zones of the same well when sampling involved

use of a straddle packer or piezometers. For radionuclides, in particular, maximum concentrations are certainly of interest. Peckham (1961) noted that sampling involved with a bailer versus a thief sampler introduced a large source of error. He also mentioned (page 161) that Ru-106 detected in the CPP area was recirculating from the disposal well through the upgradient production wells as a result of heavy pumping and injection via the upgradient disposal well. The final statement should include these discussions and address their relationship to EPA's concern.

2. The dilution, to date, as typified in the chemical quality maps (page III-80) may be apparent rather than real in terms of the total interval (aquifers and aquitards) sampled. Jones and Shuter (1962) noted that the tritium data were indicative of more dilution than was originally thought. Is this the case or are the contaminants localized along highly permeable zones, particularly between principal lava flows? The latter is reported by Peckham (1961). The indication in the draft statement is that concentrations of Sr-90, Co-60, H-3, etc. in the monitoring wells are relatively constant. If this is not the case, the final statement should include some discussion of this variability and a comparison to applicable standards.

3. Considering the assumptions embodied in the theoretical approaches, (Theis nonequilibrium formula, Thiem formula, and Jacob formula) to determining aquifer constants, there is need to explain the application of such techniques to INEL where wells are only partially penetrating and where aquifers are not homogeneous. Permissible distances between disposal and supply wells (Nace, et al., 1959) have been determined using variations of these formulas, yet Nace, et al., (1959) noted that the "real margin of safety, if any, is indeterminable" and that "if pumping and injection patterns change, there is need for recalculation". Considering the changing patterns of pumping at TRA and NRF (Barraclough and Jensen, 1976) the final statement, should include some discussion of the effects, if any, on withdrawing potable water and injecting waste water into the same aquifer.

4. The labeling of the disposal well at ICPP as "deep" is misleading. By comparision with 383 industrial disposal wells across the country (Louis Reeder & Associates, Tulsa, Oklahoma; personal communication) 71 percent of which exceeded 2,000 feet total depth as of January 1975, the ICPP well is quite shallow. Furthermore, there is only 140 feet of penetration, not into deep saline or brackish water, but rather into the regional water table which is one of the most prolific aquifers in the United States. Therefore, waste dilution and dispersion is the chief feature of the "disposal" scheme. It is far more the convention in

industry and in regulatory agencies to consider "disposal via wells" as introduction into reservoirs of unuseable fluid with little chance of migration into potable supplies. The average content of total dissolved solids in the injection zone for most industrial waste disposal wells in the United States is over 10,000 mg/l versus 200 mg/l at INEL. The final statement should address this concern.

5. Schmalz (1959, page 1-2) reported that for the ICPP injection well "until July of 1958 the radioactivity involved consisted mainly of iodine-131 with a daily average discharge of 0.8 curie with a peak of 38 curies". He also stated that:

> " Monthly average liquid concentrations for isotopes with a half-life longer than ten days were maintained at less than three times the maximum permissible drinking water concentrations for continuous use, with the exception of a period from December 1958 through February 1959 when solutions containing strontium-90 were discharged which exceeded the maximum permissible concentrations as much as 225 times (December 9th). The average for the month of December (1958) was ten times MPC. These releases were unintentional and were caused by a leak which at the time was of unknown origin in the plant system. The release of December 9th consisted of a "slug" of approximately 29 curies composed of 24.8 percent total strontium, (sixty percent of which was strontium-90); 50.2 percent cerium-144 and praseodyminum-144; 14.3 percent zirconium and nioblum-95; and 10.6 percent cesium-137. This release was detected in the monitoring wells...."

In contrast to the above findings from an earlier study, the draft statement (table on page II-115) reports significantly less activity for 1953 through 1957 (346 Ci or 0.24 Ci/day). The same is true with regard to accidental discharges from December 1958 through February 1959, when Sr-90 exceeded MPC by an average factor of 10, with one "slug" containing 29 Ci of long-lived radionuclides. This accidental release is not mentioned in Appendix B. These disagrements should be resolved in the final statement.

6. Although it appears that the Big Lost Creek diversion works reduce the flooding problem with respect to the INEL operations, the final statement should contain one or more illustrations of the extent of flooding for floods of various, credible return periods, including as a minimun the Standard Project Flood of the U.S. Army Corps of Engineers. Included in the related discussion should be an estimate of flow velocities and the duration of inundation for those parts of the INEL affected.

7. On page II-292, the discussion of the threat of flooding from Birch Creek to facilities at TAN should be expanded in the final statement. Does the runoff in 1969 represent the 10-year flood or the 50-year flood? What facilities are affected and in what way? The present discussion of flooding should be more closely related to effects on INEL facilities and operations.

8. There does not seem to be any mention of the catastrophic failure of Mackay Dam and its effect on flooding, even taking into account the diversion works. Recent dam failures underscore the absolute necessity to consider such events, however improbable according to current estimates. The final statement should include an analysis of the failure of Mackay Dam in terms of immediate flooding impact and longer term, ground-water recharge effects. Nace, et al. (1959) has stated that "failure of Mackay Dam would unleash a serious Flood".

9. On page II-287, a conflicting statement appears in the discussion on seismology as compared to earlier sections of the statement. It is stated the INEL is in a Seismic Zone 3 of the Uniform Building Code of the International Conference of Building Officials. Rather than being "aseismic" as stated on pages II-96 and II-291, this is in fact a higher risk classification than Zone 2 which prevailed prior to 1970. Pages II-123 and II-96 also indicate that a maximum credible earthquake of 7-3/4 (Richter Scale) near Arco would produce ground acceleration in the calcined waste storage facility of about 0.33 g. The final statement should clarify these apparent conflicting statements. Potential damages from such ground motion are discussed (page II-124), hence the "aseismic" status is questioned. Work by the U.S. Geological Survey and reported on by Nace, et al. (1975) does not support the inferences in the draft statement that INEL is free of major seismic risk. Figure II-61 on page II-288 indicates that INEL is in a Zone 3 seismic risk zone and that major damage from earthquakes can be expected. The conflicting remarks concerning the seismic risk hazard to INEL facilities and operations needs further discussion. Considering: (1) the proximity of high-level wastes (liquid and calcined) to saturated, highly permeable bedrock; (2) the inability to precisely predict earthquake occurrences in space, time and intensity; (3) the meager factor of safety in engineered structures (see page II-94); and (4) the assumptions and shortcomings in theoretical evaluations of structural responses (see pages II-94 and II-124) considerably more testimony from outside experts, including the U.S. Geological Survey, is strongly recommended.

10. The final statement should include a discussion of the environmental impact from the calcined waste solids in the storage bins concerning the potential influx of water from rain or snowmelt,

although evidently none has entered to date. In the case of the liquid waste storage tanks (page II-101) this was deemed a problem.

11. With respect to long-term stability of the stored wastes, should inflow of water occur, it is mentioned (page II-124) that transuranic nuclides would be of concern. However, transuranic concentrations are not shown as a "typical" property of the wastes in table II-XXIX. The final statement should indicate which transuranic nuclides will be of concern. Finally, the blanket statement that "absorption of transuranics by soil materials from the ground and/or surface water would prevent serious biological hazard to mankind" is highly speculative and heavily dependent on release conditions, land and water use patterns, and many other natural and man-related factors. This statement should be expanded further.

12. The draft statement contains essentially no mention of whether or not recharge results from precipitation or snowmelt within the reservation boundaries. The NAS Committee (1966, page 71-72) was particularly concerned with the validity of the "dry soil" zone concept and recommended that numerous additional studies be made. The conducted studies and their influence on the continuing reliance on sorption in the unsaturated zone should be developed in the final statement.

13. Page III-77, the indication of a strontium breakthrough at the TRA seepage ponds raises important concerns: (1) Beneath the regolith, the predominant material is basalt, not "strata of soil-like, unconsolidated material in the basalt", as stated in the draft statement. Basalt has essentially no sorptive capacity compared to soils and particularly clayey soils. The final statement should correct this misleading inference concerning the ability of basalt to retain radionuclides. (2) The statement "the capacity of these underlying materials to 'sorb' strontium has apparently not been exceeded" infers that great sorptive capacity is present. Although strontium has not been detailed in the aquifers, to date, there is need for evaluation of future conditions, too. The final statement should give a more definitive assessment of strontium distribution, migration rates, sampling data, potential for migration, influences from flooding, and sorptive capacity of regolith and basalt interflow materials.

14. Similarly, the final statement should give an assessment concerning the Co-60 retention in paragraph 3 of page III-77. It would be expected that other fission products such as Ce-144, Y-89, and possibly other less common elements may also present difficulties. There seems to be very little understanding of radionuclide retention beneath the TRA seepage ponds under present conditions.

What role future events may have or what is to be expected even if present conditions prevail is not at all clear.

