



Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes

Environmental Impact Statement

**Volume II
Comment Response Document**

**U.S. Department of Energy
Office of Nuclear Energy,
Science and Technology
Washington, D.C.**

April 1996



COVER SHEET

RESPONSIBLE AGENCY:

U.S. Department of Energy

TITLE:

Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes: Environmental Impact Statement

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ABSTRACT:

This Environmental Impact Statement (EIS) provides environmental and technical information concerning the U.S. Department of Energy's (DOE) proposal to establish a domestic source to produce molybdenum-99 (Mo-99) and related isotopes (iodine-131, xenon-133, and iodine-125). Mo-99, a radioactive isotope of the element molybdenum, decays to form metastable technetium-99 (Tc-99m), a radioactive isotope used thousands of times daily in medical diagnostic procedures in the U.S. Currently, all Mo-99 used in the U.S. is obtained from a single Canadian source. DOE is pursuing the Medical Isotopes Production Project in order to ensure that a reliable supply of Mo-99 is available to the U.S. medical community as soon as practicable. Under DOE's preferred alternative, the Chemistry and Metallurgy Research Facility at the Los Alamos National Laboratory (LANL) and the Annular Core Research Reactor and Hot Cell Facility at Sandia National Laboratories/New Mexico (SNL/NM) would be used for production of the medical isotopes.

In addition to the preferred alternative, three other reasonable alternatives and a No Action alternative are analyzed in detail. The sites for these three reasonable alternatives are LANL, Oak Ridge National Laboratory (ORNL), and Idaho National Engineering Laboratory (INEL). The analyses in this EIS indicate no significant difference in the potential environmental impacts among the alternatives. Each of the alternatives would use essentially the same technology for the production of the medical isotopes. Minor differences in environmental impacts among alternatives relate to the extent of activity necessary to modify and restart (as necessary) existing reactors and hot cell facilities at each of the sites, the quantities of low-level radioactive waste generated, how such waste would be managed, and the length of time needed for initial and full production capacity.

DOE issued a Draft EIS on December 22, 1995, and held a formal public comment period on the draft through February 9, 1996. Two public hearings were held at or near each of the four alternative locations during the comment period. Comments received and DOE's responses to those comments are found in the second volume of this EIS. The Final EIS contains change bars in the left-hand margin, reflecting DOE's consideration of the public comments.

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Section 1.0: Introduction



1.0 Introduction

In December 1995, the U.S. Department of Energy published the *Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes Draft Environmental Impact Statement* (DOE/EIS-0249D). DOE announced the availability of the Draft EIS for public review and comment in the *Federal Register* on December 22, 1995 (60 FR 66542); this announcement initiated a 49-day public comment period. DOE held eight hearings to receive oral and written comments and to exchange information with the public on the Draft EIS. Two hearings were held at each of the following locations: Idaho Falls, Idaho, on January 17, 1996; Oak Ridge, Tennessee, on January 25, 1996; Albuquerque, New Mexico, on January 30, 1996; and Los Alamos, New Mexico, on February 1, 1996. The public comment period ended on February 9, 1996. Comments provided by the public were considered in preparing this Final EIS.

This Final EIS has been made available for review at DOE Reading Rooms in Washington, D.C.; Idaho Falls, Idaho; Albuquerque, New Mexico; Los Alamos, New Mexico; and Oak Ridge, Tennessee. In addition, DOE has provided it to libraries at the Georgia Institute of Technology, the Massachusetts Institute of Technology, the University of Missouri - Columbia, and the Rhode Island Nuclear Science Center. Finally, DOE has distributed this document to individuals; organizations; and Federal, state, and local officials who commented on the Draft EIS or who are known to have an interest in the proposed project.

During the comment period, 61 persons offered formal comments at the 8 public hearings: 16 persons at the first Idaho Falls hearing; 25 at the second Idaho Falls hearing; 2 at the first Oak Ridge hearing; 2 at the second Oak Ridge hearing; 4 at the first Albuquerque hearing; 7 at the second Albuquerque hearing; 1 at the first Los Alamos hearing; and 4 at the second Los Alamos hearing.

Several of the people who offered oral comments at the hearings also provided written copies of their comments. Counting the written comments provided at the hearings, DOE received 101 letters and written statements (including one electronic mail message) related to the Draft EIS. Of the letters and written statements, 8 were from government agencies, 10 were from elected officials, 26 were from organizations, and 57 were from individuals. Tables 1-1, 1-2, 1-3, and 1-4 list the government agencies, elected officials, organizations, and individuals, respectively, who provided comments on the Draft EIS.

In the tables and in this document, letters and written statements are identified by a "C" followed by a 3-digit identification number (e.g., C027). Oral comment transcripts are identified by a 2-letter abbreviation for the hearing location, the hearing time ("A" for afternoon and "B" for evening), and a 2-digit identification number. For example, the comments made by the third commentator at the Idaho Falls evening hearing would be denoted as "IDB03."

Section 2.0 includes copies of all letters and written statements received by DOE and oral comments made at the public hearings. It also presents the DOE responses to the comments, reproduced on the page(s) following the copy of the letter, written statement, or oral comment transcript.

In cases where a person offered oral comments at a hearing and also provided a written copy of those same comments, both the transcript of the oral comments and the written copy of the comments are reproduced in this section. This is indicated in the following tables by a comment letter number, followed by a "/", followed by a hearing transcript number (e.g., C014/IDA03). The responses to those comments are provided on the page following the written copy of the comments.

In cases where a person offered different sets of comments, either orally or in writing, responses are provided following the copy of each individual oral comment transcript, letter, or written statement. This is indicated in the following tables by a comment letter number followed by an "&", followed by a hearing transcript designation and number (e.g., C013 & IDA11). The identification number for each oral and written set of comments offered by an individual is presented by that individual's name in the following tables.

A revision to the text of Volume I of the EIS is indicated by a change bar beside the affected text. For EIS changes resulting from public comments, the section of the EIS that was changed is identified in the response to the comment.

For additional reference material on acronyms, units of measure, bibliography listings, and glossary terminology, the reader is referred to Volume I of the EIS.

Table 1-1. Government Agencies Commenting on the Draft EIS

<u>Comment</u>	<u>Agency</u>	<u>Representative</u>
C060	U.S. Nuclear Regulatory Commission	Donald A. Cool
C066	State of Tennessee, Department of Environment and Conservation	Don Dills
C075	New Mexico Energy, Minerals & Natural Resources Department	Jennifer A. Salisbury
C086	State of Idaho INEL Oversight Program	Robert N. Ferguson
C091	U.S. Environmental Protection Agency, Region 6	Michael P. Jansky
C096	U.S. Department of the Interior, Fish and Wildlife Service	Jennifer Fowler-Propst
C097	State of New Mexico, Environment Department	Gedi Cibas
C098	Department of Health & Human Services, Food and Drug Administration	Peter Paras

Table 1-2. Elected Officials Commenting on the Draft EIS

<u>Comment</u>	<u>Official</u>	<u>Office</u>
C012	Pete T. Cenarrusa	Secretary of State, State of Idaho
C014/IDA03	Dirk Kempthorne	U.S. Senator, Idaho
C015/IDA02	Larry E. Craig	U.S. Senator, Idaho
C016/IDA04	Michael D. Crapo	U.S. Representative, Idaho
C017/IDA01	Philip E. Batt	Governor, State of Idaho
C030	Peter J. Angstadt	Mayor, City of Pocatello, Idaho
C037/IDB02	Jerry T. Twiggs ^(a)	President Pro Tem, Idaho State Senate
C071	Ginger Welch	Los Alamos County Council
C085	Alvino Lucero	Governor, Pueblo of Isleta
C095/IDB01	Linda Milam	Mayor, City of Idaho Falls
LAA01	Lawry Mann	Chairman, Los Alamos County Council
LAB03	Morris Pongratz	Los Alamos County Councilor

(a) The letter from Senator Twiggs was co-signed by 25 other Idaho State Senators

Table 1-3. Organizations Commenting on the Draft EIS

<u>Comment</u>	<u>Organization</u>	<u>Representative</u>
C005	American Nuclear Society	John Graham
C010/IDA05	Idaho Falls Symphony	Norma Jean Housley
C011	IEEE Nuclear Medical Sciences Technical Committee	Edward J. Hoffman
C013 & IDA11	Brady's	C.A. Brady II
C018	Voigt Davis Realtors	Don Davis
C023	Idaho Academy of Science	Philip A. Anderson
C031	ECSI Executone	Ted A. Kasper
C032/ALB07	Sierra Club - Albuquerque Group	Jay B. Sorenson
		Richard Barish
		Susan Gorman
C033/IDA10	American Nuclear Society, Idaho Section	John Commander
C036	San Jose Community Awareness Council	Dolores S. Herrera
C039	Four Hills Village Homeowners Association	Robert H. Multhaup
C045	Water Information Network	Susan Diane
C047	Health Physics Society	William A. Mills
C051	Bueno Los Alamos Surveillance Team	Bonnie Bonneau
		Ditto Nowakoski
C057	Thermo Technology Ventures	Richard F. Testa
C058 & IDB03	Idaho Brain Tumor Center	Francis Paul
		William J. Sewell
C065	Ruidoso Upper Canyon Association	Hazel C. Haynsworth
C067 & ORB01	Oak Ridge Local Oversight Committee	Amy S. Fitzgerald
C068	Nordion International	Dr. Iain Trevena
C074	Land and Water Fund of the Rockies	Everett DeLano
C074 & ALA04	Southwest Organizing Project	Michael Guerrero
C079 & IDA06	Greater Idaho Falls Chamber of Commerce	Con Mahoney
		C. Hugh White, Jr.
C082	Idaho Falls Medical Society	George Groberg
C093 & IDB06	Beauty for All Seasons	John V. Galazin
C094	Eastern Idaho Economic Development Council	Daniel Cudaback
C099	Council on Radioisotopes and Radiopharmaceuticals	Carl W. Seidel
C101	Nuclear Energy Institute	Felix M. Killar, Jr.
ALA01	Southwest Research and Information Center	William Paul Robinson
ALA03	New Mexico Physicians for Social Responsibility	Janna Rolland
ALB01	Greater Albuquerque Chamber of Commerce	Ron Motz

Table 1-4. Individuals Commenting on the Draft EIS

<u>Comment</u>	<u>Name^(a)</u>
IDB12	Dave Anderson
C003 & C100	Robert L. Anderson
IDA13	David Austin
IDA16	Cory Barnard
C002	Andy Baumer
ALB06	Bill Becker
C028	Clarence F. Bellem
IDB16	Barbara Berlin
IDB18	Bob Berlin
C001 & C038	William J. Berry
LAB04	Frances Berting
IDB21	Ellen Bingham
IDB24	Michael Breen
C064 & IDB13	Kent L. Brinker
ORB02	Al Brooks
C083	Brent J. Buescher
C007	Merle E. Bunker
C050	Debbie S. Christensen
C027	Robert B. Clark
IDB17	Ron Clawson
C019 & IDB22	Thomas M. Crawford
C020, C089 & IDA08	G. Ross Darnell
C061	Glen Darnell
C022	Steven A. Davies
C063, C078/LAB02	Michael & Ian Dempsey
C046	Kenneth D. Dobbin
IDA07	Bill Downs
C026	Sheryl Doyle
C072	David M. Ericson, Jr.
IDA12	Frank Fogarty
C009	David A. Freiwald
C073	George A. Freund
C043	Uri Gat
IDB15	Bill George
C055	Greg Gerber
C029	David A. Griffiths
ALB04	William Hadley
C004	Michael F. Hartshorne
C062	Bentley J. Harwood
C049	J. Stephen Herring
C084 & IDB19	John R. Horan

(a) Some of the letters have been signed by more than one individual. Only a single signator's name is used here.

<u>Comment</u>	<u>Name</u>
C008	John B. Hudson
C042	Paul Kasten
IDA14	Andrea Kennedy
IDB14	Joanne Long
ALB05	Peter Lundman
C041	Don & Elaine Mangum
C025	Kathryn A. McBride
C054	M. Ilene McKnight
C077 & LAB01	Eric McNamara
IDA15	Herbert Moore
ALA02	Karen Neuhauser
C076	Suzanne Noga
IDB11 & IDB26	Jon Ochi
IDB08	Linda Owens
C090	James N. Paglieri
ORA01	Bob Peelle
IDB10	Tom Piper
IDB07	Bill Pitchford
C088	Donivan Porterfield
C035	L. Rand Ricks
C040	Leslie Romriell
IDB25	Thomas J. Setter
C044	Robin Seydel
C021	Kathy Sica
C080	Robert L. Skinner
IDB04	Helen Stanton
C034	Ben Stutzman
C069	Brad L. Swanson
C092	Richard L. Taylor
C070 & IDB05	Roderic W. Thomas
IDB20	James H. Thorsen
C053	David Tracy
C059 & ALB03	Priscilla Tracy
IDB09	Linda Tucker
C056	Robert D. Ulrich
C052 & ORA02	Barbara A. Walton
C081 & ALB02	Ruth F. Weiner
IDA09	Linda Weiss
C087	Steve Yanicak
IDB23	Mark Young
C006 & C024	Steven K. Zohner
C048	Anonymous

Section 2.0: Comment Documents and Responses



William J. Berry
2660 St. Charles Ave.
Idaho Falls, ID 83404
208-523-4183.

Mr. Wade Carroll, MIPP-EIS Document Manager
U. S. Department of Energy
Office of Isotope Production and Distribution, NE-70
19901 Germantown Road
Germantown, MD 20874

Dear Mr. Carroll,

1 | Use of the Annular Core Research Reactor at Sandia National Laboratories and the Chemistry and
2 | Metallurgy Research Facility at Los Alamos National Laboratory may be the Department of Energy
3 | preferred alternative, but this alternative does not appear to be the best possible option on the basis of
4 | cost and mission. Furthermore, this preferred alternative requires transportation of Highly Enriched
Uranium (HEU) targets on public roads.

Use of the Power Burst Facility at the Idaho National Engineering Laboratory seems to be the most
favorable alternative from the standpoint of mission and cost. Transportation of HEU targets would
not require the use of public roads. At present, the only potential mission for the Power Burst Facility
is also a medical application which could be conducted concurrently with isotope production. As
stated in the Draft Environmental Impact Statement, privatization of Mo-99 production could also be
incorporated early in the process.

Please consider these comments in preparation of the Final Environmental Impact Statement.

Sincerely,


William J. Berry

Responses to Comment Letter C001

- 1 The Annular Core Research Reactor/Hot Cell Facility combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.
- 2 The comment correctly observes that, under the preferred alternative, targets containing unirradiated uranium-235 would be transported over public roads from LANL to SNL/NM. This operation would be carried out in accordance with applicable DOE and DOT regulations and would not measurably increase the risk associated with this alternative. The quantities of material transported, their chemical and physical form, and the packaging used during transport would combine to result in minimal risk to security or public health. (See Section 5.11 and Appendix B for a discussion of transportation impacts.)

It should be noted that one option for the SNL/NM alternative (identified in Section 3.3.1.3) is to fabricate the targets at the SNL/NM site, resulting in no transport of unirradiated targets over public roads. In addition, each of the other alternatives would require transport of radioactive materials (irradiated targets, low-level radioactive waste, or separated isotopes) over public roads. However, in no case would the necessity to use public roads substantially increase the risks of implementing the project at these sites.

- 3 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production. For any of the alternative reactors, if chosen, the reactor's primary mission would be designated as medical isotope production.
- 4 Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis.

January 17, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U.S. Department of Energy, NE-70
19901 Germantown Road
Germantown, MD 20874

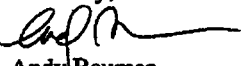
Dear Mr. Carroll:

I believe the DOE should reconsider the preferred alternative in the MIPP-EIS. For the following reasons, I believe the proposed PBF facility at the INEL site is a better alternative:

- "The DOE's position is that, in the long-term, the domestic production of Mo-99 should be undertaken by the private sector." The IBTC currently holds a lease on PBF for potential use as a Boron Neutron Capture Therapy treatment center. If PBF is chosen for the MIPP, IBTC would coordinate its reactor conversion plans with DOE, reducing costs and accelerating the schedule. The INEL alternative is the only one which clearly leads to privatization.
- The MIPP is not within the mission of the ACRR, therefore DOE "would retain the right for the ACRR to be available to support defense missions in times of national emergency..." This raises the possibility that isotope production could be suspended in time of emergency, creating a potential shortage the MIPP is intended to prevent. Isotope production for medical applications has been a part of the INEL's mission since 1980, allowing dedication of the PBF facility to the MIPP.
- The ACRR was identified as the preferred alternative "because it is a currently operating reactor, which reduces both cost and schedule uncertainties associated with producing Mo-99..." While the uncertainty of costs and schedules may be higher at PBF, both the ACRR and PBF are estimated to be 28 months to full production, while facility preparation costs at PBF are \$2M less and annual operating costs are 45% lower (\$8.4M vs. \$12.2M) at PBF.
- All operations can be conducted on the INEL with little, if any, transportation on public highways. The preferred alternative requires shipping the targets from LANL to SNL, and wastes from SNL to NTS, on public highways.

In summary, I feel there are specific technical reasons why the PBF facility at the INEL is a better alternative than the preferred alternative at the ACRR for the MIPP.

Sincerely,


Andy Baumer
648 Adell Ave.
Idaho Falls, ID 83402

Responses to Comment Letter C002

- 1 Comment noted.
- 2 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE. The Department is aware of this potential for the INEL alternative. Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.
- 3 If the Annular Core Research Reactor (ACRR) is selected for the Mo-99 production project, its mission would be changed from defense testing to medical isotope production. It is possible that the ACRR could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.
- 4 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.
- 5 The comment correctly observes that, under the preferred alternative, targets containing unirradiated uranium-235 would be transported over public roads from LANL to SNL/NM, and low-level radioactive waste would be transported from SNL/NM to the Nevada Test Site (NTS) for disposal. These operations would be carried out in accordance with applicable DOE and DOT regulations and would not measurably increase the risks associated with this alternative. The quantities of material transported, their chemical and physical form, and the packaging used during transport would combine to result in minimal risk to security or public health. (See Section 5.11 and Appendix B for a discussion of transportation impacts.)

It should be noted that one option for the SNL/NM alternative (identified in Section 3.3.1.3) is to fabricate the targets at the SNL/NM site, resulting in no transport of unirradiated materials over public roads. In addition, each of the other alternatives would require transport of radioactive materials (irradiated targets, low-level radioactive waste, or separated isotopes) over public roads. However, in no case would the necessity to use public roads substantially increase the risks of implementing the project at these sites.

Jan. 1, 1996
115 Columbia SE
Albuquerque, New Mexico 87106
505-255-5462

Mr. Wade Carroll, NEPA Document Manager
Office of Isotope Production and Distribution, NE-70
U. S. Department of Energy
19901 Germantown Road,
Germantown, Maryland 20874-1290 REF: DOE/EIS-0249D

Dear Mr. Carroll:

I would like to make a comment on the health and safety of the general public of the Albuquerque area, as related to the Molly 99 reactor project.

At the first presentation on the isotope reactor, December 1994, your spokesman included a statement the reactor will " add, unfortunately". (my emphasis) to the background level of radiation in our environment here. The Environmental Assessment also confirms this, and states there are already 8 other hazardous sources of radionuclide pollutants at the Kirtland AFB/Sandia National Lab complex. The draft statement does not reflect consideration of this complex of pollutants, and unknown future DOE projects, which may create a serious public health problem. You surely know of the DOE and DOD talk to place a large supply of war head plutonium, and other waste categories here in the city.

My point is that we are told repeatedly that this area already has a high level of radioactivity from past above ground nuclear weapons tests, accidental nuclear reactor leaks, undocumented accidents with lab plutonium, and the high altitude radiation. Therefore it goes against common sense to place the isotope production here, another source of pollutants in our environment. The Molly 99 medical isotopes are a truly good medical tool. I have been the beneficiary in recent years of their benefits. But the waste produced by the reactor process is not good for humans.

If you will notice the site for the reactor is within eyesight of a metropolitan area of nearly 600,000 people, and within a stone's throw is the Veterans Administration Hospital and the Lovelace Hospital in which are several thousand people who are usually in weakened states of health, a time of being most vulnerable to contaminations. Several public schools and a major airport terminal with hundreds of thousands of people passing through each year are within the same visual range of the isotope reactor site.

In my opinion, it is foolhardy, dangerous, and disregardful of public health to place another radioactive emitter source such as the medical isotope reactor in this area. I would like to see the EIS address the above mentioned factors and conditions in relation to public health problems with the reactor. Your overall program of activities treats New Mexico as a vacant desert state and the city of Albuquerque likewise. This is not true.

And, the economic structure of this project amounts to a public subsidy to a private sector company, something we are suppose to be moving away from. Your letter presents the problem as one of a foreign supplier versus a domestic source. This is in violation of the spirit of the NAFTA accords in which we trade and work as friends in one common market.

Sincerely,


Robert L. Anderson

Responses to Comment Letter C003

- 1 The EIS is required to consider the cumulative impacts of the proposed action with other ongoing or anticipated actions at the candidate sites, and it does so in Section 5.16. With respect to radiological air quality, the proposed action plus the other activities at SNL/NM would result in a dose of 0.17 mrem to the most exposed individual. This is less than 2% of the EPA standard for radionuclide emissions from DOE facilities (10 mrem/year).

If the proposed action were implemented, the collective dose to the population within 50 miles of SNL/NM would increase by less than 0.01% compared to that from background radiation. This small increase from normal operation of the isotope production facilities, or from any reasonably foreseeable accidents, would not be expected to measurably increase the risk of cancer fatality experienced by the 610,000 residents living in the vicinity of the laboratory.

- 2 The Department has proposed the Medical Isotopes Production Project to ensure that a reliable supply of Mo-99 is available to the U.S. medical community. If the Department decides to pursue this project, the Mo-99 would be sold at prevailing world market rates. DOE does not intend to artificially lower the cost paid by pharmaceutical companies for Mo-99 and would thus not artificially increase the profits realized by these companies on sales of Mo-99. Therefore, DOE believes that it would be incorrect to label isotope production by the Department as a subsidy to private industry or "corporate welfare."

If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage. The goal of the proposed project is to ensure that a supply of Mo-99 is readily available to the U.S. medical community.

As stated in the EIS, DOE supports the production of Mo-99 by private industry. If a private company begins reliably producing Mo-99 in the U.S., DOE could phase out its production of Mo-99.

- 3 The problem with the Mo-99 supply situation is not that the supply is from a foreign country. The problem is that the entire U.S. supply comes from a single source. It should also be noted that this single source accounts for about 85% of the world supply of Mo-99. If this source were to become unavailable, production facilities in other countries would most likely focus on meeting their own needs first and, in any case, would not be able to meet even half of U.S. demand for Mo-99. Given this supply situation, the Department has proposed establishing a domestic production source to ensure that a reliable supply of Mo-99 is available to the U.S. medical community.

1568 Eagle Ridge Court NE
Albuquerque, N.M. 87122
January 3rd, 1996

Mr. Wade Carroll, EIS Project Manager
Office of Nuclear Energy, Science and Technology (NE-70)
U.S. Department of Energy
19901 Germantown, Maryland 20874-1290

Dear Mr. Carroll,

1 | I am responding to the proposed Medical Isotopes Production Project and the draft of the related Environmental Impact Statement (EIS). Thank you for providing me a copy. As a citizen I am embarrassed that the Department of Energy has been forced to proceed with an EIS when I believe that the Environmental Assessment already prepared should have been completely adequate.

I wonder if those small groups opposed to all things nuclear have chosen to fight this battle as part of a general campaign of opposing anything that the Department of Energy does. This is a tactical error on their part. Their efforts are much needed elsewhere. I believe that there are terrible environmental tragedies throughout the globe that would profit from measures much more stringent than an EIS. The biologically unbelievable overpopulation of the earth will apparently soon take us past the carrying capacity of the earth even if the biologic diversity our last wild sanctuaries are destroyed in favor of gaining a few marginal resources. With gifts of antibiotics and some food (but no birth control) the human breeding population has temporarily exploded pending nature's inevitable, brutal checks on overpopulation. Our children suffer the consequences. Let the anti-medical isotopes production forces direct their efforts to the real problems of our world.

I am a physician boarded by the American Board of Radiology and the American Board of Nuclear Medicine. I believe strongly in the benefits of medical isotopes that I use daily for the care of patients with a wide spectrum of disease and injury. The NAFTA agreement and stories about Canada's willingness to build a new facility for Mo-99 production does not persuade me that the DOE project should stop. There is great wisdom in maintaining a back-up source of Mo-99. As an American taxpayer I want to see this project completed with a minimum of artificial expense. Committed as you are to finishing the EIS process, I hope that responsible administrators will rise above the political turmoil and proceed promptly with the medical isotopes project.

Sincerely,


Michael F. Hartshorne M.D.

Response to Comment Letter C004

- 1 The Department prepared a environmental assessment on the *Proposed Production of Mo-99 and Related Medical Isotopes at Sandia National Laboratories/New Mexico and Los Alamos National Laboratory*. This environmental assessment was distributed for public comment during the pre-approved review period on February 7, 1995. Based on the environmental assessment and on public comments received, the Department decided that it would be appropriate to prepare an environmental impact statement.



AMERICAN NUCLEAR SOCIETY

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Mr. Wade Carroll
NEPA Document Manager
Office of Isotope Production and Distribution, NE-70
U.S. Department of Energy
Germantown, MD 20874

December 20, 1995

Medical Isotope Production EIS

Dear Mr. Carroll,

The American Nuclear Society endorses and supports the establishment of the reliable domestic supply of Mo-99 proposed in the U.S. Department of Energy's Draft Environmental Impact Statement for Medical Isotope Production and urges that the work necessary to effect that source of supply be accomplished on the most expeditious schedule.

The United States of America has been a world leader in, and a large user of, radioisotopes for medical and research applications. The corresponding national need for reliable supplies of isotopes to support these important activities was documented in the recent National Academy of Sciences- Institute of Medicine report. It is particularly urgent that the U.S. Government establish a reliable uninterrupted supply of Mo-99 as the source of Tc-99m, the main radioisotope used in diagnostic nuclear medicine, which now amount to more than 35,000 procedures daily.

In view of the established public need for these radioisotopes, the uncertainty in the current supply, and the current lack of backup capacity, the Society strongly endorses DOE's proposed action for establishment of a reliable domestic source of these materials and urges that the steps required to implement that action be accomplished as rapidly as possible.

Yours sincerely

A handwritten signature in dark ink, appearing to read "John Graham".

John Graham
President

Leaders in the development, dissemination and application of nuclear science and technology to benefit humanity.

JOHN GRAHAM, PRESIDENT

BNFL, Inc.
5655 S. Yosemite Street, Suite 100
Englewood, CO 80111 USA

Tel: 303/ 694-0700
E-Mail: JGraham@bnfl.org
Fax: 303/ 694-1816

Response to Comment Letter C005

- 1 Comment noted.

Steven K. Zohner
1042 Grizzly Ave.
Idaho Falls, ID 83402
Ph. 208-524-4176
Work Ph 208-526-3669
January 17, 1996

Mr. Wade Carroll
EIS Project Manager
Office of Nuclear Energy, Science and Technology (NE-70)
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874-1290

Subject: Comments on DOE'S draft medical isotope production project:
molybdenum-99 and related isotopes environmental impact statement
(DOE/EIS-0249D)

Dear Mr. Carroll:

I believe that the draft EIS shows that the INEL has significant advantages over DOE's preferred site. Here is a listing of some of those advantages.

Security

Unirradiated U-235 creates significant security requirements. Facilities at the INEL using or storing purified U-235 are kept under strict security. The INEL has a long history of working with and protecting the unirradiated U-235. Currently, the INEL has in place adequate security procedures and trained personnel to meet DOE's security requirements.

Shared cost

The INEL "PBF lease agreement in place Idaho Brain Tumor Center for Boron Neutron Capture Therapy. Idaho Brain Tumor Center interested in shared cost venture."

Privatization

"Mo-99 production feasibility studies addressed the possibility of conducting all processes in stand alone cells purchased from a viable supplier. Such an arrangement would be of great financial advantage, if these cells could be located in an existing facility close to the Power Burst Facility and possibly even be considered a single facility with the Power Burst Facility"

"The Power Burst Facility could be used to produce Mo-99 and concurrently as a Boron Neutron Capture Therapy treatment center. This approach could incorporate privatization of Mo-99 production early in the process."

Mr. Wade Carroll
January 17, 1996
Page 2

Site modifications

"However, it may be feasible to erect an additional annex to the Power Burst Facility structure, shielded from the main reactor building, and connected to existing Power Burst Facility effluent ventilation and radiation monitoring systems. Such a facility would provide great advantage to the use of stand-alone manufactured cells and eliminate transportation time and liability."

Table 3-2, shows that the hot "cells at the INEL are adequate but would require minor modifications." while DOE's preferred site would require "New hot cells required for full production."

The greatest modifications are necessary at the preferred site. "The planned facility modifications at SNL/NM are the most extensive required at any site."

Reduced radiation exposures.

Table 3-1, shows the dose to the population within 80 km of the INEL project would be over 10 times lower than DOE's preferred site in New Mexico.

Table 3-1, shows the radiological dose to transportation crews and to the public is lower at the INEL than DOE's preferred site.

Table 3-1, shows that the dose to the maximally exposed individual near the INEL would receive nearly 10 times less dose than the maximally exposed individual at DOE's preferred site from an accident during target processing.

Table 3-1, shows that the dose to the population within 80 km of the INEL due to a target processing accident is 10 times lower than DOE's preferred site.

Table 5-3, and Table 5-8,

The dose to off site resident at the preferred site are 10 times higher than for the INEL option.

The dose to on site workers are 10 times higher for the preferred site than for the INEL option.

The off site population dose is 2 times higher than the INEL option.

The off site population dose from hot cell operation at the preferred site is 10 times higher than the INEL option.

Mr. Wade Carroll
January 17, 1996
Page 3

Accident Impact Reduction

Table 3-1, target processing at the INEL is shown to be 10 times less likely to have a accident per year than any other option. Other types of accidents are about the same for each site. This 10 fold reduction at the INEL is impressive in preventing potential harm.

Cost Savings

Table 3-1, shows that the INEL site will be \$ 2,000,000 less expensive to construct than DOE's preferred site. The yearly operating costs at the INEL will be nearly \$ 4,000,000 less than DOE's preferred site.

The INEL option is less expensive than DOE's preferred site. The total savings of the INEL option over DOE's preferred site is 25 million dollars. This includes facility and labor costs for 1996 through 1999.

Schedule from ROD

The schedule from the record of decision to full operation is the same for the INEL and DOE's preferred site.

Isotope production experience

The INEL has 35 years of isotope production experience. DOE's preferred site has no isotope production experience.

Air quality

"Neither INEL nor any of the surrounding counties is designated as a nonattainment area (40 CFR 81.313) for the National Ambient Air Quality Standards (40 CFR 50)."

"Of the sites under consideration in this EIS, the only site that is located in an area that has nonattainment status for a criteria pollutant is SNL/NM, which is in an area that is nonattainment for carbon monoxide."

Waste management

"Low level radioactive waste would be shipped from SNL/NM to the Nevada Test Site for disposal." *The state of Nevada is currently fighting this site in court.*

Waste disposal at the INEL option. "In this alternative, all three steps (fabrication, irradiation, and processing) would be carried out on site at INEL." "INEL is a cradle to grave waste management operation.."

"Cradle to grave waste management. No shipping, all waste disposed at INEL facilities. Liquid low level waste treated and stored on site."

Mr. Wade Carroll
January 17, 1996
Page 4

Spent nuclear fuel

"Adequate wet and dry spent fuel storage exists on site."
This is referring to the INEL option.

DOE's preferred option will result in having to ship the spent fuel to the INEL. The state of Idaho may not be willing to accept this waste.

Nuclear waste issues

The governor of Idaho and DOE signed an agreement in October 1995 that allows spent nuclear fuel shipments to the INEL only under specific circumstances. The pact prohibits any shipments of spent fuel to Idaho after April 30, 1999, until shipments of transuranic waste from the INEL to the Waste Isolation Pilot Project in New Mexico or another facility are proceeding at a specified rate.

The INEL option for the production of medical isotopes has the ability to store the spent fuel at the INEL.

These advantages of the INEL site are rather impressive. It is my belief that because of these advantages the INEL would be a better choice than DOE's preferred site.

Sincerely,

Steven K. Zohner

Steven K. Zohner

Responses to Comment Letter C006

- 1 Comment noted. This letter discusses several important factors regarding the proposed project. Discussions of many of these factors (security, reduced radiation exposures, accident impact reduction, air quality, waste management, spent nuclear fuel, and nuclear waste issues) are provided below.

The other factors discussed in the letter (shared cost, potential privatization of the production operations, modifications required, cost and schedule, and isotope production experience on site) are also important. These factors will be considered as the Department formulates its decision on the project.

- 2 This is true, but this is also true of the other sites. Each has a long history of handling and storing strategic special nuclear materials. Physical security requirements for materials are delineated in 10 CFR 73. All facilities, federal or commercial, are subject to those requirements. On all sites, security requirements for special nuclear materials are part of the special nuclear materials control program. Handling and storage of unirradiated targets is specified to be under the special nuclear materials control program at each site. This is stated for SNL/NM in Section 3.3.1.3. The physical protection requirements for shipment of unirradiated targets are discussed in the same section and reference the requirements delineated in 10 CFR 73.67(e).
- 3 The results in Table 3-1, and the corresponding results reported in Section 5 of the EIS, indicate that while the dose to the population within 80 km of INEL is lower, the doses to individual offsite residents and onsite workers from facility operation are similar or higher for the INEL alternative compared to the preferred alternative at SNL/NM. However, the dose to the maximally exposed offsite individual for either alternative is less than 2% of the EPA standard for radionuclide air emissions at DOE facilities (10 mrem/year).

The lower population within 50 miles of INEL results in a smaller collective dose from air emissions at that site, whereas the collective doses to the public and crew from transportation are similar for the two alternatives. The risk of latent fatal cancer in the offsite population as a result of normal operation or accidents is much lower than 1 for both alternatives, such that no health consequences would be expected for any reasonable duration of the project.

- 4 Two types of target processing accidents were evaluated at all sites: one for processing Mo-99 targets and one for processing iodine-125 targets. Both accidents were evaluated at INEL (see Table 5-44 and Table 5-45); however, only the accident resulting in the highest potential offsite consequences was reported in the summary (Table 3-1). At INEL, the iodine-125 target processing accident would result in the highest potential offsite consequences. For the other alternatives, the Mo-99 target processing accident was reported in the summary because the potential consequences were greater than for the iodine-125 target processing accident at those sites.

The expected frequency of the Mo-99 target processing accident was assumed to be 1.0/year at all sites because the nature and scope of the process would be similar under all alternatives. The expected frequency of the iodine-125 target processing accident is lower at all sites (0.1/year) because fewer targets of this type would be processed under any alternative. In all cases, the risk of latent fatal cancer from accidents during target processing is much lower than 1, and the differences in risk between the alternatives are not likely to be a major consideration in siting the project.

- 5 The nonattainment status for carbon monoxide in the Albuquerque area would not affect the ability to site or operate the Medical Isotopes Production Project at SNL/NM. The isotope production mission would not result in a measurable increase in emissions of criteria pollutants and therefore would not contribute to the degradation of air quality in the region.
- 6 The Department recognizes that "cradle-to-grave" waste management is a benefit of the INEL and LANL alternatives and will consider this factor in making its decision on the proposed project.

Regarding the issue of shipping low-level radioactive waste to the Nevada Test Site (NTS) under the preferred and ORNL alternatives, the NTS is preparing a site-wide environmental impact statement and has included waste generated from the Mo-99 mission in the quantities and description of materials proposed to be stored on the site. The Department believes that any uncertainty surrounding NTS's ability to accept the waste from the Mo-99 mission is sufficiently small that there will not be an impact on a proposed Mo-99 program. The ultimate disposition of waste generated under the proposed project may change based on future decisions resulting from the DOE Waste Management Programmatic Environmental Impact Statement (DOE 1995a).

- 7 Each facility has at least 5 years worth of spent fuel storage capability at full production levels. Final disposition of all spent fuel generated in the DOE complex, including the disposition of spent fuel from the INEL option, will be in accordance with the DOE Spent Nuclear Fuel Programmatic EIS (SNF PEIS) (DOE 1995b) Record of Decision.

2218 46th St.
Los Alamos, NM
87544
January 13, 1996

Mr. Wade Carroll
EIS Project Manager
Office of Nuclear Energy Science
and Technology
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874-1290

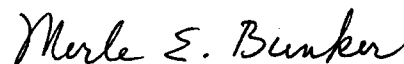
Dear Mr. Carroll:

1
2

I strongly believe that the Omega West Reactor is the best choice in the United States for producing Molybdenum-99 for the U.S. medical community. It is certainly the least expensive choice, and I am convinced that it could go into production much sooner than any of the other possibilities.

Unfortunately, I am going to be out of the country for the next 30 days and cannot, at this time, give you all the reasons that back up my above views. I will get in touch with you again in mid-February.

Sincerely yours,



Merle E. Bunker

Responses to Comment Letter C007

- 1 Comment noted.

- 2 According to the cost and schedule estimates contained in Section 5.22 of the EIS, the LANL alternative along with the SNL/NM alternative involves the second highest estimated cost, both in terms of preparation costs and operating costs; however, the uncertainties associated with the LANL estimates are less than for the ORNL and INEL estimates. The revised cost estimates in Section 5.22 of the Final EIS show that the LANL alternative preparation costs are equivalent to the SNL/NM alternative and are lower than the ORNL estimate, but higher than the INEL estimate. The estimated time to full production in both the Draft EIS and Final EIS is shorter for the LANL alternative than any of the other alternatives.

Subject: <NULL>
Author: flyreel@dns.ida.net_at_Internet at X400PO
Date: 1/18/96 8:46 PM

X-Sender: flyreel@mail.ida.net
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"

Please send this note to:
Mr. Wade Carroll, MIPP EIS Document
Manager, Office of Nuclear Energy, Science and Technology (NE-70), U.S.
Department of Energy, 19901 Germantown Road, Germantown, Maryland 20874.

Thanks

Mr. Carroll;

>The INEL's Power Burst Facility is being considered for producing medical
>isotopes for cancer and heart disease, screening and therapy. A preliminary
>Environmental Impact Statement by the DOE lists it as one of four
reasonable
>options among 17 considered for producing a widely used medical isotope.

>molybdenum-99.

1 |

I would like to see the facility activated and used. We have already paid
for the reactor and it is ideal for the BNCT treatment. We have the
technical personnel here at the INEL to operate the plant. I see no reason
2 | to build an new plant, that will have to be cleaned up eventually.
Unneeded expense.

Some object that Idaho is so remote. Yeah, remote, 5 hours by air from
anywhere in the US.

Thank you.