C. Waste Discharges and Aquifer Protection

1. Although there is some discussion of accidental discharges from leaking pipelines, there is no comprehensive treatment of the pipeline corrosion situation. The detailed report by Paige (1972) revealed that buried piping surrounded directly by soil has an expected lifetime of 10 to 20 years. Leaks of less than 100 gallons per minute would be difficult to detect insofar as the capillary rise is insufficient to get fluids above the burial depths of five feet or more (to prevent freezing). In other instances, lines are buried beneath pavement, and in still other cases, the lines are used infrequently, thereby complicating monitoring by direct means or through materials balances. The high level waste lines to the hot waste storage tanks at TRA are a case in point. Paige (1972) indicates that the accuracy of volume measurement for materials balances at the TRA tanks is poor and an improved system was proposed. The final statement should indicate whether this system was installed and the status of pipeline corrosion, leaking, and monitoring as part of the INEL operations. Also what improvements in the way of pipeline enclosures and construction, cathodic protection, corrosion testing, leak monitoring, etc. have been implemented as a result of the 1972 study?

2. Many of the liquid transfer lines are doubly encased lines with monitored sumps. Throughout the draft statement, it is implied that the only monitoring for the leaks of the primary lines is by monitoring the sumps in the secondary encasement. However, accidental releases 26 and 27, pages B-6 and B-7, occurred with no apparent detection by the sump monitors. The final statement should indicate whether doubly encased lines were used; and if so, how effective is sump monitoring when these quantities of liquid can be released undetected. Are there other, similar transfer lines being used at present? Would not periodic hydrostatic testing be indicated for all transfer lines?

3. A significant leak from a corroded carbon steel waste line resulted in the discharge of 14,000 gallons of high-level waste and 30,000 curies of Cs-137 and Sr-90. Certain sections of the waste lines would therefore appear to be the weak spot in INEL's waste management system. In view of this condition, we feel the final statement should include a more detailed description of the waste lines and an evaluation of the probabilities of similar leaks in the future.

4. On page II-104 the draft statement indicates that the future anticipated liquid wastes will contain increased radionuclide concentrations. We would like the final statement to address whether the existing tank farm and associated piping, coolant systems, and monitoring apparatus are suitable for handling the waste concentrations and volumes of liquid wastes anticipated in the future. How much of an increase in volume and activity is expected?

5. Pages II-90 to II-101 describe the ICPP high-level radioactive waste tank farm of nine 300,000 gallon tanks and two 318,000 gallon tanks of which only eight are equipped with internal cooling. The final statement should address how much reserve capacity with cooling and without cooling is continously available, and are these reserves adequate in the event of leaking tank(s).

6. On page II-99, the description of the method of sampling the sumps seems extremely crude in relation to the importance of determining if a tank is leaking. The final statement should indicate whether there has been any leakage from the tanks to the concrete vault and the vault to the underlying basalt. Also, if a leak is discovered in any of the tanks and emptying is required, what minimum period of time is required, assuming a full tank?

7. As a result of a brief study in 1970, the U.S. Public Health Service (PHS) was rather critical of the practice of mixing 1,000 cpm/ml or higher aged hot wastes with other waste streams (at TRA) to meet discharge standards. The final statement should indicate what changes in practices has occurred and if no changes were made, what was the justification. In the same study, the PHS was critical of the INEL policy of wastewater seepage/injection because it did not conform to State of Idaho regulations and Executive Order 11507 to reduce pollution to a minimum. They were also critical of the permissive attitude of not including deterioration of water quality as a form of water pollution. How have these practices changed and how is the continued discharge of wastewater into the subsurface justified?

8. The PHS (1970) noted that certain radionuclide concentrations in perched water beneath the TRA ponds equalled that in the open ponds, indicating that the sorptive capacity of the alluvium is much reduced. In 1966, the use of seepage ponds which received 10 percent of the CPP wastes was discontinued when Sr-90 reached 10 uCi/ml in nearby monitoring wells. At the TRA seepage ponds, sorption data showed that only 1.6 Ci of Sr-90 were in the alluvium whereas 22 Ci were disposed of. The PHS (1970) concluded that Sr-90 was not well retained in the alluvium at TRA and that the empirical approach for pond utilization needs reevaluation and monitoring.

These studies and their relation to the continuing practices should be discussed in the final statement.

9. On page III-82 the draft statement indictes that sufficient Sr-90 was injected to raise the ground water concentration to 0.2 pCi/ml (66 percent of the guide for drinking water). The final statement should address how this policy or decision to inject aligns with ERDA guidelines for waste disposal. If the seepage discharge of 1962 or 1963 is the cause of this elevated level of strontium, how is this done in regard to ERDA discharge policy? Was the pit in question normally used for radioactive waste? Was the soil mantle so thin that excavation for a new building resulted in removal of all soil and containd radioactivity (6 curies)? How much Cs-137 was contained in the sediments? Why was a new building located above the old seepage pit?

10. The final statement should address why other accidental releases (to the ground) at ICPP (see pages B-2 through B-5) weren't considered in the ICPP impacts on water resources (pages III-81 through III-88). Also, what effect has the accidental release of long-lived transuranics to the injection well or seepage ponds had on ground-water quality?

11. On page III-71 the ERDA policy for low level waste discharge or burial lacks the critical element of time during which a person should not be exposed. Thus, decisions which are adequate over a short time period may be lacking in the long-term. Similarly, the policy statement on page III-93 indicates that dilution and dispersion are relied upon. The final statement should address these policies and their relationship to the potable water contamination mentioned on pages III-106 and III-107.

12. At the ICPP (pages II-118), low volume-highly concentrated wastes from the Service Building is mixed with the low-level radioactive wastes and is discharged to the disposal well. This concentrated waste stream is in the order of 5.7 million gallons per year. The final statement should discuss the alternative of using surface ponding of this small volume of highly concentrated chemical waste. A lined pond of a few acres in area should be adequate to eliminate any recharge to the aquifer from this source. Administrator's Decision Statement No. 5 (F.R. Vol. 39, No. 69, page 12922-23, April 9, 1974) provides EPA's policy on subsurface placement of fluids. The discharge of chemical wastes directly into an aquifer when there are reasonable alternatives is in conflict with EPA policy.

D. Commitment of Resources

1. The draft statement (pages I-12 -I-14) considers only the actual land area used for waste management structures and disposal sites as the land commitment. A far greater amount is involved when the subsurface area or volume of contaminated soil, rock, and water is properly included. It is EPA's opinion that the statement on page I-16 "with the exception of those small areas dedicated to waste management..." does not consider the many future uses which are denied because of wastes in the aquifer or unsaturated zone, and that this area is greater than 210 acres. For example, irrigation and resulting return flows might seriously, adversely affect the retention of sorbed radionuclides. A hint of this larger commitment can be found on pages III-2 and III-5 where it is inferred that public use of INEL land may not be realistic. Therefore, we believe the final statement should expand on the larger commitment.

2. The section on solid waste states that the total land area currently committed to burial or storage of solid radioactivity contaminated waste is about 125 acres (page III-105). This is inconsistent with statements made elsewhere, e.g., p III-104, 158 acres; p II-14, 210 acres. Furthermore, the seepage basin and evaporation pond areas underlain by soil/rock columns containing sorbed or otherwise retained radionuclides are, in effect, burial grounds. These are not included in this total. The final statement should further define and clarify these numbers.

3. On page III-75 it is stated that land commitment for injection wells is not confined to the area occupied by the well head and feeder pipeline (s). It is EPA's opinion that although the degree of contamination or the depths vary from those associated with seepage ponds, there is no difference in principal, i.e., contamination of the resource and denial to at least some uses for a period extending into the future. Therefore, we feel the final statement should address this concern.

4. Considering the low annual precipitation (8.5 inches) and abundance of ground water supply, the final statement should address an alternative waste management scheme of incorporating more evaporaton and less seepage/injection.

IV. REGULATORY GUIDELINES AND CRITICAL REVIEW

1. Although the draft statement (page II-222 to page II-228) clearly indicates that various groups have reviewed the waste management

policies at INEL, it was not made clear what recommendations were made by these groups and, more importantly, what response was made by ERDA management. For example, the National Academy of Sciences Committee on Geologic Aspects of Radioactive Waste Disposal (1966) was critical of many waste management practices (and underlying assumptions) at INEL. Among these were:

(a) Reliance on use of seepage pits in an area of low rainfall to immobilize wastes in the unsaturated zone.

(b) Corrosion of buried pipes and ordinary steel drums (containing transuranic wastes).

(c) Inadequate knowledge of the movement of fluids through the vadose zone and consequent movement of the radioisotopes; assurance of long-term safety is particulary troublesome.

(d) Major anxieties centering about : (i) the secondary role of long-range safety compared to economy of operation; and (ii) over-confidence in the capacity of the local environment to contain vast quantities of radionuclides for indefinite periods without danger to to the biosphere.

(e) Percolation of wastes through surficial sand and gravel to the water table.

(f) General concern that none of the major sites used for the storage and disposal of radioactive wastes is geologically suited except for very dilute, very low-level liquids.