John B. Hudson
235 Clary Ave
Idaho Falls, Id 83401

jnh@inel.gov, work

NO FEAR, Sit Down, Buckle Up, LogOn!

Responses to Comment Letter C008

- 1 Comment noted.
- 2 None of the options involve the construction of a new plant. The SNL/NM option, however, does involve the construction of a new hot cell within an existing building. Also, the INEL option may involve the construction of hot cell facilities adjacent to the PBF facility.

21 Jan 1996

Wade Carroll, MIPP-EIS
Document Management
US DOE, NE-70
19901 Germantown Rd.
Germantown, MD 20874

Re: Draft EIS for Medical Isotopes Project, Mo-99, et al

Dear Mr. Carroll:

Background:

- 1) I am a member of DOE/EM's SNL/ITRI SSAB, representing the Four Hills Homeowners Association. But this letter presents my own questions, and not yet officially those of the HoA or the SSAB.
- 2) I have studied the Summary and Sections 1-2 of the DEIS, and have skimmed the remainder. The document refers to the vulnerability of interruption of supply of Mo-99 to the U.S. A DOE official here have referred to it as a 'foreign' [vs U.S.] source.

Questions:

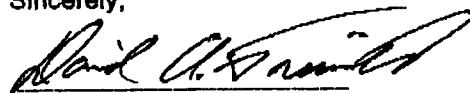
1

Question 1: Do you have official written notice from the Canadians stating that they may not be a reliable supplier of Mo-99 in the future, and that the U.S. should consider developing alternate sources, and if so, may I have a copy of that correspondence?

2

Question 2: Regarding references to it as a 'foreign' source as if that were 'bad,' I note that Canada has, for a LONG time, been a good U.S. trading and defense partner. And the recently signed NAFTA and GATT only emphasizes things. So is there now something strategically or politically 'bad' about having Canada as a Mo-99 supplier?

Sincerely,



David A. Freiwald, Ph.D.
1708 Soplo Rd., SE
Albuquerque, NM 87123-4485

Responses to Comment Letter C009

- 1 The Department has not received, nor does it expect to receive, written notice from Nordion International or the Canadian government stating that they may not be a reliable supplier of Mo-99 in the future. (See letter from Nordion International-C068.)
- 2 The problem with the Mo-99 supply situation is not that the supply is from Canada (or from any other foreign country, for that matter). The problem is that the entire U.S. supply comes from a single source. It should also be noted that this single source accounts for about 85% of the world supply of Mo-99. If this source were to become unavailable, production facilities in other countries would most likely focus on meeting their own needs first and, in any case, would not be able to meet even half of U.S. demand for Mo-99. Given this supply situation, the Department has proposed establishing a domestic production source to ensure that a reliable supply of Mo-99 is available to the U.S. medical community.



John LoPiccolo, Music Director & Conductor

Wade Carroll
MIPP-EIS Document Manager
US Department of Energy
Office of Isotope Production and Distribution, NE-70
19901 Germantown Rd.
Germantown, MD 20874
(301) 903-7731
fax (301) 903-5434

January 16, 1996

1 | The Board of Directors and administrative staff of the Idaho Falls Symphony is in support
2 | of the production of medical isotopes for cancer and heart disease screening and therapy at
3 | the Idaho National Engineering Laboratory.

We believe the Power Burst Facility is technically the superior facility for the project. In addition, the location would eliminate the need for shipment of low-level waste across state lines.

We also believe the Idaho Falls community would provide the necessary infrastructure, including medical, educational, and cultural facilities, to support the project and its personnel.

The Idaho Falls Symphony is an important cultural resource for Idaho Falls and the surrounding area. This helps attract a high caliber of educated professionals and skilled personnel to the area with their families, to support continued progress at the INEL. In turn, the overall economic health of our area is crucial to maintaining the fiscal integrity or our community's cultural base, including the Symphony.

In light of the importance of this project for its lifesaving mission, and the mutual benefit to the community of locating the project here, we hope your decision will be to locate this project at this site.

Sincerely,

The undersigned members of the Board of Directors and Staff of the Idaho Falls Symphony.

William Hunt, Executive Director
Norma Jean Housley, Pres.
Paul L. Hower, Jr., Member
Jerry Shively, Member
Ralph Hartwell
Tamar Sjogensen, Past President
Bill Borchert, 2nd President
John Roberts, Conductor
Bodford A. Cannon
Marcy Mason
Exid via house
Maria S. Anderson

Responses to Comment Letter C010

- 1 Comment noted.
- 2 Each of the reasonable alternatives analyzed in the EIS is capable of meeting the selection criteria for a Mo-99 production facility and thus is capable of satisfying the purpose of and need for the proposed project.

The Department recognizes that "cradle-to-grave" waste management is a benefit of the INEL and LANL alternatives and will consider this factor in making its decision on the proposed project.
- 3 The INEL and the other alternative sites have the necessary infrastructure to support the proposed project.



IEEE Nuclear Medical Sciences Technical Committee

CHAIR: *Edward J. Hoffman*
 (310) 825-8851
 FAX (310) 825-4517
 EMail: *ieee_ejh@mail.nuc.ucla.edu*

MEMBERS: *A. Bertrand Brill*
Simon R. Cherry
Magnus Dahlborn
Stephen E. Derenzo
Grant T. Gillberg
Ronald J. Jaszczak
Michael E. King
Richard Leahy
Jorge Llacer
William W. Moses
Orhan Nalcioglu
Ronald Nutt
Manbir Singh
Chris J. Thompson
Benjamin M.W. Tsui

January 5, 1996

Mr. Wade Carroll
 NEPA Document Manager
 Office of Isotope Production and Distribution, NE-70
 United States Department of Energy
 Germantown, MD 20874

Attn: Medical Isotope Production EIS

Dear Mr. Carroll:

The IEEE Nuclear and Plasma Sciences Society endorses and supports the establishment of the reliable domestic supply of Mo-99 proposed in the U.S. Department of Energy's Draft of an Environmental Impact Statement for Medical Isotope Production and urges that the work necessary to effect that source of supply be accomplished on the most expeditious possible schedule.

The United States of America has been a world leader in and the largest user of radioisotopes for medical and research applications. The corresponding national need for reliable supplies of isotopes to support these important activities was documented in the recent National Academy of Sciences-Institute of Medicine report

It is clearly in the best interest of the citizens of the United States to assure an uninterrupted source of radioisotopes for research and biomedical applications, and it is particularly urgent that the U.S. Government establish a reliable uninterrupted supply of Mo-99 as the source of Tc-99m, the main radioactive isotope used in diagnostic nuclear medicine.

In view of the established public need for these radioisotopes, the uncertainty in the current supply, and the current lack of backup capacity the IEEE Nuclear and Plasma Sciences Society strongly endorses DOE's proposed action for establishment of a reliable domestic source of these materials and urges that steps required to implement that action be accomplished on the most aggressive possible schedule

Yours Very Truly,

Edward J. Hoffman, Ph.D.
 Professor of Pharmacology and Radiological Sciences
 UCLA School of Medicine
 Chairman, IEEE NPSS Nuclear Medical and Imaging Science Technical Committee

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Response to Comment Letter C011

- 1 Comment noted.

PETE T. CENARRUSA
SECRETARY OF STATE

SEN TOMMA
CHIEF DEPUTY
SECRETARY OF STATE

700 West Jefferson
 PO Box 8700
 Boise, Idaho 83720-8000
 Telephone 208 334-3300
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STATE OF IDAHO
SECRETARY OF STATE

Corporate Affairs
 208 334-3301
Uniform Commercial Code Division
 208 334-3301
Records 208-334-3307
Trademark/Service Division
 208 334-3300
Licensing Division
 208 334-3302
Legislative and Executive Affairs
 208 334-3300
Fiscal Division
 208 334-3300
Computer Services
 208 334-3304

January 16, 1995

Honorable Hazel O'Leary
 Secretary of Energy
 1000 Independence Ave., S.W.
 Washington DC 20585

Dear Secretary O'Leary:

The Idaho National Engineering Laboratory's (INEL) Power Burst Facility (PBF) reactor has recently been listed as the potential site of the United States sole source of Molybdenum-99 (Mo-99) isotope production. I believe that the PBF represents the most technologically compatible, economically efficient and environmentally sound facility for domestic Mo-99 production and urge its designation as such.

Idaho is proud that the PBF will soon focus the world's attention on the implementation of Boron Neutron Capture Therapy (BNCT) at the Idaho Brain Tumor Center (IBTC). The technological partnership between DOE and IBTC is a credit to Idaho and the nation. It is my hope the victims whose maladies will be treated here, whether from Idaho, the United States or around the world, will come to understand, as you and I do, the broad advantages to our lives this government/private sector relationship creates.

The production of medical isotopes and the practice of BNCT are technologically compatible projects which can be carried out more efficiently and more cost effectively at the INEL's PBF reactor than at her facilities currently under evaluation by DOE. Both technologies require a constant supply of neutrons and a high flux of neutrons. The PBF produces the ideal neutron flux for BNCT and for medical isotope production. Initial engineering studies show that the Idaho PBF facility can be readied for medical isotope production in 6-12 months less time and for \$5 million less than any of the other three finalists being considered for the project.

5 High product quality and consistency of supply are the two most important ingredients when considering a facility for the production of medical isotopes. The Advanced Test Reactor (ATR), also located at the INEL, has been producing specialty isotopes for many years. The expertise is presently in place to produce isotopes to the highest quality standards. With the PBF serving as the main isotope production facility the ATR can fill in and maintain a constant production schedule when the PBF is down for routine maintenance and refueling. Idaho offers a twin reactor concept that assures consistency of supply for many years to come.

6 The U.S. currently has no domestic supply of the most widely used medical isotopes. The Idaho PBF reactor can supply 100% of the domestic demand for Mo-99 and still have excess production capacity for the exportation of Mo-99.

The INEL's PBF reactor is clearly the technologically superior choice for isotope production with minimal environmental consequences. Idaho's long history as the world leader in nuclear materials management make it ideally suited for the project.

Support for the project both on a local and state level, is strong. Downsizing of INEL projects and personnel make it imperative that new missions are created to save and expand existing capabilities.

7 DOE intends to privatize the isotope production program. IBTC's present 30 year lease of the PBF reactor puts the privatization plan into effect immediately. No other federal missions will interfere with the operation of Mo-99 production at the PBF, unlike
8 some of the other sites under review.

The humanitarian aspects of the combined National Center for BNCT and the isotope production project makes the INEL's PBF the hands down winner for the national as well as the State of Idaho.

9 After considering the lower start-up costs, mission compatibility and technological superiority, it is clear that INEL's PBF is the logical home of the United States Mo-99 production source.

Sincerely,



Pete T. Cenarrusa
Secretary of State
State of Idaho

Responses to Comment Letter C012

- 1 Comment noted.
- 2 Comment noted.
- 3 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be useable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 4 As shown in Section 5.22, the estimated cost to prepare the INEL facilities is \$2.4 million less than the closest alternative (the preferred alternative), and the estimated time to prepare the INEL facilities for full production is tied with the preferred alternative.

The uncertainties associated with the estimated cost of the INEL and ORNL alternatives are higher than for the LANL and the preferred alternative. Cost estimates (including uncertainties) will be an important factor in determining which alternative to pursue for the proposed project. This comment will be provided to the decision maker for this proposed project and will be given due consideration as the Department formulates its decision on the project. In making its decision, the Department will also consider factors such as the environmental impacts of the alternatives, national need for the medical isotopes, production schedules for each alternative, and other important factors.
- 5 The Advanced Test Reactor was evaluated for the proposed project and was dismissed for the reasons cited in Section 3.4.1.1. The Department is proposing to establish a backup to the existing Canadian supplier and does not believe that it is necessary to establish a backup to its backup.
- 6 If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. All the alternatives would have the capability of producing at least 100% of the current domestic demand for Mo-99, but the goal of the proposed project is to ensure that a reliable supply of Mo-99 is available to the U.S. medical community, not to produce Mo-99 for export and compete in the worldwide market for Mo-99.
- 7 The IBTC has not made a formal proposal to the Department regarding the dual use of the Power Burst Facility (PBF). Therefore, the Department cannot say for certain whether operation of PBF would be conducted privately (by IBTC) for the production of Mo-99 or by DOE.
- 8 It is possible that the Annular Core Research Reactor (ACRR) could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.
- 9 Comment noted.

BRADY'S

C.A. Brady II
Owner
1930 N. Woodruff Ave.
Idaho Falls, Idaho 83401

Telephone (208)622-6763
Fax (208)622-6767

January 17, 1996

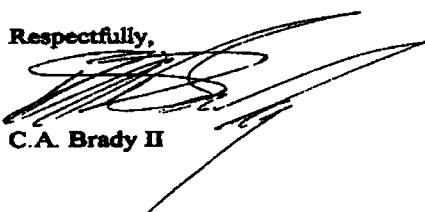
1 | I am here in support of locating the Production of Medical Isotopes and the Boron
Neutron Capture Therapy Project otherwise known as B.N.C.T. at the I.N.E.L.. These
programs optimize the peaceful use of the atom. They will save lives.

The PBF reactor is the most suited reactor for these projects both cost wise and
technically.

- 2 | 1. The PBF reactor is the only reactor using low-enrichment uranium fuel which reduces
waste generation and security requirements.
- 3 | 2. The PBF can dispose of the low level waste generated on site while the preferred
alternative would require packaging and shipping across state lines to the Nevada Test
Site.
- 4 | 3. One reactor suitable for both the isotope production and cancer treatment mission; The
technical ability to produce 100% of the nation's demand for these medical isotopes.
- 5 | 4. The initial expenditure is half the cost, and operation expense is at least one third lower
if done at the Power Burst Facility at the I.N.E.L.
- 6 | 5. Currently the PBF is the only choice which envisions the private sector taking over
production, a good way to demonstrate technology spin off and create jobs in Southeast
Idaho.

I urge you to look at all the pertinent criteria and you will see that PBF can do both
projects better than any other reactor. Local support is here. We want these projects here
in Idaho.

Respectfully,



C.A. Brady II

Responses to Comment Letter C013

1 Comment noted.

2 The Power Burst Facility (PBF) is the only option currently using low enriched uranium fuel. All the other options evaluated in detail have designs for converting to low enriched uranium. The objective is to not build any more highly enriched uranium fuel bundles for any of the other options, but to use the fuel already on hand until the supply is exhausted or, in the case of Annular Core Research Reactor (ACRR), until the burnup limit is reached—see Section 3.3.1.9. Two or three transition cores of both low enriched uranium and highly enriched uranium would be used during the conversion to all low enriched uranium fuel for these options. This is a long-term safeguards advantage, in that it depletes and irradiates the weapons grade material on hand.

It is not true that use of low enriched uranium fuel minimizes waste. More spent fuel bundles are generated per reactor full power year with the use of low enriched uranium bundles.

3 The INEL alternative and the LANL alternative both allow the small quantities of low-level waste generated by the Mo-99 process to be disposed of onsite. The commentor is correct in identifying that both the preferred alternative and the ORNL alternative would require some shipment of low-level waste to the Nevada Test Site (NTS). The NTS is preparing a site-wide environmental impact statement and has included waste generated from the Mo-99 mission in the quantities and description of materials to be stored on the site.

4 While the PBF has been the focus of the Idaho Brain Tumor Center's (IBTC's) efforts to conduct boron neutron capture therapy (BNCT), other reactors under consideration for the proposed project may also be suitable for the conduct of BNCT. If the Department decides to pursue this project, it would welcome a proposal from IBTC for dual use of the reactor facility selected for medical isotope production.

All of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99 and would also be capable, to varying degrees, of conducting synergistic activities.

5 The preparations costs for the INEL alternative, as shown in Section 5.22, are estimated to be about \$2.4 million (or about 12%) less than for the preferred alternative. The operations costs for the INEL alternative are estimated to be about \$4.4 million (or about 34%) less than for the preferred alternative. However, the uncertainties associated with the cost estimates for the INEL and ORNL alternatives are expected to be greater than for the LANL and the preferred alternatives.

6 The IBTC has proposed to privately conduct boron neutron capture therapy. Their desire or capability to also privately produce Mo-99 is not known, and they have not made a formal proposal to the Department regarding the dual use of the PBF. Therefore, the Department cannot say for certain whether operation of the PBF for Mo-99 production would be conducted privately (by IBTC) or by DOE.

Statement of Senator Kempthorne

January 17, 1996

1 I want to offer my enthusiastic support to the local effort to use the Power Burst Facility and the Idaho Brain Tumor Facility for the production of Molybdenum-99 (Molly-99). In my view, it makes great sense to couple the Boron Neutron Capture Therapy (BNCT) program with the production of important medical isotopes.

2 As the Department of Energy considers options for the
3 production of Molly-99, I want to be sure the unmatched facilities and professional capabilities in Eastern Idaho are appreciated by the department. To begin with, according to the technical experts I have consulted, the Power Burst Facility is the ideal reactor for the production of medical isotopes. At the same time, the PBF can be prepared for this mission in less time and at less cost than any other option being considered by the Department of Energy. In addition, the professional people and technical experts involved in the local effort and the INEL's historic role in reactor operations and nuclear materials management make Eastern Idaho the logical choice for this new mission.

4 As the role of the Department of Energy changes, new missions for DOE facilities are needed. Fortunately, in Eastern Idaho we already see private enterprise stepping in to fill some of the void. The Idaho Brain Tumor Center is an excellent example of this new private enterprise expansion and the production of Molly-99 in the PBF reactor would complement this effort.

I strongly support the effort of Dr. Paul and others to add the production of medical isotopes to the new mission for the PBF reactor. This mission makes sense for Idaho and the nation and I urge the Department of Energy to make the selection based on merit. If merit is the criteria for the selection, I am confident we will see Molly-99 production in Idaho in the near future.

Thank you, for your time.

Responses to Comment Letter C014

1 Comment noted.

2 The Power Burst Facility (PBF) offers many benefits. It is an open pool type reactor, which is advantageous and can run at relatively low power to conduct the Mo-99 mission. The other reactors considered are similar. PBF is a forced circulation reactor, and three of the others considered are also forced circulation, which helps to assure target cooling.

However, the PBF option requires significant reactor modification, as discussed in Section 3.3.4.9. Also, the targets must be irradiated in the central cavity similar to the Annular Core Research Reactor (ACRR), and neither experimental nor detailed calculation has been performed to assure that adequate target power could be achieved in PBF in this configuration. Two of the other options are very similar to the Cintichem reactor, and target power is relatively assured by both experiment and by calculation. One of the other options, ACRR, has had detailed calculations performed regarding target power, but actual experiments have not been performed.

Each of the reactors of the four alternatives possesses certain attributes and deficits. None are ideal, but all are capable of conducting the proposed project.

3 The Department recognizes that the estimated costs of preparation and operation of the INEL alternative, as shown in Section 5.22, are lower than that of the preferred and other alternatives. However, the Department also recognizes that the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred or LANL alternatives. The time required to ready the INEL facilities for full production is estimated to be second fastest and the same as the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in this EIS (including the cost and schedule data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

4 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

1

Statement of Senator Larry E. Craig
on the
Draft Environmental Impact Statement
for
Medical Isotopes Production Project:
Molybdenum-99 and Related Isotopes
Idaho Falls, Idaho
January 17, 1996

It is a pleasure to offer testimony today on the production of medical isotopes at the Department of Energy's (DOE) National Laboratories.

The involvement of the DOE in medical applications has been of particular interest to me. I have been an advocate of the use of the numerous reactors at the Idaho National Engineering Laboratory (INEL) for medical purposes for a number of years. However, what is at stake here is not just jobs for the working families of Idaho Falls.

1 | The INEL has already made contributions to medical research -- for instance using the Power Burst Facility (PBF) for Boron Neutron Capture Therapy, a breakthrough treatment for brain tumor patients with minimum patient trauma and cost. The production of medical isotopes, continuously needed in the United States, offers the INEL another opportunity to play an important medical role for the nation.

2 | Because of the INEL's critical nuclear expertise developed over 50 years, the INEL is the perfect and most logical location to produce these important medical isotopes many patients in our nation need. Our country would benefit significantly from this vital program.

The importance of assuring a dependable, reliable supply of Molybdenum-99 and its daughter product Technetium-99m for medical procedures cannot be overstated. Technetium-99m is used as a principal radiological diagnostic tool for 80 percent of the 36,000 diagnostic procedures performed every day, totalling 10 million procedures every year in the United States. These procedures help to identify medical conditions that would otherwise be identified only by invasive surgery. This isotope is clearly a vital tool in maintaining the health and well being of our citizens.

3 | At present, the United States has only one source of supply of Molybdenum-99 (Mo-99). That source is Nordion International, which produces it at the aging NRU reactor at Chalk River, Ontario. This reactor is just two years away from completing its 40-year design life. NRU not only supplies the entire United States market for Molybdenum-99, it supplies 85 percent of the entire world market. The future of medical isotope production from NRU is in serious jeopardy. This threat is so serious I understand a company has obtained a license to upgrade a 45 megawatt (MW) reactor in the

Netherlands -- clearly a result of the uncertainty about the Canadian supply. This country obviously needs a domestic supply of these important medical isotopes.

Although there may be other Canadian reactors coming on line in the future for medical isotope production, I feel it is vitally important that our Nation have the capability to produce medical isotopes on our own. We cannot afford to continue our current vulnerability. As noted in this draft environmental impact statement (DEIS), our goal is to meet initial domestic production of only 10 to 30 percent of the Nation's need, I believe we must move forward to assure we can produce 100 percent of our nation's medical isotope needs.

Today I will speak in support of the alternative discussed in the draft EIS that uses the facilities of the INEL. The PBF reactor at the INEL may offer multiple advantages in solving our Nation's medical isotope problems. For example:

1. The INEL offers the potential dual use of an existing reactor -- for medical isotope production and cancer therapy.
2. INEL offers unsurpassed expertise in reactor operations, existing reactors, and complete infrastructure support (hot cells and remote handling capabilities, expertise in handling and shipping spent nuclear fuels, among others) that can be adapted to the production of these isotopes. I am perplexed that the Advanced Test Reactor (ATR) is not considered in this DEIS. I suggest DOE consider ATR in their final EIS. I understand also that advances are being made in accelerator-based alternative technology research, and DOE may want to consider this alternative in the final EIS, as well.
3. INEL offers experienced, effective reactor operations management. However, in keeping with Congress' insistence that federal dollars are used as wisely as possible, the INEL management is actively evaluating the privatization of reactor facility operations to assure the effective use of tax dollars.

The Idaho Brain Tumor Center has offered to coordinate its reactor conversion plans for the PBF with the DOE, potentially saving millions of dollars.

Isotopes USA and the Idaho State University have offered private management and operation for the production of Mo-99.

One of the partners in the INEL management team,

3

Thermo Technology Ventures, is actively researching alternative technologies for isotope production.

4. INEL offers the lowest cost alternative for isotope production. We can simply not afford to pursue any alternative but the most cost effective means to meet isotope production needs.
5. The YFP reactor is the only alternative in the DEIS that uses low-enrichment uranium at the onset of operations, reducing the wastes generated and the security requirements inherent in using highly enriched uranium.
6. The INEL has already moved into the new management paradigm called for by the DOE, namely running the INEL like a business. The production of medical isotopes would be well suited to this new paradigm.

The new mission for INEL holds strong potential for developing not only national but international markets. I strongly encourage the Department to complete a final EIS on medical isotope production. I believe the DOE has moved far too quickly with far too little data in recommending a preferred alternative for isotope production. I strongly encourage DOE to take another look at the INEL and assemble detailed costs for a wide array of alternatives in the final EIS.

I believe our country would be well served if the INEL were the site for future medical isotopes production in United States. Such production is an important applied engineering project for the nation. Applied engineering is what INEL does and does well.

Thank you.

Responses to Comment Letter C015

- 1 The Department's decision on the proposed Medical Isotopes Production Project will be based not only on the environmental impacts of the alternatives, but also on factors such as cost and schedule, national need, and the potential for cost sharing with other initiatives.

It should be noted that the Power Burst Facility (PBF) is not currently operating (and has not operated since 1987) and thus is not currently conducting boron neutron capture therapy (BNCT). The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for BNCT and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

- 2 The INEL and the other alternative sites have the facilities and skilled personnel available to conduct the medical isotope production activities.
- 3 Comment noted.
- 4 If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. However, all of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99.
- 5 Comment noted.
- 6 Please see response to comment C015-1 above.
- 7 All of the alternative sites have significant nuclear facilities operations and waste management experience that can be adapted to the production of isotopes.
- 8 The Advanced Test Reactor is an alternative considered but dismissed in the EIS. The ATR option is discussed in Section 3.4.1.1.

Accelerators are considered but dismissed for the reasons discussed in Section 3.4.1.7. Future accelerator technology may be capable of supporting a Mo-99 mission (see Section 3.4.3.3). Current accelerator technology cannot support the objectives of the proposed project.

- 9 The Department will consider the potential for privatization of each of the medical isotope production alternatives as it formulates its decision on the proposed project.

The IBTC has informed DOE of its interest in coordinating its efforts with those of DOE; however, as stated above, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE.

The Department is aware of the efforts of Isotopes USA and Thermo Technology Ventures and has met with representatives of these organizations to discuss their interest in Mo-99 production. Their Mo-99 initiatives are discussed in Section 3.4.3.

- 10 The Department recognizes that the estimated costs of preparation and operation of the INEL alternative, as shown in Section 5.22, are lower than that of the preferred and other alternatives. However, uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred or LANL alternatives. Cost estimates (including uncertainties) will be one of the factors in determining which alternative to pursue for the proposed project.
- 11 The PBF is the only option currently using low enriched uranium fuel. All the other options evaluated in detail have designs for converting to low enriched uranium. The objective is not to build any more highly enriched uranium fuel bundles for any of the other options, but to use the fuel already on hand until the supply is exhausted or, in the case of the Annular Core Research Reactor, until the burnup limit is reached—see Section 3.3.1.9. Two or three transition cores of both low enriched uranium and highly enriched uranium would be used during the conversion to all low enriched uranium fuel for these options. This is a long-term safeguards advantage, in that it depletes and irradiates the weapons grade material on hand.

It is not true that use of low enriched uranium fuel minimizes waste. More spent fuel bundles are generated per reactor full power year with the use of low enriched uranium bundles.

- 12 The Department has used the best available information for all of its analyses and comparisons, including the cost information. Information on restart of the PBF was fairly thorough and was probably a result of the efforts to estimate costs and schedules for conversion of the PBF for BNCT. However, reactor conversion and operation is only a portion of the cost and schedule information requested. Hot cell modification, process line fabrication, target fabrication facility modification, and general processing operational costs also are reflected in Section 5.22 of the EIS. Additional information on the estimated cost of the INEL alternative was obtained subsequent to the publication of the Draft EIS and was used in the preparation of the Final EIS; however, the amount of supporting material associated with these estimates was less detailed than that received from some of the other sites. Thus the EIS contains statements that indicate the margin of error for both the INEL and ORNL estimates are considered larger than for LANL and SNL/NM.

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Congress of the United States
House of Representatives
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COMMERCE COMMITTEE
 SUBCOMMITTEE
 COMMERCE, TRADE, AND
 HAZARDOUS MATERIALS
 ENERGY AND POWER
 OVERSIGHT AND INVESTIGATIONS

AGRICULTURE COMMITTEE
 SUBCOMMITTEES
 RESOURCE CONSERVATION, RESEARCH,
 AND FORESTRY
 DEPARTMENT OPERATIONS, NUTRITION
 AND FOREIGN AGRICULTURE

STATEMENT FOR
 HEARING ON PRODUCTION OF MEDICAL ISOTOPES
 January 17, 1996

Cancer continues to be the second leading cause of death in the United States. Unfortunately, in spite of a national investment of \$23 billion during the past twenty years, cancer cure rates have not significantly improved.

Brain cancer is particularly difficult to treat. We are told that there is currently no viable treatment available within the United States for patients with the most severe form of brain tumor. Treatments such as surgery, radiation, and chemotherapy offer no real cure.

We must fund and develop revolutionary new procedures for treating cancer rather than maintaining our emphasis on improving currently available procedures. BNCT is one of these new treatments that offers promise and hope that one day soon, patients with now-fatal brain tumors can be cured.

In 1992, the Department of Energy designated the Idaho National Engineering Laboratory (INEL) as the "National Center for BNCT Measurement and Development". National Center research has demonstrated non-surgical, brain-tumor treatment feasibility. The Consortium was formed to assure that high-quality, non-surgical BNCT therapy is available to U.S. brain-tumor patients by 1996. This consortium approach reduces large overhead costs and provides a mechanism for using corporate and private charitable contributions as well as federal and state funding to conduct the necessary clinical trials.

The DOE and its predecessor agencies have produced and distributed medical and industrial isotopes through the Department's national laboratories for more than 40 years. In 1990, Congress consolidated all DOE isotope production activities under the Isotope Production and Distribution Program (IPDP). The program's primary responsibility is ensuring that the U.S. health care community has a reliable supply of Molybdenum-99 (Mo-99). Mo-99 decays rapidly into Technetium-99 (Tc-99), which is the most widely used radioactive medical isotope in the United States because of its broad medical applications.

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Page 2

1 | The INEL's Power Burst Facility (PBF) reactor has recently been
2 | listed as a potential site of the United States sole source of Mo-
3 | 99 isotope production. I believe the PBF facility demonstrates the
4 | most efficient, technologically compatible, and environmentally
5 | sound facility for production of the supply of Moly-99 for the U.S.
6 | medical industry and I suggest its designation as such.

7 | The U.S. currently has no domestic supply of the most widely used
8 | medical isotopes. The Idaho PBF reactor can supply 100 percent of
9 | the domestic demand for Mo-99 and still have excess production
10 | capacity for the exportation of Mo-99. Further, the PBF, the
11 | humanitarian aspects of the combined National Center for BNCT and
12 | the isotope production project makes the INEL's PBF the clear
13 | choice for the production of the nations supply of medical
14 | isotopes.

Thank you

U.S. Representative Michael D. Crapo

Responses to Comment Letter C016

- 1 Comment noted.
- 2 If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage. The goal of the proposed project is to ensure that a reliable supply of Mo-99 is available to the U.S. medical community, not to compete in the worldwide market for Mo-99. However, each alternative (after necessary modifications) would have the capability to produce 100% of the U.S. demand for Mo-99.
- 3 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.



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Governor Phil Batt

*Testimony prepared for delivery
at the*

*U.S. Department of Energy
Idaho Falls, Idaho*

hearing on the

**Medical Isotopes Production Project:
Molybdenum-99 and Related Isotopes
Draft Environmental Impact Statement**

January 17, 1995

To those gathered in Idaho Falls today, I regret that I cannot be there with you. I certainly extend my best wishes to you all.

1

Let me state my position clearly -- I fully support the effort to produce medical isotopes at the Idaho National Engineering Laboratory.

INEL has an available a reactor that is uniquely qualified to produce these important medical products -- the Power Burst Facility. I support bringing such production on line.

2

The Power Burst Facility can be started for significantly less cost than any other facility being considered in the Draft Environmental Impact Statement. For this reason and the others outlined in this testimony, PBF at INEL is clearly the facility the DOE should chose to begin the production of radioisotopes.

3

For far too long this nation has relied on Canada and, to a lesser extent, Europe, to supply the medical isotopes America needs. The time has come for this nation to take care of our own. I commend the Department of Energy for identifying this vital national need. I also commend the DOE for identifying INEL as a possible location for the production of these important products.

I am concerned, however, that the Draft Environmental Impact Statement indicates that the DOE is only looking for backup capability to provide 10 to 30% of the United States Molybdenum-99 (Mo-99) needs. In the final EIS, the DOE should revise the objective and raise the standard. The goal should be to provide 100% of American needs -- and maybe more.

The case for this position -- to provide for 100% of production needs -- is clearly made by the Draft EIS. The document plainly states that if the Canadian reactors were shut down, European sources could only provide "only a portion of U.S. demand." The statement also notes that until a backup production facility is brought on line which is capable of producing 100% of American needs, our nation is "vulnerable to an interruption in the supply of this important isotope." (Draft EIS Summary, page V.)

The case is clear. The United States needs to have the capability for full production of these important isotopes. PBF can fulfill that need.

As the DOE looks to meet the needs of our nation, the Department should also look beyond our nation's border. It is not enough to just satisfy the needs of American customers. The DOE should also begin searching out foreign markets for this important American product. Now is the time to begin.

Once again I commend the Department for identifying the need to produce medical isotopes in the United States. I certainly hope that the DOE will choose the Power Burst Facility at INEL for the production of these important materials.

Responses to Comment Letter C017

- 1 Comment noted.
- 2 The Department recognizes that the estimated costs of preparation and operation of the INEL alternative, as shown in Section 5.22, are lower than that of the preferred and other alternatives. However, the Department also recognizes that the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred or LANL alternatives. Cost estimates (including uncertainties) will be one of the factors in determining which alternative to pursue for the proposed project.
- 3 Comment noted.
- 4 All of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99. However, the goal of the proposed project is simply to ensure that a reliable supply of Mo-99 is available to the U.S. medical community, not to capture the U.S. market from the private Canadian firm (Nordion International) or to compete in the worldwide market for Mo-99.

If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage.



January 17, 1996

Attn: Department of Energy

From: Don Davis

RE: Production of Radioactive Isotopes at (Power Burst Facility) PBF
located at the INEL.

To whom it may concern:

I had a wonderful thing happen to me today. My cardiologist advised me that my heart had a abnormal beat. So, today I had the opportunity to have an stress test which used Technisiam to take a video of my heart which may improve my chances of staying around a while longer.

Two years ago I found out that we had the technology at BNCT to operate on and potentially save lifes of cancer patients with some types of Brain Tumors

One week ago, we discovered that a by product of an existing plant PBF was technisiam. I also found out the this country imports the majority of it supply. Additionally, I found out that PBF could supply 150% of this countries needs, in fact we could be exporting the stuff. I also understand that Sandia was given this project which will cost more and take longer to bring on line and their plant will not be as effective treating Brain Tumors.

This letter is to inform someone in Washington that for business reasons, community growth, new jobs that I am 110% for this technology here in Idaho Falls. What I can't understand for good sound business reasons why it wasn't chosen in the first place. Do poor decisions effect the budget?

Sincerely,

A handwritten signature in cursive script that reads "Don Davis".

Don Davis/Realtor

Voigt Davis Realtors

CC: Senators: Larry Craig
Dirk Kempthorn

Congressman: Mike Crapo
Helen Chenoweth

(208) 524-6000 • FAX (208) 529-0882 • 1908 Jennie Lee Drive • Idaho Falls, ID 83404

Responses to Comment Letter C018

- 1 If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage. The goal of the proposed project is to ensure that a reliable supply of Mo-99 is available to the U.S. medical community, not to compete in the worldwide market for Mo-99.
- 2 The Department has not made a decision regarding the proposed Medical Isotopes Production Project. A Record of Decision answering the Department's decision will be issued no sooner than 30 days after issuance of the Final EIS. The EIS process is being used to evaluate other alternatives for the production of Mo-99 and related medical isotopes. The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production. Please note also that use of facilities for treatment of brain tumors is not part of the proposed action and is not evaluated in this EIS.
- 3 Comment noted.

1/17/96

Thomas M Crawford
4905 Foxtrail
Idaho Falls ID 83402
(208) 522-7829

1 I am a physicist for the Idaho National
Engineering Laboratory, I as an INEL
employee would like to express my support
for ~~planning~~ choosing Idaho Falls as the
2 location of the Medical Isotopes Production
Project. We have the expertise and
many of the necessary facilities at the
INEL to support this facility.

I am also chairman of the Bonneville
County Republican Central Committee.
Our party organization also fully supports
bringing the Medical Isotope Production
Project to Idaho.

Responses to Comment Letter C019

- 1 Comment noted.
- 2 The INEL and the other alternative sites have the facilities, nuclear technology and expertise necessary to conduct the proposed project.

January 17, 1996

Wade P. Carroll

America needs a constant and consistent supply
of MOX 99, especially since the Canadian
source may well dry up when we start production.
The threat that the New Mexico reactor may be
taken over by the Defense Department should ~~be~~
disqualify that site.

G. Ross Darnell
339 East 49 South
Idaho Falls, ID 83404

Response to Comment Letter C020

- 1 The Annular Core Research Reactor (ACRR) is an Office of Defense Programs facility within the Department of Energy. If the ACRR is selected for the Mo-99 production project, its mission would be changed from defense testing to medical isotope production. It is possible that the ACRR could be diverted to support defense missions in case of a national emergency. However, the DOE has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.

11/17/96

1 We, the undersigned, support
the ~~the~~ moli-isotope production at
~~the~~ INEL, Idaho Falls, ID. Our
reasons are based on sound environ-
mental policy & strong community
support. In our opinion, the cost
savings & environmental safeguards
at INEL dictate that it is the
2 most logical and prudent of all
site selections

Kathi Sica - Alliance Title & Escrow Corp
Harry Göttinger - American Heritage, Realtor
Ed Adams - Madison Mountain Ranch Realty
Kathy

Responses to Comment Letter C021

- 1 Comment noted.
- 2 The Department recognizes that the estimated costs of preparation and operation of the INEL alternative, as shown in Section 5.22, are lower than that of the preferred and other alternatives. However, uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred and LANL alternatives. The potential environmental impacts of the four production alternatives analyzed in the EIS were found to be essentially the same for each alternative and, in all cases, were found to be low. Cost estimates (including uncertainties) and potential environmental impacts will be important factors in determining which alternative to pursue for the proposed project.

Steven A. Davies
364 8th Street
Idaho Falls, Idaho 83401

January 17, 1996

Mr. Wade Carroll
MIPP EIS Document Manager
Office of Nuclear Energy, Science and Technology (NE-70)
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874.

RE: PRODUCTION OF MEDICAL ISOTOPES AT THE INEL

Dear Mr. Carroll:

I have been a resident of Idaho Falls, Idaho for the last 6 years. I thoroughly enjoy the quality of life and pristine environment of this region, and have decided to remain in this area regardless of the future of the Idaho National Engineering Laboratory (INEL).

1 | I wish to express my **STRONG SUPPORT** for the Power Burst Facility (PBF) Reactor at the
2 | INEL to be the site chosen by the Department for the production of medical isotopes
3 | (molybdenum-99) in the United States. The economic impact on a smaller region like
Southeastern Idaho by such a program would be much more significant than to the other three
reasonable option sites under consideration. The citizens of this community have made major
contributions and many sacrifices in support of the cold war for this country, and are very excited
at the prospect of attracting new missions to the INEL.

Thank you in advance for your careful consideration of this issue. Should you have any questions or desire any follow-up discussion, please do not hesitate to contact me by mail, or by phone at (208) 529-9167.

Sincerely,

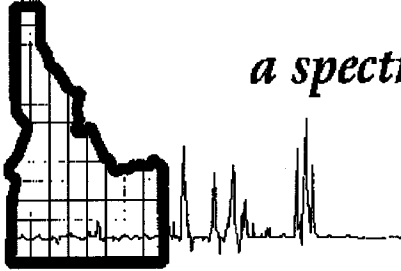

Steven A. Davies, P.E.