(g) Allowing hazardous concentrations of radionuclides to appear in potable ground water (whether or not currently in use) which was considered as part of the biosphere.

(h) Deliberate introduction of wastes into fresh-water aquifers.

(i) Ion exchange equilibria are reversible and under changing conditions desorption could result from man's activities or climatic changes.

(j) Inapplicability of the concept of "delay and decay" to long-lived isotopes such as Sr-90 and Cs-137; concentration of radioactivity in soil and rock materials used for the disposal of low level wastes may approach that of intermediate or high level wastes, in effect becoming a policy of "concentrate and contain".

(k) Lack of knowledge of the base of the fresh-water system in the Snake River Plain; recommended that a deep exploratory well be drilled.

The final statement should acknowledge the recommendations made by the various study groups and the actions taken to respond to them.

2. The waste disposal practices at INEL as indicated in the draft statement, are such that the waste water discharges may be in violation of the intent of the EPA Proposed Regulations for State Underground Injection Control Programs published in the Federal Register on August 31, 1976. The Safe Drinking Water Act (PL 93-523), provides EPA with authority that may affect the ERDA operations at the INEL. Part C, requires EPA to develop regulations for State programs to control underground injection of wastes by well injection. The States, in turn, are charged with developing an acceptable control program. These requlations will apply to injection wells at Federal Facilities unless they are waived by the EPA Administrator upon the request of the Secretary of Defense and upon a determination by the President that the requested waiver is necessary in the interest of national security (SDWA 1447 (b)). This legislation will influence Federal Agencies to modify considerly their injection well practices as regards to the dilution of chemical wastes in cooling water and their subsequent injection into an aquifer. The approach that an aquifer can be degraded until drinking water standards are exceeded before contamination occurs is contrary to the precepts of the Safe Drinking Water Act. The final statement should include a discussion on these regulations and how they will be handled by INEL.

3. In EPA's opinion, the practice of waste disposal via ponds and wells in areas upgradient from supply wells is contradictory to the as-low-as-reasonably-achievable (ALARA) concept despite the fact that water quality meets drinking water guidelines for radioactivity. The final statement should address this concern.

4. On page IV-2, the tritium concentrations in the nearest down-gradient production well (CFA) is calculated to result in an annual radiological dose commitment to onsite personnel of 4.0 millirem. If future circumstances of population growth or use of the Snake River Plain aquifer require use of this production well as a community water supply system; then EPA drinking water regulations concerning radionuclide maximum contaminant levels could be exceeded. The regulations published in July 1976 propose limits effective June 24, 1977 on the dose from manmade sources at four millirem per year

for organs of the body or the total body of individuals served by the water supply. The INEL well waters at CFA are now at the maximum containment level and future discharges of tritium should be reduced as low as reasonably achievable to permit decay from the fully contaminated state. Therefore, the final statement should discuss the radiological doses received due to tritium in drinking water and should compare this annual dose commitment of four millirem with the dose standard in the Interim Primary Drinking Water Regulations promulgated by EPA under the Safe Drinking Water Act. Alternate well water sources at different locations on the site may be available and their use should be discussed in the final statement

5. The document makes reference to specific standards, ERDA Manual Chapter 0511 and 0524, that regulate radioactive waste disposal at ERDA installations. Since many of the nuclear reactor facilities under test at the Idaho are related to the development or testing of technology for electric power production, the comparison of Appendix I in 10 CFR 50 and the proposed standards of EPA concerned with long-lived radionuclides of the uranium fuel cycle (40 FR 23420) should be discussed in the final statement, in relation to the continued operation of the Idaho Site and the subsequent population dose levels.

V. ADDITONAL COMMENTS

1. A number of alternatives are considered relative to current waste management practice and operations at INEL. In our opinion, this chapter does not present the various alternatives in a uniform manner to determine which alternatives are most realistic or feasible in comparison to the others. The costs of the suggested alternatives are not uniformly presented--nor are any potential benefits identified other than a statement on page V-3 that that general alternative of shutting down all waste systems would guarantee zero emission. The final statement should discuss each of the disposal or discharge facilities described in Chapter II and evaluate them in comparison with the alternative recommended by INEL.

2. The draft statement indicates that shutting down all waste systems would guarantee zero emission (page V-3). We feel this is misleading. Perhaps emissions from operating facilities would be eliminated, but the potential for release of radioactive materials to the environment would still exist from previously-generated wastes. This should be mentioned in the final statement.

3. In Section V-A.2.b., the alternative of terminating waste-handling operations and providing surveillance of existing stored and previously-disposed waste is considered. The statement is made that this alternative would require the continued sampling, monitoring, and surveillance of waste locations, which is estimated to cost approximately $200,000 annually. In EPA's opinion, this section does not completely address the true costs of the above alternative. The final statement should consider the additional initial costs for engineering and excavation associated with seepage and burial site closing, the problem of long-term care and maintenance associated with this alternative and the costs, care requirements, and duration of care and surveillance required.

4. In Section V-A.3, the alternative of transferring waste off-site is discussed but no cost estimate is provided for this alternative. The final statement should discuss this.

5. Section IX-2.c. discusses costs of solid radioactive waste disposal options. On page IX-14, cost estimates are given for encapsulation and engineered storage and combustion and engineered storage as $27/ft^3$ and $12/ft^3$ respectively, for routine solid radioactive wastes. These costs are compared to the current method of disposal at $1.10/ft^3$. The final statement should incidcate the time duration for which the estimates for the engineered storage options are made and the basis from which the cost estimates are determined. The cost estimates should be documented by reference to an engineered storage facility design, if possible. These estimates should include identifying future costs for long-term waste management options which then could be compared with present costs.

6. The final statement should include an estimate of projected land commitment. While the draft statement currently estimates that only about 2.0 acres are permanently committed, this can be expected to increase with time as future wastes are generated. Additional commitments may be required as major facilities are decommissioned.

7. The final statement should include the cost estimates for the waste handling processes, where possible, in planning future waste disposal site controls.

8. It is not clear how the predicted concentrations of nitrogen oxides, carbon monoxide, and particulates, listed in table III-XV, were determined, as the averaging times are not indicated. The final statement should contain a description of the methodologies and assumptions used in generating these figures and should indicate the time intervals used with each estimate.

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EXHIBIT 18

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER 76/639

NOV 4 1976

Dear Mr. Pennington:

Thank you for your letter of June 29, 1976, transmitting copies of the Energy Research and Development Administration's draft environmental statement for Waste Management Operations [ERDA-1536], Idaho National Engineering Laboratory (INEL), Butte, Bingham, Jefferson, and Clarke Counties, Idaho.

Our comments are presented according to the format of the statement or by subject.

General Comments

The draft statement lacks information concerning environmental hazards of the components of the radioactive wastes. To adequately characterize environmental effects, we recommend the final statement include a full discussion of the toxicity of released radionuclides, outside of specific dose calculations for specific human exposures. The latter are not sufficient to describe ecological effects of each species of released radionuclides. For example, on p. III-61 of the draft statement it is stated that iodine-129 is estimated to have been released at an average rate of 0.1 Ci per year. Compared to the millions of curies of other gases released each year, this quantity might seem small; however, iodine-129 is extremely active biologically and has a half-life of 17 million years. Similarly, there is no mention of the characteristics that would make plutonium and other long-lived transuranic components of the waste an unprecedented environmental hazard.

The narrative describing impact of the proposed action is directed mostly to impact on man rather than impact on the total environment. We believe the indirect effect on man resulting from changes in the natural environment should also be considered in the final statement.

We would also suggest that the glossary in the final statement list definitions for rad and rem.

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Geology and Soils

Throughout the draft statement, geologic conditions are discussed in highly generalized terms that are not adequate for an evaluation of the environmental impact of the waste management operations. For example, the geologic information shown in figures II-34, II-37, II-60, and II-68 in the draft statement makes reference to "sediments" or to "surficial deposits," but little information is provided on the character or thickness of these unconsolidated materials. We recommend that the final statement should provide a complete description of subsurface material beneath the seepage ponds and solid waste burial grounds, since the long-term containment of the radioactive waste is dependent upon the properties of the underlying material. For example, the draft statement indicates on page II-285 that "the fraction of the soil less than 2mm in size has the capacity to sorb radioactive ions," but the prevalence of this size fraction in soils beneath the disposal sites is not discussed. We recommend that the final statement provide a more comprehensive analysis and evaluation of the probable magnitude of ion-exchange and sorption on the basis of sediment distribution. This evaluation should consider the significance of the smaller proportion of sediments found within the basalt section in some parts of the INEL such as the southeast and south central areas as compared to the areas of Big Lost River and the playas. We believe that the information in the final statement should be sufficient to determine whether or not nuclear contaminants will eventually move beyond the boundaries of the INEL. We recommend that the final statement should provide more adequate information on the justification for storing these wastes above such a large aquifer which is vital to grazing, irrigation, municipal and industrial use in southern Idaho.

Hydrology

We recommend that the final statement should consider the probable beneficial and adverse impacts of very rapid infiltration during periods of high stream discharge in evaluating both solid waste disposal and storage, and dilution of wastes already in the groundwater reservoir.

We find that the draft statement does not adequately discuss the possibility of flooding of the waste burial grounds at INEL. We believe that the location of the waste burial grounds should be shown on a detailed map in the final statement in relation to the local drainage and/or the Big Lost River flood plain. A recent report by the U.S. Geological Survey shows the burial ground to be in a depression surrounded on three sides by low hills.1/ This suggests that the flooding from local precipitation and rapid snowmelt, noted in the draft statement for 1962 and 1969, could be a persistent problem. The burial ground is located on the flood plain of the Big Lost River, about two miles from its present channel, but about 40 feet below the channel elevation. The above cited report mentions evidence suggesting that within the recent geologic past, floods of the Big Lost River flowed through the basin in which the burial grounds are located. We recommend that this information be included in the final statement, in a full evaluation of the long-term flood potential of the burial ground. Other facilities, in particular the ICPP, also appear to be located on the flood plain. An evaluation of the potential of flooding this and other potentially affected facilities should also be included in the final statement.

We believe that there is inadequate documentation for the assumption on page II-124 that "Climatology and hydrology of the area preclude major flooding of the facility site in the current geologic era." A Geological Survey report is cited on page II-294 in the draft statement as a "detailed analysis . . . on the probability and potential effects of rare and catastrophic floods on the Big Lost River in relationship to the INEL." However, we understand that the report was limited to a determination of the probability of snowmelt floods on the Big Lost River exceeding the capacity of the INEL diversion dam, the associated diversion channel, and the spreading ground dikes. The report concluded that

1/ Barraclough, J.T., Robertson, J.B., and Jancer, V.G., 1976, "Hydrology of the solid waste burial ground, related to the potential migration of radionuclides," Idaho National Laboratory, with a section on drilling and sample analyses by Saindon, L.G.: U.S. Geol. Survey Open-File Report 76-471, 199 p.

the system existing in 1971 would be overtopped by snowmelt floods of magnitudes exceeding a 55-year frequency, and that by doubling the diversion channel capacity, floods of a magnitude corresponding to a 300-year frequency could be contained. Contrary to the draft statement, the report by the Geological Survey did not investigate rare and catastrophic floods, such as a probable maximum flood based on the most extreme meteorologic and hydrologic conditions to be expected in this region or failure of Mackay Dam. The report states that failure of Mackay Dam may be hypothesized for floods of a recurrence interval not much greater than 300 years; that results have not been investigated; and that this factor should be considered in plans for improving the INEL flood-control system. 2/

It should also be emphasized that this report did not investigate effects of floods on any INEL facilities other than the diversion dam, diversion channel, and spreading ground dikes.

We strongly recommend that the section in the final statement concerning hydrologic impact should more accurately reflect the analyses of flood potential contained in the Geological Survey Report cited. We also recommend that the final statement investigate rare and catastrophic floods and consider plans for improvement of the INEL flood control system.

Since the long-term flood potential of the present solid waste disposal site is not fully described in the draft statement, an adequate comparison of alternative locations for the burial ground and the transuranic storage area cannot be made. We recommend that the final statement include these considerations to facilitate a complete evaluation of the proposed solid waste disposal site and its alternatives. In addition, we believe that the final statement should consider relocation of the burial area to higher altitudes not subject to flooding.

2/ Carrigan, P.H. Jr., 1972, "Probability of exceeding capacity of flood-control system at the National Reactor Testing Station," Idaho: U.S. Geol. Survey Open-File Report, 18 p.

Results from a mathematical model showing strontium and cesium attentuated to insignificant levels 100 and 300 years after migration from the burial grounds are discussed on pages III-105 to III-106 and are attributed to an excerpted report that was to be published by the Geological Survey after the draft statement. This report has now been published, but we believe it does not contain the results attributed to it in the draft statement.3/ These results were from an earlier draft and were based on a set of assumptions and simple arithmetic calculations, not mathematical models. In fact, we understand that these results were considered to be so highly speculative because of the lack of documentation for the assumptions, that the results were not published in the Geological Survey's final report. Also on page III-107, the draft statement concluded from the unpublished version of the report that it seems likely that samples showing radionuclides to have migrated below the burial grounds were, in actuality, contaminated by surface sources. We believe this implies that the downward migration of radionuclides was not shown by the Geological Survey's report and thus, differs from the conclusion reached in it. Inadvertent contamination of samples was a distinct possibility considered in great detail. However, in the published report the authors "infer that some radionuclide constituents of the waste have migrated from the burial pits and trenches to the 100-foot (34-m) and the 240-foot (73-m) sediment layers."4/ We strongly recommend that this section of the final statement should be reconciled with the data and analysis actually published in the finalized version of the Geological Survey report.

Archaeological and Cultural Resources

We believe that the discussion of archaeological resources in the draft statement in insufficient for compliance with the National Historic Preservation Act of 1966 and Executive Order 11593 "Protection and Enhancement of the Cultural Environment." We recommend that the final statement should include a more extensive discussion of the cultural resources of the project area including a description of the sites, analyses of impacts upon them, and specific mitigation measures proposed.

3/ Op cit., Barraclough.

4/ Ibid. p. 85

On page II-258 of the draft statement it is stated that the Experimental Breeder Reactor I is listed on the "National Register of Historic Places." Since this site is on the National Register, we believe that it is necessary to assess the impacts of the proposed action upon the site in consultation with the State Historic Preservation Officer and through application of the Criteria of Effect under 36 CFR 800.

Solid Radioactive Wastes

The total quantity of radioactivity in solid wastes disposed of at the burial grounds from 1952 to 1974 is presented in the draft statement on page II-226 as approximately 6 million curies. However, Table II-LIII identified radionuclide species for only those solid wastes buried in 1974. Since the total radioactivity in the solid wastes was very small in 1974 as compared to other years (Ref. Table II-LV), and there was no indication that the 1974 waste composition was typical, the radionuclide species contained in the 6 million curies of waste remain unknown. Because presumably both short- and long-lived species are included, the total curies of waste does not adequately describe the wastes.

The same lack of information applies to the discussion of ANLW high-level wastes in the draft statement on page II-233. However, on page III-107 the draft statement indicates that the activity of more than $9(10)^6$ curies in the wastes would be reduced to insignificant levels within 100 years. One constituent of these wastes, plutonium-239 with a half-life of 26,000 years, could not be significantly reduced in 100 years. We believe that without knowing the quantity of plutonium-239 and all other long-lived radionuclides in the over $9(10)^6$ curies of ANLW wastes, the statement concerning their decay to insignificance within 100 years cannot be substantiated (see p. III-107). We recommend that the final statement identify the composition and half-lives of the radionuclides in both solid wastes and the ANLW high-level wastes in a single table so that the impacts caused by long-term decay products can be readily assessed.

Impact on Biota

The accumulation of iodine-129 measured in antelope thyroids appears to be surprisingly high relative to the estimated release of 0.1 Ci per year. In the absence of any discussion of its mechanism of uptake and in view of the 17-million-year half-life of iodine-129, we assume that there is a cumulative effect in wildlife and that the thyroid concentrations will continue to rise. As the recorded concentrations already approach levels that would be considered on the order of the maximum permissible burden for human thyroids, it is likely that eventually these levels could become significant also for antelope. We recommend that this issue be fully considered in the final statement.

Also, the section on alternatives indicates that iodine release could essentially be eliminated at a cost of $400,000, but it is not indicated in the draft statement whether or not this alternative is being actively considered. We recommend that the final statement should supply a serious consideration of this alternative in view of the measured levels of iodine-129 found in antelope thyroids.

It is desirable that the impact of the proposed action on the natural environment should be clearly discussed in the final statement. Since the INEL has been designated a national environmental research park to study environmental changes caused by man's activities, and develop information to assist in land use decisions, we suggest that additional ecological information be included in the final statement. The seral or climax status of the natural plant communities represented in the project area should be identified, along with present trends. It would be helpful if the home range of major animal species represented on the site, including antelope and sagegrouse were mapped and their seasonal movement patterns identified. Likewise, the status of representative species lower on the food chain should be considered as part of the baseline information needed to interpret the status of the natural communities present. We understand that ecological studies are in progress, but we recommend that analyses completed to date should be incorporated into the final statement. Heavy grazing by domestic livestock could seriously alter and adversely affect the natural plant and animal communities present in the area, thus masking any

impact from radiation and grossly reducing their value for research purposes. For example, certain plant species may be less tolerant to radiation exposure than others. Some species may also be less tolerant of grazing pressure, creating difficulties in data interpretation. We suggest that the elimination of grazing be considered to ensure that the environmental research project results are as accurate as possible.