Responses to Comment Letter C022

- 1 Comment noted.
- 2 The Department realizes the importance of its laboratories to their respective state and local economies as well as the importance of preserving the valuable technical capabilities each of the laboratories possess. The socioeconomic impacts of the proposed project are presented in Section 5.3.
- 3 The Department recognizes and appreciates the contributions and sacrifices made during the Cold War by the citizens around the INEL and other DOE facilities.

IDAHO ACADEMY OF SCIENCE

a spectrum of disciplines



909 Lucille Ave.
Pocatello, ID 83201
January 17, 1996

Mr. Wade Carroll
MIPP EIS Document Manager
Office of Nuclear Energy
Science and Technology (NE-70)
U.S. Dept. of Energy
19901 Germantown Road
Germantown, MD 20874

Dear Mr. Carroll:

1 | This is to express **support** for using the Power Burst Facility (PBF) at the Idaho National Engineering Laboratory (INEL) to produce medical isotopes. The use of this already existing facility would be practical and would receive broad-based public support in this region.

2 | Southeast Idaho already has a strong technical community associated with the INEL. Because many of these people have worked with and understand nuclear technology, this area is largely free from the superstitious fear of everything nuclear that prevails in many regions of this country.

Please select the PBF at the INEL to provide a secure *domestic* source of radioisotopes, in this case, largely for medical purposes.

Sincerely,

Philip A. Anderson,
Executive Secretary
(208) 526-3395, daytime
(208) 234-7001, evenings

Responses to Comment Letter C023

- 1 Comment noted.
- 2 The Department recognizes and appreciates that the INEL and each of the other alternative sites have strong technical communities.

Steven K. Zohner
1042 Grizzly Ave.
Idaho Falls, ID 83402
Ph. 208-524-4176
Work Ph 208-526-3669
January 10, 1996

Mr. Wade Carroll
EIS Project Manager
Office of Nuclear Energy, Science and Technology (NE-70)
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874-1290

Subject: Comments on DOE'S draft medical isotope production project:
molybdenum-99 and related isotopes environmental impact statement
(DOE/EIS-0249D) - SKZ-01-96

Dear Mr. Carroll:

Thank you for sending me a copy of the draft EIS for the medical isotope project. I appreciate the opportunity to comment on this project.

The medical isotope project is indeed necessary. The case made by DOE to establish a dependable source for medical isotopes is well made in the draft EIS. There is uncertainty concerning the direction that Canada will take. At present, DOE must begin establishing a reliable source of medical isotopes regardless of what Canada decides to do in the future.

I have taken the time to read through the complete draft EIS. However, I am going to limit the majority of my comments to the preferred site and the INEL option. I have tried to provide you with the reference page for each of my comments. By doing this it will help you locate and identify the wording in the draft EIS that I am discussing.

Acronyms and Abbreviations page xxxiii,

The following acronyms were not listed but were used in the report.

Include becquerel (Bq) The SI unit for radioactivity.

Include electron volt (eV)

Include gray (Gy) The SI unit for absorbed dose

Include kelvin (K) The SI unit for temperature

Include rad

Include rem

Include roentgen (R)

Include volt (V)

Change ^3H to H-3 to be consistent with the rest of the document.

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Mr. Wade Carroll
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Page 2

Why are only GeV and MeV included when eV is not listed? For consistency remove GeV and MeV and define eV, the SI prefixes should be listed in a table but each unit in the abbreviation section should not be listed as a separate unit. For example, curie should be listed but mCi, μ Ci, nCi, pCi, fCi, aCi, zCi and yCi need not be listed separately. However, a table defining these prefixes should be provided.

Why are only mCi and pCi listed? Again, only the base unit should be in the abbreviation section with the prefixes listed in a separate table.

Units of Measure page xxxviii

Include the SI unit for temperature which is the kelvin (K).
Include the SI unit for time which is the second (s).
Include the SI unit for rate which is meters per second (m/s)
Include the SI unit for area which is the square meter (m²)
Include the SI unit for mass which is the kilogram (kg).

Again, once a base unit has been defined, it is not necessary to list all the metric units that can be made by adding SI prefixes. Thus, under length, mm and μ m should not be included because the base unit (m) is already listed.

Nomenclature page xxxix

Throughout this report SI prefixes are used. A complete list of these prefixes would help the reader identify all units made by adding one of these prefixes.

SI Prefixes

Factor	Prefix	Symbol	Factor	Prefix	Symbol
10^{24}	yotta	Y	10^{-1}	deci	d
10^{21}	zetta	Z	10^{-2}	centi	c
10^{18}	exa	E	10^{-3}	milli	m
10^{16}	peta	P	10^{-6}	micro	μ
10^{12}	tera	T	10^{-9}	nano	n
10^9	giga	G	10^{-12}	pico	p
10^6	mega	M	10^{-15}	femto	f
10^3	kilo	k	10^{-18}	atto	a
10^2	hecto	h	10^{-21}	zepto	z
10^1	deka	da	10^{-24}	yocto	y

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example: The base unit curie (Ci) may be changed by adding a SI prefix.

1 Ci	=			3.7×10^{10}	Bq
1 mCi	=	1×10^{-3}	Ci	=	3.7×10^7 Bq
1 μ Ci	=	1×10^{-6}	Ci	=	3.7×10^4 Bq
1 nCi	=	1×10^{-9}	Ci	=	3.7×10^1 Bq
1 pCi	=	1×10^{-12}	Ci	=	3.7×10^{-2} Bq
1 fCi	=	1×10^{-15}	Ci	=	3.7×10^{-5} Bq
1 aCi	=	1×10^{-18}	Ci	=	3.7×10^{-8} Bq
1 zCi	=	1×10^{-21}	Ci	=	3.7×10^{-11} Bq
1 yCi	=	1×10^{-24}	Ci	=	3.7×10^{-14} Bq

Going through the same listing for all possible units (R, rem, m, eV, etc.) is unnecessary once the base unit has been defined.

Units of Radioactivity page xxxix

"fCi" was skipped in this list. It is not necessary to list all the units that can be made by adding a prefix to the curie. However, if all the units that may be made by adding a prefix are listed, then all SI prefixes should be used.

Units of Radiation Dose page xxxix

The base unit rad should be listed

The base unit rem should be listed

The base unit gray (Gy) should be listed. This is an SI unit

1 Gy = 100 rad

Once the base unit is given, other units that can be made by adding SI prefixes are not necessary.

Numerical (Scientific or Exponential) Notation. page xxxix

"aCi" is listed above in the "Units of Radioactivity" but the unit

"atto" is excluded from this list. All of the prefixes used

should be defined. This would be accomplished if the SI prefix table is included.

Conversion Table page xli

The listed conversion from nCi to pCi is wrong.

To convert nCi to pCi multiply nCi by 1000.

The listed conversion from pCi to nCi is wrong.

To convert pCi to nCi multiply pCi by 0.001.

1 nCi = 1×10^{-9} Ci = 1000 pCi

1 pCi = 1×10^{-12} Ci = 1/1000 nCi

Conversion Table page xli

There are 4 different definitions of an ounce. If ounces are used, they should be identified as (a) the avoirdupois ounce (28.35 grams), (b) the

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8 | apothecaries ounce (31.1 grams), (c) the U.S. fluid ounce (29.57 ml) or
 (d) the British Imperial ounce (28.41 ml). The U.S. dry ounce is the
 avoirdupois ounce.

9 | Radionuclide nomenclature p xliii

 The half live of Ce-141 is 32.5 days. This is significantly different
 from the 35.5 days listed.

 The remaining half lives are not significantly different to warrant
 changes.

10 | 10. Radionuclide nomenclature p xliii

 Footnote (b) identifies "m" as isomers. This is true but the
 abbreviation m stands for the "metastable" state of the nuclide.
 Metastable is defined in the Glossary of terms (p 7.1) but isomer is not
 included in this glossary. For these reasons, footnote (b) should be
 changed to "Metastable nuclides (isomers) are indicated by the addition
 of an m."

11 | 11. Security Requirements (general comment)

 Unirradiated U-235 creates significant security requirements. The draft
 EIS does not address the security required, what the current security is
 at each site, and what has to be done to upgrade the security of each
 proposed site. Facilities at the INEL using or storing purified U-235
 are kept under strict security. The INEL has a long history of working
 with and protecting the unirradiated U-235. Currently, the INEL has in
 place adequate security procedures and trained personnel to meet DOE's
 security requirements.

12 | 12. "The Power Burst Facility could be used to produce Mo-99 and
 concurrently as a Boron Neutron Capture Therapy treatment center. This
 approach could incorporate privatization of Mo-99 production early in
 the process." p 3.48 The privatization option translates into reduced
 costs and less money being taken out of the publics purses. Having a
 facility that has the best potential for privatization is am important
 consideration which seems to carry little weight in the EIS.

13 | 13. "Adequate wet and dry spent fuel storage exists on site." This is
 referring to the INEL option. p 3.50 This simple declaration is
 extremely important. Spent nuclear fuel shipments are being stopped,
 banned, tied up in courts by law suites or prohibited from being
 transferred into states that did not generate the spent fuel. States do
 not want to be a dumping ground for other states waste, especially if it
 is nuclear waste. Therefore, being able to handle the spent nuclear
 fuel at the location it is generated is not only nice, it should be a
 requirement for this project.

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14. "Mo-99 production feasibility studies addressed the possibility of conducting all processes in stand alone cells purchased from a viable supplier. Such an arrangement would be of great financial advantage, if these cells could be located in an existing facility close to the Power Burst Facility and possibly even be considered a single facility with the Power Burst Facility" p 3.51 This potential arrangement has significant advantages that the other options lack. Reducing the cost to the taxpayer should carry more weight than this EIS is placing on it.
15. "However, it may be feasible to erect an additional annex to the Power Burst Facility structure, shielded from the main reactor building, and connected to existing Power Burst Facility effluent ventilation and radiation monitoring systems. Such a facility would provide great advantage to the use of stand-alone manufactured cells and eliminate transportation time and liability." p 3.51 Reducing radiation doses to workers and the public should be critical in deciding a preferred site. The advantage of this INEL option does reduce DOE's liability due to harm caused by radiation or transportation accidents.
16. Table 3-1, page 3.64 shows the dose to the population within 80 km of the INEL project would be over 10 times lower than DOE's preferred site in New Mexico. In selecting the preferred site why is such little weight placed on the dose to the people around the site? DOE has an option at the INEL which reduces the risk to the population around the production site. This option, from an ALARA standpoint, is a better choice for those living around the facility.
17. Table 3-1, page 3.65 again shows the radiological dose to transportation crews and to the public is lower at the INEL than DOE's preferred site. This seems to violate the whole ALARA concept. Why would DOE choose a site which gives workers and the public higher doses of radiation? I believe that more weight should be given in reducing DOE's liability in the areas of transportation and radiation.
18. Table 3-1, page 3.66 target processing at the INEL is shown to be 10 times less likely to have an accident per year than any other option. Other types of accidents are about the same for each site. This 10 fold reduction at the INEL is impressive in preventing potential harm. It appears that accident prevention has been underrated in selecting the preferred site.
19. Table 3-1, page 3.66 shows that the dose to the maximally exposed individual near the INEL would receive nearly 10 times less dose than the maximally exposed individual at DOE's preferred site from an accident during target processing. Dose to the public is a major concern for these people and in obtaining state permits. This much

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- 19 | potential reduction in harm should be an important factor in deciding a preferred site.
20. | Table 3-1, page 3.66 shows that the dose to the population within 80 km of the INEL due to a target processing accident is 10 times lower than DOE's preferred site. ALARA concepts should be implemented when selecting a site. DOE has the opportunity to decrease the potential harm to the public by 10 fold. The public's welfare should not be underestimated. This approach has been an ugly legacy in DOE's nuclear history. Safety, both to the workers and to the public must be consistently guarded to win back the public's confidence.
21. | Table 3-1, page 3.68 shows that the INEL site will be \$ 2,000,000 less expensive to construct than DOE's preferred site. More importantly, the yearly operating costs at the INEL will be nearly \$ 4,000,000 less than DOE's preferred site. This 4 million dollar a year savings is extremely important, especially when the life time of the operation is considered. In these times of reduced government budgets considerable weight must be given to a operation that will provide an acceptable produce at a savings of 4 million dollars a year.
22. | Table 3-2, page 3.69 shows that the current status of the INEL is in standby mode while DOE's preferred site is operational. This is a mute point since it has already been shown that to bring the INEL operation up will cost the public 2 million dollars less than the preferred site.
23. | Table 3-2, page 3.69 shows that the hot "cells at the INEL are adequate but would require minor modifications." while DOE's preferred site would require "New hot cells required for full production." Throwing money at a problem has been the nuclear industries way of solving problems. The public is much less tolerant of such expenditures when DOE has an existing facility that may be used without modifications.
24. | Table 3-2, page 3.70 shows that the schedule from the record of decision to full operation is the same for the INEL and DOE's preferred site. This point is important. Full production is the end goal. DOE's preferred site can be partially operational in less time than the INEL but partial operation should not be a determining factor when the life of the facility is concerned.
25. | Table 3-2, page 3.70 shows that the INEL option has significant waste management advantages over DOE's preferred site. These advantages are "Cradle to grave waste management. No shipping, all waste disposed at INEL facilities. Liquid low level waste treated and stored on site." DOE's preferred site does not have cradle to grave waste management. It was not mentioned that the INEL has been designated by DOE as the lead lab in waste treatment technology. INEL currently has cradle to grave

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waste capabilities and waste treatment technology will increase at the INEL in the years to come.

26. Table 3-2, page 3.70 shows that the INEL has 35 years of isotope production experience. DOE's preferred site has no isotope production experience. In determining the preferred site, a history of isotope production experience should be a major consideration. It illustrates that the site has a proven record, has the facilities, has the technological experience and an experienced work force. In Appendix A page A.1 the INEL is shown to have personnel who have performed the chemical separation for the medical isotopes. This experience and knowledge is lacking at DOE's preferred site according to this EIS.
27. Table 3-2, page 3.70 states that at the INEL "PBF lease agreement in place Idaho Brain Tumor Center for Boron Neutron Capture Therapy. Idaho Brain Tumor Center interested in shared cost venture." This indicates that the INEL site has aligned itself with the concept of return on investment. The INEL site leads the other options in reducing the cost to the tax payers through shared costs and privatization. The preferred option lacks shared costs and has a very low probability of privatization.
28. The air quality near the preferred site is listed as nonattainment by the U.S. EPA for carbon monoxide. Carbon monoxide will increase at this preferred site due to transportation of targets, waste handling etc. The INEL site air quality has no nonattainment listings. Placing a facility in a nonattainment area knowing that the operation of the facility will contribute more carbon monoxide to an area that is already listed as nonattainment is hard to justify. The INEL option does not carry such a negative impact, reduces DOE's environmental liability while allowing for more operational flexibility from state and federal air regulations. p 4.11
29. "Neither INEL nor any of the surrounding counties is designated as a nonattainment area (40 CFR 81.313) for the National Ambient Air Quality Standards (40 CFR 50). Ambient air quality data monitored in the vicinity of INEL indicate the site is in compliance with applicable air quality standards." Locating the facility at the INEL would not risk the health of workers or the public. Locating the facility at DOE's preferred site knowing that this area is not in compliance with air quality standards is very hard to justify. p 4.83
30. Table 4-21, page 4.84. The numbers are small enough that they need not be expressed in scientific notation.

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- 30 31. Table 4-22, page 4.84. It would be less confusing if the unit of measure is change to pCi/m^3 . As is, it is confusing to the general public if the Ci/m^3 has been multiplies by 10^{-12} or if it needs to be multiplied by 10^{-12} .
32. Table 4-23, page 4.84. Again it is suggested that the unit of measure be change to pCi/m^3 , thus eliminating possible confusion about whether the listed value needs to be multiplied value by 10^{-12} or if it has already been multiplied by 10^{-12} .
- 31 33. "The planned facility modifications at SNL/NM are the most extensive required at any site." p 5.2. Why is this DOE's preferred site when other sites require less facility modifications and will operate at lower yearly costs?
- 32 34. Table 5-1, page 5.4 show that the INEL option is less expensive than DOE's preferred site. The total facility costs for 1996 through 1999 for DOE's preferred site is 47.1 million dollars and labor costs for this same time period is 226 million dollars. The facility costs for the INEL option is 14 million dollar less (33.6 million) for facility costs and 11 million less (215 million) for labor costs. The total savings of the INEL option over DOE's preferred site is 25 million dollars. From a cost perspective, DOE's preferred site cannot be justified, especially to the tax payers who will foot the bill.
- 33 35. Table 5-3, page 5.8 and Table 5-8, page 5.13. The dose to off site resident at the preferred site are 10 times higher than for the INEL option. The dose to on site workers are 10 times higher for the preferred site than for the INEL option. The off site population dose is 2 times higher than the INEL option. The off site population dose from hot cell operation at the preferred site is 10 times higher than the INEL option. How can DOE justify this increased dose associated with the preferred site when the INEL option has significantly lower radiological impacts? The public has the perspective that DOE does as they please and concerns of the citizens come second. I am concerned that this type of dose discrepancy listed add fuel to this perspective.
- 34 36. Waste disposal page 5.34. "Low level radioactive waste would be shipped from SNL/NM to the Nevada Test Site for disposal." The time frame for the Nevada Test Site to accept waste is yet unknown. Yes, there is a time frame on paper but the reality is that this paper date continues to move farther and father into the future. Both the governor and people of Nevada do not want the waste in Nevada and are actively pursuing steps to stop such shipments. Accepting this approach to as the preferred waste disposal is banking on the unknown. It is not prudent

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to depend on a waste disposal system that is not functioning or which is at least near completion.

37. Waste disposal page 5.38 at the INEL option. "In this alternative, all three steps (fabrication, irradiation, and processing) would be carried out on site at INEL." "INEL is a cradle to grave waste management operation.." INEL has been safely managing spent nuclear fuel for over 40 years." The waste disposal at the INEL site is in place and has a proven track record. There are no uncertainties with the ability of the INEL to handle the waste. The preferred site bases its waste disposal on a system that is not operating, has no history of success and is being fought by state governments and local people. It seems extremely optimistic to place waste disposal in such an uncertain position when the INEL option shows clear advantages.

38. Table 5-52 page 5.100. This table shows that the INEL option has the lowest preparation cost of any of the other alternatives. In addition, the INEL option has the lowest yearly operating cost of any of the other options. The cost savings of the INEL option are not insignificant. The INEL would save the tax payers nearly 4 million dollars a year over DOE's preferred site. From the public's perspective, DOE may as well dig a hole and every year bury 4 million dollars. From a business perspective, a company would fire the executive who chooses to pay 4 million dollars more a year over an identical product from another supplier.

39. DOE's preferred option will result in having to ship the spent fuel to the INEL. Currently, the state of Idaho has shown an unwillingness to accept waste generated from out of state sites. There is no reason to assume that the state will change to willingly accept waste generated in New Mexico at DOE's preferred site. However, if the spent fuel has been generated in the state of Idaho, there has been no resistance to storing or treating it at the INEL. page 6.7

40. "Of the sites under consideration in this EIS, the only site that is located in an area that has nonattainment status for a criteria pollutant is SNL/NM, which is in an area that is nonattainment for carbon monoxide." page 6.8 It seems only prudent that the facility built by DOE should to produce medical isotopes should only be considered in areas where air quality meets attainment status. Placing this facility in DOE's preferred site will only result in additional carbon monoxide generation due to transportation needs at this site.