The discussion of the impact on the biota is divided into segments by type of specific action involved. Since it is the sum of the total action that will impact the environment, we believe that these impacts could be more effectively discussed in their overall context. The discussion in the draft statement entitled "Environmental Dose Commitment" relates specifically to man, rather than the overall environment. Consequently, it seems that in addition to viewing total effects of proposed action, there is a need to consider the impact of all radiation persisting over an extended time from all sources in the project area. We believe the impacts of radiation from the INEL project should be considered in addition to present and future radiation that would impact the overall environment from other sources.

Impact on Humans

We recommend that the impacts section in the final statement be expanded to include a worst case analysis of the effects of a human thyroid dose of about 21 mrem from iodine-129 consumed in meat from animals grazing at the highest point of radiation exposure (see p. III-62 in the draft statement).

A good description of the impact of discharge of contaminated liquids into the lithosphere is presented in the draft statement on p. III-80 to 93. However, the final statement could be improved by adding a description of the impact to a person eating several waterfowl containing the highest probable radionuclide concentrations.

Accidental Releases

Section II.C.10 and Appendix B omit any discussion of the current accidental releases from the TRA retention basin mentioned on page II-194 in the draft statement. Apparently the loss for the past several years has amounted to more than 10 percent of 15 to 20 million gallons per month. We recommend that the final statement indicate how great the increase in impact may be, as compared to that resulting from bypassing the retention pond and routing all low-level wastes directly to the seepage pond. We suggest the final statement also should clarify whether such a bypass would be considered as a permanent practice.

Alternative Sites

The possible alternative of transferring wastes away from the INEL site is rejected on p. I-15 in the draft statement because "This alternative would require the same commitment of lands and waste handling facilities at another location with the added risk and costs associated with transporting waste from the INEL to the alternate location." We believe that this disregards the present local potential hazards to water in the Snake Plain aquifer underlying the INEL and water in the rest of the Snake Plain. The final statement should fully discuss this potentially significant adverse impact on the Snake Plain aquifer, including adverse secondary effects to the economy and environment of that area. Further, we are not aware of a method to "decontaminate" the regional aquifer once it has been contaminated.

Unavoidable Adverse Effects

This section in the draft statement relates that the adverse environmental effects of routine operations are primarily due to the atmospheric release from the various facilities. The draft statement indicates that the calculated exposure to a person at the INEL boundary is 1.5 mrem compared with 150 mrem from existing natural background radiation. However, this section does not delineate specifically what cumulative impacts may result from the total of all atmospheric releases added to the natural background. We suggest that ERDA's best judgment of the specific impacts of the waste management operations on the human environment should be discussed in

the final statement and only those impacts that appear to be in the category of significant adverse effects should be included in this section of the final statement.

Specific Comments

Pages I-9 and II-3. Sagegrouse are residents on the INEL and often move long distances from winter to summer habitat, particularly in the project region. As a result, we believe that their entire range should be identified and discussed in the final statement. In addition, we recommend that an estimation of the number of discreet populations involved should be supplied in the final statement.

Page II-313. The draft statement relates that raptors are indigenous to the area and that some migrant species, including hawks and golden and bald eagles pass through the area. We believe that it is likely that very few raptors could be considered indigenous. The text also indicates that golden and bald eagles and the prairie falcon are endangered species. We suggest this statement be corrected in the final statement, since only the Southern bald eagle, ranging south of the 40th parallel is currently officially listed as endangered by the Department of the Interior.

Page III-111. We suggest that the term "insult to the environment" should be specifically defined in the final statement.

We hope these comments will be useful to you.

Sincerely yours,

Stanley R. Doremus

Deputy Assistant Secretary of the Interior

Mr. W. H. Pennington
Director, Office of NEPA Coordinator
Energy Research and Development
Administration
Washington, D. C. 20545

EXHIBIT 18-A

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER 76/639

FEB 4 1977

Dear Mr. Pennington:

New information has recently come to our attention relative to our review of the Energy Research and Development Administration's draft environmental statement for Waste Management Operations (ERDA-1536], Idaho National Engineering Laboratory (INEL), Butte, Bingham, Jefferson, and Clarke Counties, Idaho. The following comments are submitted as a supplement to our comment letter of November 4, 1976.

The Radioactive Waste Management Complex (RWMC) is located in a volcanic-tectonic zone that has experienced volcanic eruptions as recently as about 10,000 years ago and earthquakes probably within the last 40,000 years. We believe that these factors pose geologic hazards to the RWMC and other INEL facilities.

Although it is impossible for us to assess accurately the probabilities for volcanic and earthquake hazards with the data now available, we feel that volcanic eruptions and earthquakes may be expected within the next several tens of thousands of years. These rough estimates of the recurrence intervals for these geologic hazards suggest that INEL is not suitable for the permanent storage of radioactive wastes. Our main concern is that the probability of geologic hazards affecting even the temporary waste storage facilities at INEL is inadequately assessed in the draft statement.

The following factors, having important consequences to the evaluation of hazards, are treated inadequately or not mentioned in the statement: 1) the mode of eruption of basalt (rift controlled eruptions); 2) structures of the basalt flows; 3) physical properties of flowing basalt lava (e.g., viscosity, temperature); 4) the areal extent of flows from individual volcanic vents; 5) the ages of basalt flows within the INEL site; 6) the age and significance of rhyolite lava flows and welded tuffs on the margins of the Snake River Plain

near INEL; and 7) the age and significance of two rhyolite domes (East Butte and Big Southern Butte) either on or within three miles of the INEL site.

Conclusions reached in the draft statement are: 1) volcanism can be expected to occur on the Snake River Plain, but no fissures or rifts would be expected in the RWMC; 2) a more likely event would be a lava flow that would cover all or part of the RWMC; and 3) a lava flow could well result in a surface seal to the RWMC contents and would result in an improved condition.

Our field investigations in the RWMC and adjacent areas show that a graben-rift zone (Arco zone) extends from Arco, Idaho, southeastward about 35 miles to about 8 miles southeast of Big Southern Butte. The distribution of volcanic vents associated with the Arco zone suggests that it may be as wide as 15 miles. The RWMC lies within the Arco zone, on its northeast margin. Preliminary ^{14}C (radiocarbon) ages on organic matter from beneath lavas from two rift-controlled vents in the Arco zone are as follows:

Cerro Grande lava field	10,500 ^{14}C yr
North Robbers lava field	12,000 ^{14}C yr

Vents for these flows are approximately 13 and 9 miles from the RWMC respectively. We cannot give probabilities for the likelihood of future development of rifts or volcanic vents in the Arco zone or, more specifically in the RWMC, on the basis of data available at present, but our studies and the preliminary age data suggest that the Arco zone has been the locus of considerable structural deformation and eruptive activity from several hundred thousand years ago up to the recent past. Thus, it appears that volcanic hazards do indeed pose a threat to RWMC.

The RWMC is underlain by two lava flows which were erupted from separate sources, both of which are rift-controlled vents in the Arco zone. The older flow (estimated age 200,000 ± 100,000 yr) is from a vent located about 3 miles south of the

RWMC. This flow covered the southern half of the RWMC and flowed at least 12 miles to and beyond the Central Facilities Area of INEL. The younger flow (estimated age 40,000 + 20,000 yr), covering the northern half of the RWMC, emanated from Quaking Aspen Butte, located about 12 miles southwest of the RWMC. The location of these two vents and the extent of their flows suggest that the RWMC may be subject to inundation from future lava flows from both distant and nearby source vents. This problem is compounded by the fact that RWMC lies in a topographic depression into which lava flows, originating to the south, west, and northwest, are likely to be channeled.

Our studies suggest that a small but significant number of basalt eruptions in and near INEL in the past have been of the phreatomagmatic variety. These are moderately violent eruptions which occur when basalt magma comes in contact with large volumes of groundwater such as that which exists in the Snake River Plain aquifer. This type of explosive eruption, along with the more normal fissure and shield eruptions, should they occur in or very near the RWMC, would indeed pose a serious threat to the security of the radioactive wastes stored on pads on the ground surface as well as buried wastes. Rupture of containers and dispersal of radioactive contents are real dangers from eruptions within or near the RWMC.

The great fluidity, large volume, and high lava temperatures of basalt eruptions, similar to those that have occurred in the past on the Snake River Plain, also pose threats to stored radioactive wastes. Rapidly moving fluid basalt lavas could be funneled into the RWMC, disrupt or destroy uncovered containers, and disperse and, possibly, burn or volatilize their contents. Such a process would surely pose a serious threat to the RWMC and would likely not result in an improved condition, as mentioned in the statement.

Studies by USGS geologists in the Yellowstone-Island Park and eastern Snake River Plain areas have shown that explosive rhyolitic eruptions have occurred within and on the margins of the Snake River Plain at least several times within the last few million years. Such eruptions in the future would

pose a significant volcanic hazard to RWMC and all of INEL in the form of ash flow deposits and/or air-fall ash deposits. While the likelihood of such an eruption occurring in or near INEL in the immediate future is very small, this factor cannot be overlooked. There is no mention of this type of eruption or its consequences in the statement.

Our studies suggest that the rocks of East Butte and Big Southern Butte were emplaced by the slow rise of viscous rhyolite magma to form domes. Ages for these two features are about 1 million and 300,000 years respectively. Geological evidence suggests that these two eruptions were quite passive, rather than violent, but the fact that any rhyolite eruption can be potentially violent should not be overlocked. Big Southern Butte is located in the center of the Arco zone, suggesting that the zone's structural weaknesses provided crustal access to rhyolitic as well as basalt magmas. This factor adds another dimension to the potential volcanic hazard for the RWMC and INEL.

In the draft statement, earthquake hazards were also treated inadequately. Lava flows in the Arco zone, which we estimate to be approximately 40,000 years old, are cut by faults with as much as eight meters of displacement.

The area of faulting lies approximately eight miles northwest of the RWMC. There can be little doubt that this faulting was accompanied by earthquakes. This suggests that the RWMC and some reactor facilities at INEL may be subject to earthquakes from sources closer to the RWMC than has heretofore been recognized. This factor is in contradiction to the comment in the statement that "faulting or earthquakes would not be expected in the Plain itself" (p. III-135). The integrity of unburied waste containers would be seriously jeopardized as a result of local earthquakes. The possibility of an earthquake originating on the plain also poses questions about the integrity of reactor facilities sited elsewhere at INEL. Furthermore, the effects of ground motion at RWMC from earthquakes originating off the plain are dismissed as

inconsequential in the statement: "The safety of materials at the RWMC would not be expected to be threatened" (p. III-135). However, no data are presented to support that conclusion.

We hope that these comments will be useful to you.

Sincerely yours,

Stanley D. Doremus

Deputy Assistant Secretary of the Interior

Mr. W. H. Pennington
Director, Office of NEPA Coordinator
Energy Research and Development
Administration
Washington, D. C. 20545

EXHIBIT 19

Oct 5 1976
Box 192
Nevada Mo
93434

Dear Sir,

Being a busy mother, I had just finished this time to read the entire Draft Environmental Statement by the Oct. 9 deadline.

But I sincerely believe the utmost caution should be used concerning nuclear energy. Your Title is Energy Research and Development Administration. Research must precede Development. Extensive Research!

I am especially concerned with the possibility of genetic defects caused by radiation.

After effective measures to deal with atomic waste are found, nuclear energy could be explored.

But as a mother I believe the misuse of this stupendous force in the manufacture and testing and eventual usage of atomic weapons is shamefully despicable.

Will we create a generation of genetically deformed children? Are you too selfish to even care if they will have a future?

This may well be mankind's own suicide.

Mrs. Susan (Carter)

12505

X-184

EXHIBIT 19 (Continued)

P.S.

I know the sorrow and seriousness of genetic defects. My firstborn child had a chromosonal abnormality. Could she possibly be one of the early victims of mans' destructive power?
She died at 11 mos. of age.
Will future children be exposed to excessive radiation and die also?

EXHIBIT 20

eng inc
Energy Research Group, Inc.

November 12, 1976

W.H. Pennington, Director
Office of NEPA Coordination
U.S. ERDA, E-201
Washington, D.C. 20545

Subject: Comments on ERDA-1536

Dear Mr. Pennington:

This letter transmits comments on the Draft Environmental Impact Statement on Waste Management Operations at the Idaho National Engineering Laboratory, ERDA-1536. We are providing these comments as a result of our concern about federal programs for the management of nuclear wastes.

Our review of the DEIS on Waste Management Operations at INEL has led to the conclusion that the standards and criteria that apply to the performance of nuclear waste handling and treatment programs, and to the assessment of program impacts and alternatives, for federal government wastes appear to be different than those applied to the commercial applications of nuclear materials, particularly commercial nuclear power. The document seems to indicate the acceptability of waste effluents and waste handling and storage operations that are in question as applied to commercial facilities. The scope of analysis, and the assessment of future activities and reasonable alternatives, is insufficient to reach conclusions on the acceptability of the current Waste Management Operations program.

We understand and concur that the scope of the DEIS is not intended to include justification for programs generating nuclear waste, nor to evaluate ultimate waste management/ disposal programs; however, there is remaining uncertainty as to the scope and purpose of the DEIS. The DEIS should specifically state the scope of the agency program that is subject to this review, the program assessment that the DEIS is intended to accomplish, and the conclusions of the assessment; that is, whether current program operations are adequate or should be revised.

A NEPA Environmental Statement should provide a comprehensive review of the environmental impacts to be anticipated from a federal program or action, with an evaluation of all reasonable alternatives that would affect the environmental impact of the program as proposed. The current statement reviews the historic performance of waste management operations at INEL; it does not assess the current and future program with an evaluation of reasonable alternatives. The DEIS seems to be an "environmental survey" or a baseline document for a program assessment, but it does not seem to be sufficient as a NEPA EIS on the current INEL Waste Management Operations program.

Our principal comments with respect to the DEIS are:

1) There is insufficient definition of INEL waste management program status and commitments, including committed and projected low-level waste disposal, fuel reprocessing and high-level waste generation and solidification;

2) There is insufficient evaluation alternatives to current and projected program operations; and

3) There is insufficient definition of standards and criteria for waste characterization, waste handling, and implementation of system improvements.

The report does not provide sufficient data and projected program requirements to evaluate environmental costs and to evaluate alternative systems or programs which could mitigate future impacts. This information must be known by INEL personnel with a considerable degree of certainty well into the future. Such information should include current on-site spent fuel inventory and processing schedules, and anticipated spent fuel generation and acquisition.

The DEIS should identify the sources of waste to INEL. For wastes generated off-site, the source of waste to INEL WMO includes external actions such as the transportation of wastes and spent fuels to the site. Since wastes are generated all over the world, the analysis should include transportation costs and risks, and the reasonable alternative of providing waste disposal, reprocessing, and treatment (the NWCF) where the wastes are generated. Consideration should also be made of the fact that recovered uranium is transported back to Oak Ridge or Portsmouth. Projections of waste and spent fuel transportation, and the shipment of recovered products, should be included.

The alternatives that are presented are generally trivial and are discussed without analysis, evaluation, conclusions or recommendations. Reasonable alternatives should be realistically assessed, rather that the presentation of unrealistic alternatives refuted by superficial arguments. Among the reasonable alternatives that should be evaluated are: suspension of waste operations pending establishment of uniform standards for military, research and commercial waste programs; meeting NRC regulatory standards; ceasing all discharge to seepage basins, with and without recovery of radioactivity in soil columns; and ceasing the calcination of wastes pending development of a vitrification process, or replacing the NWCF with a developmental vitrification facility, including an evaluation of the advantages of a vitrified product over a calcined product.

Radioactive waste and effluent treatment systems, flowsheets and component descriptions, and the evaluation of alternative designs should be presented. System flow data on waste and effluent streams as to volumes, waste characteristics, activity levels and radionuclide content should be included.

Differences in fuel reprocessing, storage, handling and release criteria should be explicitly identified. The position of the federal government on reprocessing of spent nuclear fuels should be addressed in the light of ICPP operations. If the federal government recommends against commercial reprocessing "at the present time pending resolution of the issues", the rationale for continued operation of ICPP and the construction of the NWCF should be presented.

There is no reasonably quantitative assessment of accident risks. No data on inventories and release potential for severe abnormal conditions are presented. Particular attention should be given to the ICPP, the TSA, and the NRF Expended Core Facility.

We are of the belief that the potential hazards and environmental impacts of nuclear wastes, subject to a reasonable and responsible waste management program, are well within the category of acceptable risks to public health and safety and to the environment. We are concerned that the present document does not adequately describe the wastes and the waste handling process in the INEL Waste Management Operations program. Explicit descriptions of waste sources, waste characterization, waste treatment and impact assessment, including a more comprehensive analysis of alternatives, and identification of program and systems modifications, where justified, will meet the intent of NEPA and demonstrate the minimal impact and acceptable risks associated with the generation and handling of nuclear wastes.

EXHIBIT 20 (Continued)

Thank you for the opportunity to review ERDA-1536 and to provide these comments. We hope they will be of assistance to you. If we can elaborate on any of the comments, we will welcome the opportunity. We will appreciate the receipt of any further materials related to the INEL Waste Management Operations environmental impact assessment.

Sincerely,

Ian A. Forbes, Ph.D.
Technical Director

James B. Muckerheide
Staff Engineer

EXHIBIT 21

UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
WASHINGTON, D.C. 20545

March 9, 1977

Robert W. Fri
Acting Administrator
Energy Research and Development
Administration
Washington, D. C. 20545

Dear Mr. Fri:

Consistent with the notice of hearing issued on January 3, 1977 (42 F.R. 67) public hearings were held on the ERDA Draft Environmental Statement "Waste Management Operations, Idaho National Engineering Laboratory, Idaho" (ERDA-1536) in Idaho Falls, Idaho on February 1, 1977 and in Boise, Idaho on February 3, 1977. The hearings were conducted by the undersigned Presiding Board in conformance with the procedures set forth in the notice.