41. The governor of Idaho, Phil Batt and Tom Grumbly, DOE assistant secretary for environmental management signed an agreement in October 1995 that allows spent nuclear fuel shipments to the INEL. However,

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spent nuclear fuel shipments to the INEL will be linked to transuranic waste shipments out of Idaho. The pact prohibits any shipments of spent fuel to Idaho after April 30, 1999, until shipments of transuranic waste from the INEL to the Waste Isolation Pilot Project in New Mexico or another facility are proceeding at a specified rate. DOE's preferred site cannot expect to send its spent fuel to INEL for storage as suggested in the EIS. These shipments will be prohibited after April 1999 unless the INEL can send its transuranic waste to a repository outside of Idaho.

The INEL option for the production of medical isotopes has the ability to store the spent fuel at the INEL. The state of Idaho has only objected to bringing spent fuel into Idaho from out of state generators. Throughout the U.S. spent nuclear fuel is accumulating. Currently, each generator of spent nuclear fuel is required to store the fuel on site until DOE has a suitable repository. The deadline for this repository has repeatedly been put farther into the future. Idaho has stopped out of state shipments of spent nuclear fuel into Idaho. Nevada has also successfully stopped the development of a waste repository within its borders.

Knowing the current political climate, the INEL option has the best waste management ability of any of the proposed sites. All of the waste associated with the medical isotope project could be handled at the INEL.

The U.S. needs a reliable source of medical isotopes. The options discussed in the EIS were all interesting. However, I am concerned that too many assumptions were made concerning radioactive waste storage and the handling of spent nuclear fuel. I feel that it is wrong to assume that the Nevada Test Site will be operational as specified. I also feel that the assumption that the preferred site can send its spent fuel to Idaho for storage at the INEL is wrong. Evidence indicates that the ability of a site to handle all of the waste generated in the production of medical isotopes will be essential for its operation and the only option presented that can do this is the INEL in Idaho.

Sincerely,

Steven K. Zohner

Steven K Zohner

Responses to Comment Letter C024

- 1 The Department used the acronyms and abbreviations that were believed to be helpful to the domestic public. Also, those units believed to be more commonly known to and used by the public, such as curie in lieu of becquerel were used in the EIS. Temperatures were generally provided in terms of Fahrenheit, which is more commonly understood and used than Kelvin.

Certain of the terms the commentor suggested be included in the list of acronyms were defined in the glossary, such as rem. A search of the document did not uncover the use of the term "gray" in the body of the document. However, gray was mentioned in the dose discussion of the glossary.

- 2 A mix of SI and English units has been used in the document. SI units which were perceived as common, such as meter, centimeter, kilogram, were used. The Department supports the use of SI units, but has used English units if those terms were believed to be more easily understood by the general public. A conversion table of English/SI units is provided in the Units of Measure section of the EIS (Volume I).
- 3 A mix of SI and English units has been used in the document. SI units which were perceived as common, such as meter, centimeter, kilogram, were used.
- 4 SI prefixes which were perceived as common, such as centi, milli, kilo, mega were used. A complete list specifying prefixes not used in the text (such as "fCi") is considered inappropriate.
- 5 The units of rad and rem are discussed in the glossary. Gray is mentioned in the glossary, but was not used in the body of the document because it is not a commonly used unit.
- 6 The definition of the prefix "atto" has been added to the numerical notation section.
- 7 The table has been changed to reflect this comment.
- 8 The Department used the avoirdupois ounce.
- 9 The radioactive half-life of cerium-141 was corrected.
- 10 Isomeric states tends to be a more commonly used term than metastable states. Further, isomer is the appropriate definition as the abbreviation "m" is used in this document. The isotope of interest is an isotope of a different quantum energy eigenstate that usually, but not always, decays to the lower state of the same isotope. Isomer has been added to the glossary, but the footnote has not been changed.
- 11 No physical security program upgrades are required on any of the sites. All sites have long and well-established existing programs that address the physical security requirements for handling strategic quantities of special nuclear materials. Certain of the sites have handled nuclear weapons, a physical security program far beyond that required for the unirradiated targets. However, any site, including INEL, if selected, would need to establish the appropriate storage materials balance areas, complete with security requirements, for the storage of unirradiated targets near the reactor facility. This is described in general terms for the SNL/NM option in Section 3.3.1.3. Requirements at all other sites would be similar.

Physical security requirements for materials are delineated in 10 CFR 73. All facilities, federal or commercial, are subject to those requirements. On all sites, security requirements for special nuclear materials are part of the special nuclear materials control program. This is generic throughout the DOE complex. Handling and storage of unirradiated targets is specified to be under the special nuclear materials control program at each site.

- 12 The purpose of the EIS is to analyze the environmental impacts of alternative means of accomplishing the proposed action. Although the potential for privatization is important, the privatization process is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including this proposed Medical Isotopes Production Project. If the Department decides to implement the action proposed in this EIS and promising concepts are received from the private sector, the Department would seek privatization proposals on a competitive basis.
- 13 All alternatives considered have sufficient onsite spent nuclear fuel (SNF) storage capabilities to operate at 100% U.S. demand for at least 5 years. Long-term disposition of SNF will be in accordance with the Record of Decision for the Spent Nuclear Fuel Programmatic Environmental Impact Statement (SNF PEIS) (DOE 1995b) (see Section 5.14).
- 14 The option of having a hot cell built or moved to the Power Burst Facility (PBF) site has been studied by DOE and discussed with the Idaho site. This would obviate the need for shipping irradiated targets from the PBF to the hot cell, but would have a significant impact on the cost and the schedule.

Similarly, moving a hot cell is impractical. The lead glass windows and manipulators can be scavenged from other cells, if they are adequate, and installed in cells built to be co-resident with the PBF. Three targets irradiated at a target fission power level of 20 kW contain 99,600 curies of activity after an 8-hour cooling time. Few manipulators or windows in hot cell facilities are designed to accommodate this level of activity. A building would also be required. The ventilation system must be designed such that airborne fission products are captured and not released to the atmosphere.

A detailed estimate to build a new hot cell at SNL/NM totals well over the \$4.8 million indicated in the EIS for INEL hot cell preparation. The SNL/NM estimate is based on building the cell in an existing building and obtaining manipulators and windows for the cost of shipping only. Several million dollars would need to be added to the Idaho cost estimate if a new hot cell facility were to be added. Also, despite being a parallel path activity, the schedule would most likely be adversely impacted, and a 2-year schedule would probably not be achievable. The building and the cells would need to be completed early (probably within a year) to be capable of establishing the chemical process stations and waste management facilities required for the Mo-99 mission.

- 15 If the Department proceeds with a production alternative, it will attempt to minimize the impacts from the Mo-99 project for whichever alternative is selected.
- 16 The lower population within 50 miles of INEL and the remote location of the proposed isotope production facilities result in a smaller collective dose from facility air emissions at that site compared to the preferred alternative at SNL/NM. However, the major component of radiological risk to the public from the isotope production project results from transportation, for which the risks are very similar in both alternatives. The

risk of latent fatal cancer in the offsite population as a result of normal facility operation or accidents is much lower than 1 for both alternatives, such that no health consequences would be expected for any reasonable duration of the project.

The results in Table 3-1, and the corresponding results reported in Section 5 of the EIS, indicate that the doses to the most exposed individual offsite resident and onsite worker from facility operation are similar or higher for the INEL alternative compared to the preferred alternative at SNL/NM. However, the dose to the maximally exposed offsite individual for either alternative is less than 2% of the EPA standard for radionuclide air emissions at DOE facilities (10 mrem/year). If the Department proceeds with the action proposed in this EIS, the ALARA (as low as reasonably achievable) program would be implemented at the selected site in order to limit doses to workers and the public.

- 17 The commentor observes that the dose to the public and transport crews is lower for the INEL alternative than for the preferred alternative at SNL/NM. However, the radiation dose to the public and crew from transportation of radioactive materials differs by less than 10% at any of the alternative sites other than Oak Ridge. The lowest transportation dose to the public is associated with the Oak Ridge alternative. This is due to its proximity to the radiopharmaceutical companies that would receive medical isotopes from DOE.

If the Department proceeds with the action proposed in this EIS, the ALARA program would be implemented at the selected site to reduce the cumulative radiological impacts of all aspects of the Medical Isotopes Production Project.

- 18 Two types of target processing accidents were evaluated at all sites: one for processing Mo-99 targets and one for processing iodine-125 targets. Both accidents were evaluated at INEL (see Table 5-44 and Table 5-45); however, only the accident resulting in the highest potential offsite consequences was reported in the summary (Table 3-1). At the INEL, the iodine-125 target processing accident would result in the highest potential offsite consequences. For the other alternatives, the Mo-99 target processing accident was reported in the summary because the potential consequences were greater than for the iodine-125 target processing accident at those sites.

The expected frequency of the Mo-99 target processing accident was assumed to be 1.0/year at all sites because the nature and scope of the process would be similar under all alternatives. The expected frequency of the iodine-125 target processing accident is lower at all sites (0.1/year) because fewer targets of this type would be processed under any alternative. In all cases, the risk of latent fatal cancer from accidents during target processing is much lower than 1, and the differences in risk between the alternatives are not likely to be a major consideration in siting the project.

- 19 Please see response to comment C024-18 above.
- 20 If the Department proceeds with the action proposed in this EIS, the Department would implement the ALARA program at the selected site to reduce the radiological impacts from the Mo-99 project. Comparative doses will be considered for the Record of Decision.
- 21 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed

action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

- 22 The difference between an operational reactor and a reactor in standby mode is significant because of the steps required to restart a non-operational reactor. Before a non-operational reactor can be restarted, the condition of the facility must be verified, systems must often be repaired, safety documentation must be updated, operators must be trained, operating procedures must be written or updated. Planning documents must be written to guide these activities, and the activities cannot commence before the planning documents are approved.

For an operational reactor, these activities are conducted routinely, and the planning documents are largely in place. The fact that most or all of these activities are ongoing at an operational reactor means that there is less uncertainty associated with the use of an operational reactor than with the use of a reactor that must be restarted. Since the Department is proposing to respond to a near term "window of vulnerability" in the supply of Mo-99, the uncertainties associated with each of the alternatives (especially schedule uncertainties) will be an important factor in the decision-making process.

- 23 The hot cells for processing the medical isotopes at each of the alternative sites would require modifications, with those at the preferred alternative being the most significant. At the preferred alternative, a new bay of hot cells would be constructed inside the existing Hot Cell Facility (HCF) building, which is adjacent to the Annular Core Research Reactor (ACRR).

Since the ACRR (the preferred reactor) is operational, the estimated cost of preparing this facility for medical isotope production is significantly lower than the other alternatives. Thus, the total cost of this alternative is comparable to others.

- 24 "Partial operation" of the facility is important in that, if a Mo-99 shortage were to occur in the near future, the Department would be able to supply at least a fraction of the U.S. demand. The Department has proposed the Medical Isotopes Production Project to respond to a near term "window of vulnerability" in the Mo-99 supply situation; therefore, the ability to produce even a small amount of Mo-99 in a short period of time is an important factor and will be considered in the Department's decision on the proposed project.
- 25 Two of the four alternatives analyzed in detail in the EIS do not have the capability of "cradle to grave" waste management. The Department does not believe this impacts the viability of any of the alternatives. As discussed in Section 5.14 of the EIS, the quantities of waste generated from production of Mo-99 are small and would be handled in accordance with each sites' established waste management programs with few additional impacts.
- 26 The Department recognizes that all of the alternative sites except SNL/NM have significant experience in the production of isotopes.
- 27 Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to

implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis.

- 28 The nonattainment status for carbon monoxide in the Albuquerque area would not affect the ability to site or operate the Medical Isotopes Production Project at SNL/NM. The isotope production mission would not result in a measurable increase in emissions of criteria pollutants and therefore would not contribute to degradation of air quality in the region.
- 29 Please see response to C024-28 above.
- 30 The approach used is standard.
- 31 The ACRR/HCF combination at SNL/NM is the preferred alternative for reasons stated in Section 3.3.1.1.
- 32 The ACRR is the Department's preferred option for the reasons stated in Section 3.3.1.1. The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.
- 33 Although the doses for the offsite resident (maximally exposed individual) are smaller for INEL than other alternatives such as the SNL/NM alternative, the projected dose for any of the alternatives is a very small fraction of the regulatory limit.
- 34 The Nevada Test Site (NTS) is preparing a site-wide environmental impact statement and has included waste that would be generated from the Medical Isotopes Production Project in the quantities and description of materials to be stored on the site. The Department believes that any uncertainty surrounding the NTS's ability to accept the waste from the proposed project is sufficiently small that there will not be an impact on the proposed project.
- 35 The quantity of waste that would be generated by the proposed project at any of the alternatives is small. The disposal of the low-level waste would take place at NTS for the preferred alternative and for the ORNL alternative. The LANL and INEL alternatives would dispose of the low-level waste onsite in existing DOE approved facilities. All the alternatives have on-going laboratorywide waste management and minimization programs.
- Two of the four alternatives analyzed in detail in the EIS do not have the capability of "cradle to grave" waste management. The Department does not believe this impacts the viability of any of the alternatives. As discussed in Section 5.14 of the EIS, the quantities of waste generated from production of Mo-99 are small and thus would be handled in accordance with each site's established waste management program with few additional impacts.
- 36 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed

action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

- 37 All alternatives considered have sufficient onsite SNF storage capabilities to operate at 100% U.S. demand for at least 5 years. Long-term disposition of SNF will be in accordance with the Department's Record of Decision for the SNF PEIS.
- 38 Please see response to C024-28 above.
- 39 Please see response to C024-37 above.
- 40 The Department recognizes that "cradle-to-grave" waste management is a benefit of the INEL and LANL alternatives.

January 17, 1996

Mr. Wade Carroll
MIPP EIS Document Manager
Office of Nuclear Energy
Science and Technology (NE-70)
U. S. Department of Energy
19901 Germantown Road
Germantown, MD 20874

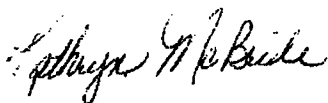
ACCEPTANCE FOR USE OF THE INEL POWER BURST FACILITY

Dear Mr. Carroll:

1 | I fully agree with the use of the INEL's Power Burst Facility to produce medical isotopes for
2 | medical missions. I see no reason why the United States should be dependent on foreign sources
of isotopes when we can produce them here in the states. Also, using an existing reactor to
produce the isotopes further promotes this mission.

Thank you for your consideration.

Sincerely,



Kathryn A. McBride
4414 So. 5th West
Idaho Falls, Idaho 83404

Responses to Comment Letter C025

- 1 Comment noted.

- 2 The problem with the Mo-99 supply situation is not that the supply is from a foreign country. The problem is that the entire U.S. supply comes from a single source. It should also be noted that this single source accounts for about 85% of the world supply of Mo-99. If this source were to become unavailable, production facilities in other countries would most likely focus on meeting their own needs first and, in any case, would not be able to meet even half of U.S. demand for Mo-99. Given this supply situation, the Department has proposed establishing a domestic production source to ensure that a reliable supply of Mo-99 is available to the U.S. medical community.

January 17, 1996

Sheryl Doyle
253 W. Elm
Lava Hot Springs, ID 83246

Wade Carroll
MIPP-EIS Document Manager
USDOE - Office of Isotope Production
NE-70
19901 Germantown Rd.
Germantown, MD 20874

Dear Mr. Carroll,

As a resident of the state of Idaho, I would like to recommend that the I.N.E.L. be chosen as the site for the production of medical isotopes.

Sincerely,



Sheryl Doyle
(208) 776-5017

Response to Comment Letter C026

1 Comment noted.

January 17, 1996

Mr. Wade Carroll,
MIPP EIS Document Manager
Office of Nuclear Energy
Science and Technology (NE-70)
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874

Subject: INEL POWER BURST FACILITY FOR MEDICAL MISSIONS

Dear Mr. Carroll:

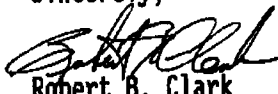
1 | Please include my opinion in favor of utilizing the existing Power Burst
Reactor (PBF) for producing Medical isotopes for cancer and heart disease,
screening and therapy. It is my understanding this reactor is on the DOE
lists as one of four reasonable options for producing the widely used medical
isotope, molybdenum-99.

2 | I work for Lockheed Martin Idaho Technologies (LMIT) at the INEL, and as such,
am familiar with the technology that exists here to facilitate this project.
Additionally, the INEL has the expertise to bring what was once a cold war
Laboratory to helping medical advancements such as this.

Please note that although I work for LMIT, I was not solicited to provide this
recommendation, and do so at my own choice.

Again, I solicit your consideration for the INEL PBF as the final choice for
this favorable project.

Sincerely,


Robert B. Clark
6674 North 25th East
Idaho Falls, ID 83401

Responses to Comment Letter C027

- 1 Comment noted.
- 2 The Department recognizes and appreciates the contributions that the INEL and the other alternative sites made during the Cold War. Each of the sites under consideration has considerable expertise in projects involving nuclear technologies.

MR Wade Carroll E.I.S. Project Manager
Office of Nuclear Energy Science and Technolgy
U.S. Dept. of Energy 19901 Gernantown Road
Germantown, Maryland 20874-1290

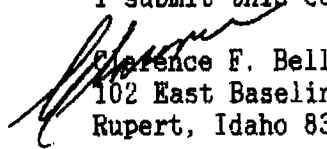
Dear Mr. Carroll

1 I understand that the Sandia, New Mexico site for the production
of MO 99 is a number one priority facility. But, transportation
is required from the Los Alamos site for final production. Low
level waste goes to the Nevada test site. There is no guarantee
that Nevada will continue to accept the Sandia waste. In that
light I see some speculation; that may put production of MO 99
at risk.

2 For further consideration, at the Power Burst site at I.N.E.L.
Idaho eliminates that risk. By constructing or moving in a Hot
Cell from Test Area North or elsewhere to the Power Burst; could
be a one stop shop at the Power Burst. To further enhance the
3 Radio-Medical potential the Power Burst facility has been identi
fied for Brain Tumor treatment.

4 Now that Idaho has been destined to receive High Level Waste
for the next 40 years waste storage from MO 99 would not be a
concern, as you can see at Sandia. There is also a remote possi
bility that some of the incoming Waste could be used in the pro
duction of MO 99.

I submit this comment for consideration.


Clarence F. Bellem
102 East Baseline
Rupert, Idaho 83350

Responses to Comment Letter C028

- 1 As described in the EIS, some transportation of Mo-99 and small quantities of low-level waste would be required at any of the alternatives considered. The potential impacts of transportation activities are described in Section 5.11. For some of the alternatives, this transportation would take place almost exclusively onsite, while others would require use of public roads. The ORNL alternative and the preferred alternative both would require periodic shipments of low-level waste to the Nevada Test Site (NTS). The NTS is preparing a site-wide environmental impact statement and has included waste generated from the Mo-99 mission in the quantities and description of materials to be stored on the site. The ultimate disposition of waste generated under the proposed project may change based on future decisions resulting from the DOE Waste Management Programmatic EIS (DOE 1995a).
- 2 The option of having a hot cell built or moved to the Power Burst Facility (PBF) site has been studied by DOE and discussed with the Idaho site. This would obviate the need for shipping irradiated targets from PBF to the hot cells, but would adversely impact both the cost and the schedule.