Following review of the draft environmental statement and of the record compiled to date (including the written comments submitted after the close of the hearings but before the close of the record), the Board has identified a number of issues which may be critical to future decision making. A report setting forth these issues, as well as the Board's recommendations concerning their treatment in the final environmental statement, is submitted herewith. In addition, the record of the hearings, consisting of the transcripts, written statements, documents, and exhibits submitted by private persons, organizations and Government agencies, is transmitted for your information.

In accordance with the duties assigned, the Presiding Board has not undertaken to resolve the issues raised or to render judgments concerning any such issues. However, the Board trusts that its report and identification of issues will assist you in further decisions to be made regarding the waste management program at INEL.

Respectfully,

THE PRESIDING BOARD

G. Victor Beard
Member

Herbert M. Parker
Member

John B. Farmakides
Chairman

Enclosures:
As stated

THE PRESIDING BOARD'S STATEMENT
IDENTIFYING VIEWS AND ISSUES ON
THE DRAFT ENVIRONMENTAL STATEMENT
"WASTE MANAGEMENT OPERATIONS, IDAHO
NATIONAL ENGINEERING LABORATORY, IDAHO"
ERDA-1536

I. INTRODUCTION

As provided by the Federal Register notice of January 3, 1977, 42 Fed. Reg. 66, the public hearings announced for the Waste Management Operations, Idaho National Engineering Laboratory, were held on February 1, 1977, at Idaho Falls, Idaho and on February 3, 1977, at Boise, Idaho. The hearings were conducted by the Presiding Board established for this proceeding in accordance with the rules of procedure set forth in the notice.

The Board has reviewed the draft environmental statement and the hearing record, has considered all the comments made, and has prepared a report in accordance with its mandate. While the report does not identify every issue raised, it does, however, isolate those issues which the board considered to be important or critical and presents its recommendation with respect to such issues in a manner which will promote informed decision making. In identifying these issues, the Presiding Board does not presume to judge their merits and does not undertake to render judgment concerning the course of the program.

The record of these public hearings, including copies of the transcripts, oral and written comments submitted to the board by members of the public, organizations and Government agencies, and the written responses of the staff to questions raised by such comments, are submitted herewith.

II. UNRESOLVED ISSUES

General. The majority of the written and oral comments received expressed general support for the reasonableness of the waste management practices at INEL. On the other hand, the draft environmental statement evaluating the program was criticized as lacking clarity in both usage and definition of many terms, having poor structural organization as well as poorly constructed sentences and paragraphs, and containing numerous errors. Generally, the criticism could be organized into two categories; items dealing with the organization and perspective of the statement, and those dealing with errors and omissions.

Organization. For a complex site such as INEL, preparation of a balanced presentation of the environmental issues with adequate attention to the stated concerns of non-technical persons is most difficult. For that very reason, such preparation deserves a degree of attention far beyond that which is currently evident. While there is no established model, it appears to the Board that the Hanford site is

about equally complex, and that its problems have been presented effectively in the parallel document, ERDA-1538. How the issues are addressed in the corresponding Savannah River report, ERDA-1537, may also be of help in considering any reorganization and revision of the final environmental statement. In addition, the draft statement does not appear to state its reference points as to what health and environmental guides are being used; only occasional references to ERDA Manual Chapters, and the recommendations of NCRP and ICRP, appear.

Errors and Omissions. As the comments repeatedly pointed out, the present report is replete with errors and omissions. Some of the errors are clearly typographical (as in the quotation of background dose rate in mrem/hr instead of mrem/yr); others are probably a matter of estimates by several sectional authors not having been reconciled by the editor (as in the oscillation of the average elevation of the desert plain from 4900 ft. to 4800 ft., and then to 5000 ft.); a few others are technical misstatements (as in the assertion of non-leachability from ion exchange media).

Whether these are factual errors of substance or not, the cumulative effect of numerous lesser errors equally serves to undermine confidence in the report.

The omissions most frequently noted were failure to mention small releases of long-lived radioactive constituents to the atmosphere or to the ground. In some of these cases, perhaps the omissions were a result of the reporter's knowledge that the omitted nuclides contribute a negligible fraction to the relevant total hazard. Unfortunately, the concerned public does not have that information; it reasonably concludes that the omissions are contrived to improve the image of waste management. This type of misunderstanding should be corrected. To the extent possible, full disclosure of all long-lived emissions, no matter how small, is desirable.

The comment letters of several major federal agencies contain many observations on technical points and provide an additional valuable resource to ERDA in strengthening the final environmental statement.

Unresolved Specific Issues.

A. A principal area of comment and concern was omission of reference to commitments made to then Governor Cecil D. Andrus by AEC Chairman, Dr. Glenn T. Seaborg, and the later Chairman, Dr. Dixie Lee Ray. These commitments concern the removal "of all radioactive wastes, both those buried under ground and those stored above ground, from above the Snake River Aquifer, starting at the end of this decade." (From

Comment Letter #15, Governor C. D. Andrus). The opening staff statement at the hearings recognized this omission and indicated an intent to correct it. The final statement should describe these understandings in unequivocal terms.

B. A number of Government agencies and private persons expressed serious concern with what may happen to the vital Snake River Aquifer resulting from "importation" of military waste sources, both the transuranic wastes from Rocky Flats and the spent Naval reactor fuels processed at the ICPP. They called for the projection of the amounts of these wastes into the future. While such a projection by the staff of military needs is impracticable, perhaps the final statement could address this issue by providing reference to, and some degree of integration with, the two more detailed supportive documents to be issued in 1977, viz:

1. Alternative methods for the long-range management of calcined high-level wastes, and
2. Alternatives for the long-range management of the transuranium-contaminated wastes received at the INEL since 1954.

At the Boise hearing, the staff response to the concerns of the State of Idaho Department of Water Resources indicated that two other related documents are in preparation, viz:

3. Risks and consequences of failure of the Mackay Dam.

4. Reassessment of the seismic risk.

It was also noted that a geological-hydrological study covering USGS work at the site from 1952-1970 was formally issued in January 1977. This is the same actual data as in Reference 76 p. X-5 of the draft statement, but it is there described as being issued by the AEC, Idaho Falls. It seems, then, that a projection of the type the public requires cannot be completed at this time. In fact, there may be no point in time that would be wholly satisfactory. Therefore, the Board recommends that consideration be given to modification of the present statement so as to make it as responsible as possible to present public needs, and that a firm commitment be made to publish an updated statement, with appropriate public hearings, at intervals of about 10 years. The Board would visualize that process continuing until the public accepts that the health and welfare of the communities around the INEL are indeed protected from the predictable effects of the waste management operations.

C. The Snake River Aquifer was also the subject of a related concern involving the discharge of biological wastes from INEL operations. Apparently an adequate off-site sampling program is needed that will give assurances to the public that any migration of biological, as well as radioactive material will be detected and evaluated. The final

statement should discuss this subject, particularly with respect to well sample monitoring.

D. Finally, the Board generally agrees with the comments criticizing the cost benefit analyses as being either superficial or written in such a manner as to require too much knowledge from the reader. As noted and discussed at the hearings, the final statement should be revised to address this issue.

E. In addition to those issues discussed above, the Board identified certain technical points requiring attention, some of which were addressed at the hearings, usually with the staff undertaking to provide the required data in the final statement. These topics are presented in brief form as an Appendix to this report with citations to specific participants or comment letters used for brevity and ready reference.

III. CONCLUSION

Following careful review and evaluation of the oral and written comments directed to the draft environmental statement, the Board has concluded that this statement requires substantial revision and modification before it is issued as a final environmental statement. While the environmental practices with respect to waste management operations at

INEL appear fundamentally sound and give reasonable assurance that they will not adversely affect the public health or the environment, such practices and their impact are not adequately reflected in the draft environmental statement.

In addition, the final environmental statement should be structured and presented so as to serve the needs of both the scientist and technical person as well as the responsible public layman.

THE PRESIDING BOARD

G. Victor Beard
Member

Herbert M. Parker
Member

John B. Farmakides
Chairman

APPENDIX to
Statement of Presiding Board
Draft Environmental Statement
ERDA-1536

Unresolved Technical Issues

1. Geology and Hydrology

Refer to Comment Letter #18, Dept. of the Interior (p.2), Comment Letter #17 Environmental Protection Agency (e.g. p. 2 and pp. 14-19), and A. K. Dunn's statement.

The comments refer to the meager descriptions of geologic and hydrologic conditions and the need for interpretive maps and cross-sections. The risks and consequences of potential flooding of the site are not addressed. The specific issues relating to the Mackay Dam were referred to by several participants.

2. Seismicity

Refer to Comment Letter #17, EPA, p. 17, and A. K. Dunn's statement.

The report refers to an upgrading from Seismic Zone 2 to Seismic Zone 3 with no reference to consideration of retrofit. Elsewhere, it describes the desert plain as an aseismic zone. This discrepancy should be resolved in the final statement and serious consideration given to the EPA suggestions.

3. The ^{129}I Issue

Refer to Comment Letter #11, P. G. Voilleque and his oral

statement, Comment Letter #17, EPA, (e.g. p. 4), Comment Letter #18, Dept. of the Interior (p. 7), O. J. Elgert comments (unnumbered).

The 68 mrad per year dose for an antelope thyroid is disturbingly high for a material with a half-life of 16 million years. If there are natural factors that will prevent the thyroid accumulation from steadily increasing if the effluent releases continue, these should be fully explained. Tables of radionuclide release do not properly account for ^{129}I. As this nuclide was not separately measured upon release, the best estimate should be develope

4. Terminology

Refer to written and Oral statements of A. E. Wilson, Comment Letter #18 (p. 1), and Comment Letter #17 (e.g. p.5

Some of these comments refer to ambiguous use of such terms as storage, disposal burial and discharge. Others call for definition of dose-related units such as rad and rem, and yet others refer to unconventional usage of the term "man-rem". The Board believes that accurate terminolc contributes to readier comprehension of the statement. In addition to suggested additions, a closer technical scrutir of all the definitions in the Glossary is recommended.

5. Calculational Methods

Refer to Comment Letter #16, Nuclear Regulatory Commission (p. 3).

The comment refers to the calculational method for environmental doses arising from gaseous effluent releases, which is claimed to be obsolete. The Nuclear Regulatory Commission has promulgated two Regulatory Guides, RG 1.109 and RG 1.111, which are widely accepted. A comparison with the values obtained using these guides should be considered for the final statement.

It may be noted that the International Standards Organization is currently attempting to develop an internationally accepted model for this purpose. The final environmental statement should address that standard if it becomes available before the environmental statement is completed.

Doses to Maximum Individuals

Refer to Comment Letter #17, EPA, Comment Letter #11, P. G. Voilleque, and the O. J. Elgert comments.

These comments refer to the desirability of estimating potential radiological doses to the so-called maximum individual. He is pictured as one whose dietary and other living habits contribute to his receiving a dose perhaps many times the average. For example, in the present context he may be a vegetarian who grows his own food in the area most affected by radioiodine releases.

Presentation of such data is generally felt to give a realistic appraisal of the upper limit of radiation risk to an individual.

7. Background Doses

Refer to Comment Letter #16, Nuclear Regulatory Commission, and the O. J. Elgert Comments.

Both of these sources point to various discrepancies. In particular, an apparent sharp difference between measured components, and estimated values for the same components, needs to be explained. Revision of the data should include change of terminology in the summary Table II-Lxl on page II-339. As it stands a "cosmic (nonionizing) source" giving 19 mR is a technical imcompatibility.

8. Meteorological Consequences of ^{85}Kr

Refer to Comment Letter #13, Neal Wilson.

This relates to an assertion in an article in SCIENCE 193-195 1976 that ionizing gases in the atmosphere may have meteorological consequences. The comment deserves to be addressed, although the answer may be that the issue is argumentative, and is being studied by established scientific review groups.

9. Cost/Benefit

Refer to Comment Letter and Hearing Comments, ERG, Inc.

The specific comments submitted by Mr. Marc W. Goldsmit relating to the cost benefit portions of the statement are relevant and should be considered in a revision and strengthening of the statement.

10. Omissions and Structure

Refer to Comment Letter and Hearing Comments, Paul Kiepe.

The observations made by Mr. Kiepe should be checked against the draft in the preparation of the final statement, in particular the comment on the need to make the statement more readable to the concerned layman.

11. Storage of Commercial Spent Fuel

Refer to Comment Letter #9, Public Service Company of Colorado.

In view of statements by both the Public Service Company and INEL staff, the status of storage of spent fuel from the Company should be addressed in the final environmental statement. This would apply equally to other commercial spent fuels not specifically recognized in comment letters.

Attachments to the Presiding Board's Report:

1. Comment Letter No. 18, see Page X-176
2. Supplement to Comment Letter No. 18, see Page X-181
3. Comment Letter No. 17, see Page X-159
4. Internal Memo, see Page X-196
5. Comment Letter No. 11, see Page X-141
6. Comment Letter No. 16, see Page X-158
7. Comment Letter No. 13, see Page X-145
8. Comment Letter No. 12, see Page X-142
9. Comment Letter No. 8, see Page X-136
10. Comment Letter No. 9, see Page X-139

UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
RICHLAND OPERATIONS OFFICE
P. O. BOX 550
RICHLAND, WASHINGTON 99352

OCT 6 1976

W. H. Pennington, Director
Office of NEPA Coordination
Headquarters

COMMENTS - DRAFT IDAHO ENVIRONMENTAL STATEMENT, ERDA-1536

Attached for your consideration is a list of comments on draft ERDA-1536. The list represents a composite of input from Battelle-Northwest and ERDA-RL. Questions regarding comments should be directed to G. J. Bracken of my staff (FTS 444-7326).

O. J. Elgert, Director
Nuclear Fuel Cycle and Production Division

NFCP:GJB

Attachment:
As stated

cc: G. Wehmann w/att.

COMMENTS - DRAFT IDAHO ENVIRONMENTAL STATEMENT

ERDA-1536

General: In most cases, sufficient information is presented to allow independent calculation and verification of radiation doses. There was, however, no mention made of dose models used in preparation of ERDA-1536. It would be helpful to include this information.

Consider including a summary table of doses from all pathways, along with the total dose to "maximum" individuals and population.

The document would be more useful as a reference tool if an index were included.

Specific Comments:

Section II, page 158, Table II - XXXVIII

The half-life for Cs-137 should be 30.2 years, not days.

Section II, page 159, Fig. II-34

The sharply defined lines on the soil column are somewhat misleading. They imply the radionuclides migrate downward without lateral spread.

Section II, pages 338-339, Table LXI

Some additional discussion is warranted pointing out that the data presented in Table LXI is used later to compare the impact of INEL operations with natural background radiation. Since this section sums up background radiation doses, should the information on radon (Section III, page 40) and the associated lung dose, plus any information on radium in water and the associated bone dose, be included?

The values listed in Table LXI under "Measured" are significantly less than the 145 mR presented under "Estimated." This discrepancy should be explained.

Section III, page 4, Fig. III-2

Resuspension of contamination from inactive disposal sites (dry sediments) leading to inhalation may be an important pathway.

Section III, page 5, second sentence

The sentence would be more clearly stated "The principal existing offsite exposure pathway to individuals is the consumption . . ."

Section III, page 16 and following

Several of these figures contain the words "3 feet in air." Others do not, but probably should. The term "3 feet above ground" would be more explicit than "3 feet in air."

Section III, page 33, Fig. III-23

The heading contains the words "man made gross counts" which are misleading and awkward. Perhaps "readings above background" would be better.

Section III, page 37, first paragraph

Estimate of 145 mrem/yr conflicts with thermoluminescent dosimeter measurements. Differing numbers should be reconciled and only the best estimate used for clarity.

Section III, page 43, third paragraph

It is not clear whether the thyroid doses are intended to be dose commitments or first year doses. If the latter, perhaps insert "in 1974" after "0.013 mrem."

Section III, page 44, last paragraph

Onsite airborne concentrations of I-129 were not given. How were doses via meat ingestion calculated? Working backwards from 21 mrem gives an I-129 concentration of 0.016 pCi/m^3

Section III, page 46, Table III-IV

It is unclear which isotope (I-131 or Sr-90) is intended under the "Average" column.

Section III, page 47

Discussion of I-131 ingestion via milk is cumbersome.

Section III, page 49, Table III-V

Why not use units of $10^{-12}\mu Ci/ml$ so that the entries would be close to unity?

Section III, page 59

It would be appropriate to include a description of how the genetically significant doses were calculated.

Section III, page 61

Dose of 68 mrad/yr to antelope thyroid should be 68 rad/yr. Our calculation:

$$\text{Dose rate mrad/yr} = 18.7(\rho\text{Ci/g})(\bar{E}\ \text{meV/dis})$$

$$= 18.7(6.9\text{x}10^4)(.06\ \text{meV/dis})$$

$$= 77\text{x}10^3\ \text{mrad /yr}$$

$$= 77\ \text{rad}$$

Section III, page 62

Summary section would be more useful if the information were to be organized in tabular form.

Section III, page 63 and following

Have any source term measurements been made or are the discharges all calculated values? The bases for the numbers should be stated.

Section III, page 71

Since "98% of the radioactivity has been discharged at two locations . . ., based on the assay of effluent streams at the time of release," it seems reasonable to have exact sampling practices defined for these two locations. This would allow the reader to place a confidence level on the numbers.

Section III, pages 63, 102, 129

For consistency, CPP should be changed to ICPP.

Section IX, Table IX-III

Reduction columns are given units of "Ci/yr and mR." Shouldn't this be "Ci/yr and man-rem"?

Section X, page 3

Reference 42 has been amended by 38 FR 25678 September 14, 1973, and 40 FR 7042 February 18, 1975. These would be more correctly cited as 40 CFR 50.

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