Similarly, moving a hot cell is impractical. The lead glass windows and manipulators can be scavenged from other cells, if they are adequate, and installed in cells built to be co-resident with the PBF. Three targets irradiated at a target fission power level of 20 kW contain 99,600 curies of activity after an 8-hour cooling time. Few manipulators or windows in hot cell facilities are designed to accommodate this level of activity. A building would also be required. The ventilation system must be designed such that airborne fission products are captured and not released to the atmosphere.

A detailed estimate to build a new hot cell at SNL/NM totals well over the \$4.8 million indicated in the EIS for INEL hot cell preparation. The SNL/NM estimate is based on building the cell in an existing building and obtaining manipulators and windows for the cost of shipping only. Several million dollars would need to be added to the Idaho cost estimate if a new hot cell facility were to be added. Also, despite being a parallel path activity, the schedule would most likely be adversely impacted, and a 2-year schedule would probably not be achievable. The building and the cells need to be completed early (probably within a year) to be capable of establishing the chemical process stations and waste management facilities required for the Mo-99 mission.

- 3 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 4 The Department does not plan to ship any of the small quantities of waste which would be generated by the proposed Medical Isotopes Production Project to INEL. Only waste generated at INEL would be disposed at INEL. Since the anticipated quantities of low-level waste are small, the Department does not view waste disposal as a significant barrier to implementing production at any of the alternative sites.

Spent fuel from production of medical isotopes would be managed in accordance with the Record of Decision from the Spent Nuclear Fuel Programmatic Environmental Impact Statement (SNF PEIS) (DOE 1995b). Sufficient supply of highly enriched uranium is available for the production of Mo-99; the extraction of uranium from spent fuel for Mo-99 production does not need to be considered.

Jan. 18, 1996

David A. Griffiths
4633 East Caribou Drive
Idaho Falls, Idaho 83401

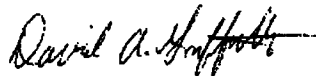
Mr. Wade Carroll,
MIPP EIS Document Manager,
Office of Nuclear Energy,
Science and Technology (NE-70),
U.S. Department of Energy,
19901 Germantown Road,
Germantown, Maryland 20874

Dear Mr. Carroll:

On Wed. Jan. 17, at the Shilo Inn in Idaho Falls, Idaho, a public hearing was conducted by the Department of Energy to gauge public acceptance for using an INEL reactor for medical missions. I was unable to attend these hearings but wish to convey to you my overwhelming support for such a venture at the INEL.

Having considered the issues already in past discussions, I know this would have a very beneficial impact not only to the Medical Community but also to the local Idaho Falls economy. We have an important asset in the INEL that I believe can be put to much greater use.

Sincerely,



David A. Griffiths

Response to Comment Letter C029

- 1 Comment noted.



OFFICE OF THE MAYOR
911 North 7th Avenue
P.O. Box 4169
Pocatello, Idaho 83205
(208) 234-6163
FAX (208) 234-6297

PETER J. ANGSTADT
Mayor

Pocatello City Council:
GREGORY R. ANDERSON
J.J. "Babe" CACIA
ROGER W. CHASE
RON BRASURE
KAREN MCGEE
HARRY NEUHARDT

January 24, 1996

Wade Carroll, EIS Documents Manager
Office of Nuclear Energy, Science & Technology
U.S. Department of Energy
19901 Germantown Rd., NE-70
Germantown, Maryland 20874

Dear Mr. Carroll:

The application of radioisotopes to medical diagnostics and therapeutics is an indispensable and on-going component of the American health care system. The United States consumes 80% of the world supply of radioisotopes, yet no U.S. commercial supplier exists. We are totally dependent on foreign entities for the supply of Molybdenum-99, a critical medical radioisotope used for 36,000 medical procedures daily, 100 million laboratory tests and 50,000 therapies yearly. The application of medical isotopes for these diagnostic and therapeutic procedures provides significant advances in the treatment of cancer and other life threatening conditions. The U.S. is the leader in health care, but that enviable position is threatened in this area by our dependence on foreign suppliers. In addition, a shortage of radioisotope supply can delay the development of new drugs.

The Department of Energy's (DOE) complex of facilities offers an unmatched radioisotope capability. The Idaho National Laboratory (INEL), as an integral part of the DOE system, is uniquely equipped to assume the role of national leadership. There exists real opportunities for those who care to look forward to the future and adapt to change. A major asset of the INEL is the scientific knowledge and professional network already available and the successful history of the INEL.

In order to be successful as a supplier of medical isotope, there are several critical factors such as reliability of supply, quality of product, cost competitiveness, and continuous improvement. The INEL stands ready to meet these challenges.

Sincerely,

Peter J. Angstadt
Mayor

/cb

AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER

Response to Comment Letter C030

1 Comment noted.

**ECSI EXECUTONE**BUSINESS PHONE SYSTEMS
INTERCOM, PAGE, FAX
HOSPITAL SYSTEMS*"People Helping People Communicate Professionally"*Wade Carroll, MIPP-EIS Document Manager
U.S. Dept. Of Energy NE-70
19901 Germantown RD.
Germantown, MD. 20874

January 25, 1996

Dear Mr Carroll;

Due to circumstances with my employment, it was impossible for me to attend the hearings on production of medical isotopes in conjunction with the Boron Neutron Capture Therapy (BNCT) project. I am, however, familiar with the concept and DO support the project.

Along with the many advantages stated in the Chamber of Commerce letter dated January 12, 1996, there is also the advantage of the additional business brought to Idaho Falls by those people seeking treatment. Further, the support services required for an influx of out of area people would be enhanced. As well as the turn over of the dollars throughout the economy.

Upon investigation, I can find absolutely no negative results from having the Medical Isotope facility at INEL.

Sincerely Yours,

Ted A. Kasper
Sales Manager

cc: B Sewell

P.O. BOX 3218
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FAX (208) 529-9950IDAHO FALLS (208) 529-9400
POCATELLO (208) 232-3800

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Responses to Comment Letter C031

- 1 Comment noted.
- 2 Individuals requiring the use of radioactive isotopes, including Tc-99m, will continue to receive these treatments and diagnostic procedures in hospitals throughout the country. Individuals will not receive or undergo these medical procedures at any of the alternative Mo-99 production sites considered. The Department acknowledges that the initiation of the proposed Medical Isotopes Production Project at any of the alternative sites could provide opportunities for private business to support the project directly or develop derivative initiatives.

The anticipated socioeconomic impacts of the proposed project are discussed in Section 5.3.



SIERRA CLUB

Albuquerque Group
207 San Pedro Avenue NE
Albuquerque, NM 87108
Phone (505) 265-5508

Public Hearing Comment
for the
Medical Isotopes Production Project (MIPP):
Molybdenum-99 and Related Isotopes
Draft Environmental Impact Statement (Draft EIS)

January 30, 1996
Indian Pueblo Cultural Center
Main Auditorium
2401 12th St
Albuquerque, New Mexico, 87104

Wade Carroll, MIPP-EIS Document Manager
U.S. Department of Energy, NE-70
Germantown, Maryland 20874,
Fax 301 903-5434
Phone: 301 903-7731

Dear Mr. Carroll,

The Albuquerque Group of the Sierra Club finds the Draft EIS, when judged by other DOE findings and issues that need to be addressed, to be seriously deficient. Thus, the Albuquerque Group, which has members who would support domestic production of medical isotopes, finds that it has grave reservations about the proposed project at SNL/NM.

The Albuquerque Group requests, for the record, the following concerns be addressed:

1. We request that the Department of Energy provide supporting documentation that the Canadian supply for molybdenum-99 is not reliable. Specifically, we request a letter from Canadian sources that stipulates that:
 - * The Atomic Energy of Canada Limited definitely plans to shut down the Canadian reactor near the end of the century.
 - * Nordion International and Atomic Energy of Canada Limited will not be able to meet U.S. demand.

Our reason for this request is that we do not believe that the Department of Energy has met a sufficient burden of proof requirement of need that the Canadians are not able to meet U.S. needs. If the Canadians plan to meet our

-1-

1 needs, then this project represents an unnecessary burden on American Taxpayers, justifiable only as a job creation project. If a test of need is not the key reason for this project, the attendant environmental, health, and safety risks that the project imposes upon the citizens of Albuquerque are unreasonable and unjustifiable.

2 2. The Draft EIS does not cite or examine the findings of vulnerability and adverse conditions noted in D.O.E.'s Plutonium Working Group Report, September 1994, Volume I and II, Appendix B, Part 10: Sandia National Laboratories-New Mexico Site Assessment Team Report.

* On Spent Nuclear Fuel (4.1.14.2) on page 4.20, the Manzano Storage Structures are cited as a facility at SNL/NM for storage. Yet, it fails to discuss the unique landlord problem at SNL/NM. DOE's Plutonium Working Group stated in Volume I:

Storage of DOE materials in non-DOE facilities (i.e., the Nuclear Materials Storage Facility and the Manzano Facility) is a vulnerability unique to SNL/NM. DOE does not have control over, or ready access to, these facilities Also, if DOE materials have to be removed on short notice, SNL/NM may have no facilities suitable for storage."

In Volume II, it notes an additional vulnerability: "the lack of safety authorization" for vault storage, and, "no safety documentation for storage."

The Albuquerque Group wonders why this DOE finding is not in DOE's Draft EIS?

3 3. On the Hot Cell Facility, critical to target processing and Mo-99 separation, the following Adverse Conditions are noted in Volume II, Appendix B, Part 10, Pages A 10-11:

"Aging," "equipment failure," and "administrative controls." In the narrative description, "seals" are noted to be aging. Equipment failure of safety systems lists cranes and hoists; shielded casks. Inadequate preventive maintenance, equipment fatigue or malfunction are also cited. Some are listed as possible vulnerabilities, others as existing.

The Draft EIS misleads readers when it does not tell the whole story, but simply notes that the "current configuration" of the Hot Cell "would only be able to conduct limited processing activities." And that "A new cell would be constructed ... to enable steady state production of greater than 10% and up to 100% of the U.S. demand for Mo-99." (p. 3.8) ."

4 4. On the Annular Core Research Reactor, critical to Mo-99 target irradiation, the "In-Facility Adverse Conditions" checked off are: "Aging" and "Potential Water Sources."

4 Aging for a facility that is 31 years with a design life of 50 years is described as materials deterioration: the lined storage vaults and Dense Pack holes. The latter are stated to be "even more susceptible to the effects of the environment and aging." Since the Dense Pack holes are "located outside, there is a remote chance of water leakage into the holes either through the top of the holes or through the ground into the holes." While these may be low probability, low consequence risks, they are real. That they are not noted in the Draft EIS indicates just how inadequate, if not misleading, the Draft EIS is.

5 5. Storage Vault problems are also noted. Among them are "inadequate seals." Perhaps more disturbing, uncertainties or concerns regarding "Compensatory Measures," note the following weaknesses:

Under the section on Preventive Measures:

- * Procedures: ops., maint., Surveillance;
- * Material limits
- * Training
- * Controlled Access

Under the section on Mitigative problems, vulnerabilities and uncertainties relate to:

- * Emergency Preparedness
- * Emergency Management
- * Emergency Planning
- * Emergency Procedures
- * Emergency Response
- * Alarm Systems.

We would like these problems addressed in the EIS.

6 Waste stream management is a critical step in the Cintichem process approved by FDA for the production and separation of Mo-99 sold in the U.S. The Draft EIS notes that "any waste generated by Mo-99 production would be managed consistent with DOE's complex-wide Programmatic Environmental Impact Statement (PEIS) for waste management (P. 1.4). The PEIS, as noted in the Draft Mo-99 EIS, is still in Draft form. If so, it indicates the nation's waste management problem is still to be resolved. The Albuquerque Group wonders about the wisdom of rushing to produce Mo-99 when the waste management problem remains unsolved.

In this regard, the Albuquerque Group should like to call attention to one disturbing problem:

- * DOE has made a letter public that it requested a Blue Ribbon EPA Panel to investigate charges by individuals who contributed to the drafting of the PEIS that the PEIS was not a reliable document because of contractor malfeasance. The EPA panel is on record warning DOE that the charges raised should be taken seriously. Acting DOE Under Secretary Tom Grumbly has released the EPA report.

6 The resolution of this issue alone warrants a decision to
postpone Mo-99 production in the U.S., for it also suggests
DOE is a long way from solving the waste management
problem.

7 The Albuquerque Group of the Sierra Club holds additional
concerns relating to the production of Mo-99 in the U.S. in
general and at SNL/NM in specific. These have to do with:

- 8 * Tritium releases and air quality problems. This
problem is glossed over in the Draft (P. 5.8).
- 9 * Environmental Justice Issues - impacts on ethnic
minorities and disadvantaged people are not fully
analyzed, and
- 10 * Water consumption; the increased use of water, a
critical and scarce natural resource in a City that
has just initiated a major water conservation
program, needs fuller analysis.
- * Accident scenarios. The vulnerabilities listed
above need to be addressed as well as those mentioned
in the Draft - e.g., plane crashes.

We believe the Draft EIS on the preferred Mo-99 production
option is weak in its coverage of these issues. We believe
that they too require DOE's closer attention.

We appreciate the opportunity to present our concerns
today. We should like all these issues to be addressed in
the Final EIS. At this time, we are disturbed by the
omissions and weaknesses. We do not find the Draft EIS to
be adequate. We do not find the case made for Mo-99
production to be sound or necessary.

Respectfully submitted,



Jay B. Sorenson
Issue Chair



Richard Barish
Conservation Chair



Susan Gorman
Group Chair
Albuquerque Group
Sierra Club

Responses to Comment Letter C032

- 1 The Department has not received, nor does it expect to receive, written notice from Nordion International or the Canadian government stating that they may not be a reliable supplier of Mo-99 in the future. (See letter from Nordion International-C068.)

The problem with the Mo-99 supply situation is not that the supply is from Canada (or from any foreign country, for that matter). The problem is that the entire U.S. supply comes from a single source. It should also be noted that this single source accounts for about 85% of the world supply of Mo-99. If this source were to become unavailable, production facilities in other countries would most likely focus on meeting their own needs first, and in any case would not be able to meet even half of U.S. demand for Mo-99. Therefore, the Department has proposed to establish a domestic production source to ensure that a reliable backup supply of Mo-99 is available to the U.S. medical community.

- 2 DOE and SNL/NM would plan to store spent fuel generated by the medical isotope production only in DOE-owned and -controlled storage facilities covered by appropriate DOE-approved safety documentation. The report referenced by the Sierra Club addresses only plutonium issues and was intended to "identify the ES&H vulnerabilities associated with the current storage of plutonium at the Department of Energy Facilities." That report addresses plutonium-specific issues which for the most part have no connection with the use of SNL/NM facilities as presented in this EIS. Risks from the handling of plutonium at these facilities is not within the scope of this EIS.
- 3 The two vulnerabilities identified by the Working Group Assessment Team (WGAT) have no connection to the SNL/NM facilities discussed in the Draft EIS. The Executive Summary of Vol. II, Appendix B, Part 10 states, "The WGAT identified two vulnerabilities associated with plutonium materials storage. The first vulnerability addresses a lack of up-to-date safety authorization basis and documentation for the storage facilities. This deficiency has been previously identified and SNL/NM is currently working on the corrective action. The second vulnerability identified concerns about the lack of package characterization for a [plutonium] metal disk in storage."

Regarding the "aging" of seals, the Plutonium Working Group Report states, "seals are used in experiment and storage vessels and could deteriorate over time..." not that "seals are noted to be aging" as stated in the comment letter.

Regarding "equipment failure," the quoted portion of the Plutonium Working Group Report states, "Equipment failure of safety systems (HVAC) or support equipment (cranes and hoists, shielded casks) can adversely affect the operations in the facility and potential release of radioactive materials to the environment. Equipment failures can be a result of inadequate preventive maintenance, equipment fatigue or malfunction." This statement differs with the commentor's position that "Inadequate preventive maintenance, equipment fatigue or malfunction are also cited."

- 4 This EIS contains an analysis of the reasonably foreseeable environmental impacts, which is intended to demonstrate the relative magnitude of the maximum consequences associated with each of the alternatives. The types of consequences associated with facility operation under routine and accident conditions are therefore presented for "bounding" normal operations and reasonably foreseeable accidents. Events that are not specifically evaluated in the EIS would therefore have lower consequences than those that are presented. A safety analysis that evaluates all potential accident scenarios is beyond the scope of the EIS; however,

such an analysis would be prepared for all facilities associated with the Medical Isotopes Production Project before initiating activities at any of the alternative sites. In addition, all facilities would be subject to an operational readiness review before they are allowed to restart to ensure that there are no outstanding safety or security issues that remain to be resolved.

- 5 The current plans, as provided as input to this EIS, do not call for use of the Storage Vault Building nor is it reasonable to foresee that this facility would be used to support the production of medical isotopes. Therefore, the use of that facility is outside the scope of this EIS.
- 6 The quantity of waste which would be generated by the proposed Medical Isotopes Production Project at any of the alternatives is small. The storage and disposal of the minimal amounts of low-level waste will take place at the Nevada Test Site for two of the alternatives considered; for the other two alternatives, low-level waste will be stored in existing DOE-approved facilities onsite. When the Waste Management Programmatic EIS is finalized, the Medical Isotopes Production Project will ensure that waste generated during project activities is disposed of in a manner consistent with the Record of Decision for that EIS.
- 7 The effects of all tritium emissions and of other radionuclides that would be released from medical isotope production facilities are evaluated in the EIS. The emissions would result in doses to the maximally exposed offsite individual that are less than 2% of the EPA standard, and no health effects would be expected in the population within 50 miles from these releases (see Table 5-3). Emissions of nonradio-logical pollutants would likewise not be sufficient to measurably impact air quality in the Albuquerque region.
- 8 The Department found that there would be small, if any, environmental impacts from the implementation of medical isotopes production at any of the alternative sites. Thus, there are not any anticipated disproportionately high or adverse impacts to ethnic minorities and disadvantaged people that would result from the implementation of the proposed project. Section 5.21 provides a comprehensive analysis of environmental justice issues.
- 9 This EIS reports that water usage at SNL/NM for the production of medical isotopes would be 40,000 m³ year (10.6 million gallons/year). This would be only 0.03% of the 40.6 billion gallons of water pumped by the City of Albuquerque in 1995. Seventy-one percent of the water pumped by the City is distributed to single- and multi-family residences.
- 10 The consequences of an aircraft crash are presented in Section 5.15.1.3 of the EIS. This accident represents the design basis accident for the Annular Core Research Reactor. Similar accidents were also considered for the other facilities (e.g., hot cells), but were found to have risks or consequences that were lower than the accidents evaluated and presented in this EIS.

1 | IANS Statement Re: Production of Medical Isotopes J. C. C. - 01/17/96

170 Fieldstream Lane, Idaho Falls ID 83404

My name is John Commander. I am Vice Chair of the Idaho Section of the American Nuclear Society, and represent some 900 members located predominately in Southeast Idaho. I have been authorized by the Section Chair Charles Gilmore, to make a statement concerning our endorsement of the DOE project for the production of medical isotopes for the screening and therapy of cancer and heart disease; and our endorsement of the project being located at the Power Burst Facility at the Idaho National Engineering Laboratory.

We beleive the PBF site is technically and economically superior among the four DOE sites being considered for the Isotope Production Project based upon the following advantages of the INEL siting alternative.

2 | The PBF reactor is the only alternative that uses low-enriched uranium fuel, which reduces waste generation and security requirements.

3 | Lowlevel waste from operation of PBF can be disposed of on site, whereas waste from the preferred site would require packaging and shipping off site.

4 | PBF lower operating cost and lower environmental impact should be given greater consideration.

5 | PBF is the only alternative which envisions the isotope production project acquization by private enterprise.

6 | PBF is suitable for both the Isotope Production Project and the Boron Neutron Capture Therapy mission.

7 | and; PBF provides the technical ability to produce 100 % of the nations demand for these isotopes.

In summary, we beleive that coupling the Isotope Production Project with the BNCT mission will be the most cost effective, saving millions of dollars; will produce on the order of 120 high technology, high compensation jobs for the Southeast Idaho economy; and will provide for the desired technology transfer to the private sector. Southeast Idaho has always supported these kind of projects at INEL, and we are confident that this hearing will provide evidence of staunch support for location of the Isotope Production Project at the INEL.

Responses to Comment Letter C033

- 1 Comment noted.
- 2 The Power Burst Facility is the only option currently using low enriched uranium fuel. All the other options evaluated in detail have designs for converting to low enriched uranium. The objective is not to build any more highly enriched uranium fuel bundles for any of the other options, but to use the fuel already on hand until the supply is exhausted or, in the case of the Annular Core Research Reactor (ACRR), until the burnup limit is reached—see Section 3.3.1.9. Two or three transition cores of both low enriched uranium and highly enriched uranium would be used during the conversion to all low enriched uranium fuel. This is a long-term safeguards advantage, in that it depletes and irradiates the weapons grade material on hand.

It is not true that use of low enriched uranium fuel minimizes waste. More spent fuel bundles are generated per reactor full power year with the use of low enriched uranium bundles.
- 3 The INEL alternative and the LANL alternative both would allow the small quantities of low-level waste to be stored onsite. The commentor is correct in identifying that both the preferred alternative and the ORNL alternative would require some shipment of low-level waste to the Nevada Test Site (NTS). The NTS is preparing a site-wide environmental impact statement and has included waste generated from the Mo-99 mission in the quantities and description of materials to be disposed on the site.
- 4 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

The potential environmental impacts of the four production alternatives analyzed in the EIS were found to be essentially the same for each alternative and, in all cases, were found to be low.
- 5 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE. The Department is aware of this potential for the INEL alternative. Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed medical isotopes production project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.
- 6 As stated above, the IBTC has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 7 All of the alternative reactors would (after necessary modifications) have the capability to provide at least 100% of the U.S. demand for Mo-99.

Mr. Wade Carroll, MIPP EIS Document Manager
Office of Nuclear Energy, Science, and Technology (NE-70)
US Department of Energy
19901 Germantown Road
Germantown MD 20874

Dear Mr. Carroll,

This letter is a citizens input regarding the location of a medical isotope generation facility in at the Idaho National Engineering Laboratory (INEL).

1 | I favor locating the project in Idaho. Please consider my reasons.

Idahoans, heretofore benignly accepting of the receipt and processing of spent nuclear fuel at the INEL, have in recent years become hostile to the idea, even though there is no demonstrable health risk to Idahoans.

The cessation of fuel processing at the Idaho Chemical Processing Plant (ICPP) and delays in opening the Waste Isolation Processing Plant (WIPP) are, I believe principally responsible for this shift in public opinion.

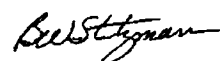
Devoutly anti-INEL individuals have offered themselves into running for public office. I believe that, except for South East Idaho, they will sweep the state. This places the INEL in great jeopardy.

The INEL has not convincingly demonstrated a tangible benefit to Idaho, except to the imports who come in to suck up big money jobs, in the opinion of many Idahoans.

Locating the medical isotope production project at the INEL gives the INEL an identifiable, advertizable benefit that will help abate criticism, while other activities continue that are also expedient to the US government.

2 | Locating the medical isotope production facility at the INEL is less expensive than its alternatives. Skilled analytical personnel and maintenance workers who are accustomed to working in high contamination situations are available without additional training.

I encourage your consideration to these and other opinions expressed, that offer BROAD SUPPORT for locating the isotope production facility at the INEL. Thank you for your attention.



Ben Stutzman
826 Jeri Ave.
Idaho Falls, ID 83402-2539-34
208-523-6418

Responses to Comment Letter C034

- 1 Comment noted.
- 2 The INEL and the other alternative sites have the facilities and skilled personnel available to conduct the medical isotope production activities.

January 30, 1996

Mr. Wade Carroll, MIPP EIS Document Manager,
Office of Nuclear Energy, Science and Technology (NE-70),
U.S. Department of Energy,
19901 Germantown Road,
Germantown, Maryland 20874

PUBLIC HEARING

Dear Mr. Carroll:

1 The danger of losing the vitality and preeminence of the Idaho National Engineering Laboratory (INEL) as a national resource is, of course, not a new reason for assigning new projects in the DOE community. We, at a state and local level, however, keenly feel the threat and the implied results of such decisions. I'm sure you are well aware of the precarious position and the great danger this specific facility faces of closing down entirely due to lack of projects in the national perspective. Such an occurrence would be disastrous for the state and local economies, as well as a step backward nationally and internationally. Locating the project for the production of medical isotope (Molybdenum-99) and other continuing projects here would allow the survival of an international, world class facility.

2 While I am not an expert in available resources, I do know initial research has been conducted here. We have the work force, the work ethic, the facilities, and the ability to provide the necessary support.

Please consider, not only the immediate demands of the project, but the larger, broader perspective of the consequences of the decision impacting the DOE community as a whole.

Sincerely,



L. Rand Ricks
Instructional Support SPC.

Responses to Comment Letter C035

- 1 The Department realizes the importance of all its laboratories to their respective state and local economies as well as the importance of preserving the valuable technical capabilities each laboratory possesses.
- 2 The INEL and the other alternative sites have the facilities and skilled personnel available to conduct the medical isotope production activities.



San José Community Awareness Council, Inc.

(505) 243-4837

FAX (505) 243-3085

"To empower our community to solve our own problems"

2401 Broadway SE, 87102-5009

• P.O. Box 12297 •

Albuquerque, New Mexico 87195-2297

January 26, 1996

Wade Carroll
 EIS Project Manager
 Office of Nuclear Energy, Science & Technology (NE-70)
 U. S. Department of Energy
 19901 Germantown Road
 Germantown, Maryland 20874-1290

Re: Draft DOE/EIS-0249D

Dear Mr. Carroll:

Thank you very much for submitting the above referenced "draft" document for public comment. After review we offer the following response:

1. 1.) Please advise who are the technical advisor(s)/organization that assisted the department in research, assessment and preparation of the document.
2. 2.) Please identify and explain proposed recreational-industrial future land uses.
2. 3.) Proposed/planned future use should be discussed including overview and plan of action for the following:
 - a.) Sandia Withdrawal Area (east of military facility).
 - b.) Contaminated Landfills, i.e., CHEM WASTE LANDFILL, others.
3. 4.) (2-13) The EA did not adequately address the issue of "Risk Assessment" based on the limited information made available. The conservative assumptions did not sufficiently detail determination for "cleanup" as contaminants of concern were not identified and quantified for all project sites. The types of contaminants, extent of contamination, medium in which contaminants have made contact and potential to come in contact with, and surrounding environment must be considered to achieve a high quality "Risk Assessment". The utility of risk assessments depends on



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3 | the validity of existing data, the models used, and the assumptions made in
the absence of appropriate data.

- 4 | 5.) (3-17) The existing production wells located at KAFB and Albuquerque
influence groundwater flow direction, and potential migration of
contaminants is an overarching concern, hence see #4 above. Therefore, a
complete overview of contaminants in ER's will assist in remediation
effectively and as one "cleanup" scenario may influence another that is in
close proximity, and save time and resources.

The SNL's unconfined aquifer allows anything that seeps into the
groundwater, regardless of zone, to affect the pumping of wells. Should
the water become impacted by pollution, the production wells will be a
factor in assisting the spreading of contamination and decreasing the fresh
water sources available.

- 5 | 6.) (3-30) NEPA is public involvement. Please see attachment "A".
7.) the issue of how the "waste" will be treated should be explained:

- 6 | a.) On-Site
b.) Manifested-Transported
c.) Off-Site

Thank you very much. If you have questions please contact me at (505) 243-4837 or
Frances Ortega, (Consultant-Researcher) at (505) 262-1862.

Sincerely,


Dolores S. Herrera
Executive Director

DSH:mkr

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Federal Register

Vol. 59, No. 32

Wednesday, February 16, 1994

Presidential Documents

Title 3—

Executive Order 12898 of February 11, 1994

The President

Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1-1. IMPLEMENTATION.

1-101. *Agency Responsibilities.* To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands.

1-102. *Creation of an Interagency Working Group on Environmental Justice* (a) Within 3 months of the date of this order, the Administrator of the Environmental Protection Agency ("Administrator") or the Administrator's designee shall convene an interagency Federal Working Group on Environmental Justice ("Working Group"). The Working Group shall comprise the heads of the following executive agencies and offices, or their designees: (a) Department of Defense; (b) Department of Health and Human Services; (c) Department of Housing and Urban Development; (d) Department of Labor; (e) Department of Agriculture; (f) Department of Transportation; (g) Department of Justice; (h) Department of the Interior; (i) Department of Commerce; (j) Department of Energy; (k) Environmental Protection Agency; (l) Office of Management and Budget; (m) Office of Science and Technology Policy; (n) Office of the Deputy Assistant to the President for Environmental Policy; (o) Office of the Assistant to the President for Domestic Policy; (p) National Economic Council; (q) Council of Economic Advisers; and (r) such other Government officials as the President may designate. The Working Group shall report to the President through the Deputy Assistant to the President for Environmental Policy and the Assistant to the President for Domestic Policy.

(b) The Working Group shall: (1) provide guidance to Federal agencies on criteria for identifying disproportionately high and adverse human health or environmental effects on minority populations and low-income populations;

(2) coordinate with, provide guidance to, and serve as a clearinghouse for, each Federal agency as it develops an environmental justice strategy as required by section 1-103 of this order, in order to ensure that the administration, interpretation and enforcement of programs, activities and policies are undertaken in a consistent manner;

(3) assist in coordinating research by, and stimulating cooperation among, the Environmental Protection Agency, the Department of Health and Human Services, the Department of Housing and Urban Development, and other agencies conducting research or other activities in accordance with section 3-3 of this order;

(4) assist in coordinating data collection, required by this order;

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(5) examine existing data and studies on environmental justice;
(6) hold public meetings as required in section 2-502(d) of this order; and

(7) develop interagency model projects on environmental justice that evidence cooperation among Federal agencies.

1-103. Development of Agency Strategies. (a) Except as provided in section 5-605 of this order, each Federal agency shall develop an agency-wide environmental justice strategy, as set forth in subsections (b)-(e) of this section that identifies and addresses disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The environmental justice strategy shall list programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to, at a minimum: (1) promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations; (2) ensure greater public participation; (3) improve research and data collection relating to the health of and environment of minority populations and low-income populations; and (4) identify differential patterns of consumption of natural resources among minority populations and low-income populations. In addition, the environmental justice strategy shall include, where appropriate, a timetable for undertaking identified revisions and consideration of economic and social implications of the revisions.

(b) Within 4 months of the date of this order, each Federal agency shall identify an internal administrative process for developing its environmental justice strategy, and shall inform the Working Group of the process.

(c) Within 6 months of the date of this order, each Federal agency shall provide the Working Group with an outline of its proposed environmental justice strategy.

(d) Within 10 months of the date of this order, each Federal agency shall provide the Working Group with its proposed environmental justice strategy.

(e) Within 12 months of the date of this order, each Federal agency shall finalize its environmental justice strategy and provide a copy and written description of its strategy to the Working Group. During the 12 month period from the date of this order, each Federal agency, as part of its environmental justice strategy, shall identify several specific projects that can be promptly undertaken to address particular concerns identified during the development of the proposed environmental justice strategy, and a schedule for implementing those projects.

(f) Within 24 months of the date of this order, each Federal agency shall report to the Working Group on its progress in implementing its agency-wide environmental justice strategy.

(g) Federal agencies shall provide additional periodic reports to the Working Group as requested by the Working Group.

1-104. Reports to the President. Within 14 months of the date of this order, the Working Group shall submit to the President, through the Office of the Deputy Assistant to the President for Environmental Policy and the Office of the Assistant to the President for Domestic Policy, a report that describes the implementation of this order, and includes the final environmental justice strategies described in section 1-103(e) of this order.

Sec. 2-2. FEDERAL AGENCY RESPONSIBILITIES FOR FEDERAL PROGRAMS. Each Federal agency shall conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including popu-

lations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin.

Sec. 3-3. RESEARCH, DATA COLLECTION, AND ANALYSIS.

3-301. Human Health and Environmental Research and Analysis. (a) Environmental human health research, whenever practicable and appropriate, shall include diverse segments of the population in epidemiological and clinical studies, including segments at high risk from environmental hazards, such as minority populations, low-income populations and workers who may be exposed to substantial environmental hazards.

(b) Environmental human health analyzes, whenever practicable and appropriate, shall identify multiple and cumulative exposures.

(c) Federal agencies shall provide minority populations and low-income populations the opportunity to comment on the development and design of research strategies undertaken pursuant to this order.

3-302. Human Health and Environmental Data Collection and Analysis. To the extent permitted by existing law, including the Privacy Act, as amended (5 U.S.C. section 552a): (a) each Federal agency, whenever practicable and appropriate, shall collect, maintain, and analyze information assessing and comparing environmental and human health risks borne by populations identified by race, national origin, or income. To the extent practical and appropriate, Federal agencies shall use this information to determine whether their programs, policies, and activities have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations;

(b) In connection with the development and implementation of agency strategies in section 1-103 of this order, each Federal agency, whenever practicable and appropriate, shall collect, maintain and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding facilities or sites expected to have a substantial environmental, human health, or economic effect on the surrounding populations, when such facilities or sites become the subject of a substantial Federal environmental administrative or judicial action. Such information shall be made available to the public, unless prohibited by law; and

(c) Each Federal agency, whenever practicable and appropriate, shall collect, maintain, and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding Federal facilities that are: (1) subject to the reporting requirements under the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. section 11001-11050 as mandated in Executive Order No. 12858; and (2) expected to have a substantial environmental, human health, or economic effect on surrounding populations. Such information shall be made available to the public, unless prohibited by law.

(d) In carrying out the responsibilities in this section, each Federal agency, whenever practicable and appropriate, shall share information and eliminate unnecessary duplication of efforts through the use of existing data systems and cooperative agreements among Federal agencies and with State, local, and tribal governments.

Sec. 4-4. SUBSISTENCE CONSUMPTION OF FISH AND WILDLIFE.

4-401. Consumption Patterns. In order to assist in identifying the need for ensuring protection of populations with differential patterns of subsistence consumption of fish and wildlife, Federal agencies, whenever practicable and appropriate, shall collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. Federal agencies shall communicate to the public the risks of those consumption patterns.

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4-402. *Guidance.* Federal agencies, whenever practicable and appropriate, shall work in a coordinated manner to publish guidance reflecting the latest scientific information available concerning methods for evaluating the human health risks associated with the consumption of pollutant-bearing fish or wildlife. Agencies shall consider such guidance in developing their policies and rules.

Sec. 5-5. **PUBLIC PARTICIPATION AND ACCESS TO INFORMATION.** (a) The public may submit recommendations to Federal agencies relating to the incorporation of environmental justice principles into Federal agency programs or policies. Each Federal agency shall convey such recommendations to the Working Group.

(b) Each Federal agency may, whenever practicable and appropriate, translate crucial public documents, notices, and hearings relating to human health or the environment for limited English speaking populations.

(c) Each Federal agency shall work to ensure that public documents, notices, and hearings relating to human health or the environment are concise, understandable, and readily accessible to the public.

(d) The Working Group shall hold public meetings, as appropriate, for the purpose of fact-finding, receiving public comments, and conducting inquiries concerning environmental justice. The Working Group shall prepare for public review a summary of the comments and recommendations discussed at the public meetings.

Sec. 6-6. **GENERAL PROVISIONS.**

6-601. *Responsibility for Agency Implementation.* The head of each Federal agency shall be responsible for ensuring compliance with this order. Each Federal agency shall conduct internal reviews and take such other steps as may be necessary to monitor compliance with this order.

6-602. *Executive Order No. 12250.* This Executive order is intended to supplement but not supersede Executive Order No. 12250, which requires consistent and effective implementation of various laws prohibiting discriminatory practices in programs receiving Federal financial assistance. Nothing herein shall limit the effect or mandate of Executive Order No. 12250.

6-603. *Executive Order No. 12875.* This Executive order is not intended to limit the effect or mandate of Executive Order No. 12875.

6-604. *Scope.* For purposes of this order, Federal agency means any agency on the Working Group, and such other agencies as may be designated by the President, that conducts any Federal program or activity that substantially affects human health or the environment. Independent agencies are requested to comply with the provisions of this order.

6-605. *Petitions for Exemptions.* The head of a Federal agency may petition the President for an exemption from the requirements of this order on the grounds that all or some of the petitioning agency's programs or activities should not be subject to the requirements of this order.

6-606. *Native American Programs.* Each Federal agency responsibility set forth under this order shall apply equally to Native American programs. In addition, the Department of the Interior, in coordination with the Working Group, and, after consultation with tribal leaders, shall coordinate steps to be taken pursuant to this order that address Federally-recognized Indian Tribes.

6-607. *Costs.* Unless otherwise provided by law, Federal agencies shall assume the financial costs of complying with this order.

6-608. *General.* Federal agencies shall implement this order consistent with, and to the extent permitted by, existing law.

6-609. *Judicial Review.* This order is intended only to improve the internal management of the executive branch and is not intended to, nor does it create any right, benefit, or trust responsibility, substantive or procedural.

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enforceable at law or equity by a party against the United States, its agencies, its officers, or any person. This order shall not be construed to create any right to judicial review involving the compliance or noncompliance of the United States, its agencies, its officers, or any other person with this order.

William Clinton

THE WHITE HOUSE,
February 11, 1994.

[FR Doc. 94-2683
Filed 2-14-94; 3:37 pm]
Billing code 3165-01-P

Editorial note: For the memorandum that was concurrently issued on Federal environmental program reform, see issue No. 8 of the *Weekly Compilation of Presidential Documents*.

Responses to Comment Letter C036

- 1 Section 8 of the EIS contains a comprehensive list and overview of qualifications of the EIS authors and technical contributors.
- 2 The SNL/NM Withdrawal Area, which includes all of the DOE and U.S Air Force (USAF) Withdrawal Area, is located within the Cibola National Forest. The area has been used by the DOE and the USAF primarily for weapons testing, but land withdrawn by the DOE is also used for research and development missions and training. The USAF also maintains testing and training activities in the Withdrawal Area. Past and present use of the area has resulted in environmental restoration sites and in unexploded ordnance of unknown quantities.

Recommendations for long-term future use of the land within the Withdrawal Area have been developed by DOE, with cooperative input of the EPA and the New Mexico Environment Department. Recommendations took into account the existing known environmental restoration sites within the Withdrawal Area and their current status in terms of permitting, characterization, and cleanup efforts. Costs and technologies associated with cleanup levels were also considered.

These recommendations are used as a decision-making tool for ongoing environmental restoration operations. One of these recommendations is to classify the Withdrawal Area as a recreational site for purposes of future use planning and determination of appropriate cleanup levels. However, this will depend on the status of environmental impacts and environmental restoration in the area. Future missions are likely to be associated with long-term institutional controls which will remain in place for the foreseeable future. As of February 1996, no actual future use plans had been developed for the Withdrawal Area and no change in land use was expected in the foreseeable future.

DOE's *Draft Environmental Assessment of the Environmental Restoration Project at Sandia National Laboratories/New Mexico* (DOE/EA-1140) (DOE 1995h) lists 157 potential cleanup sites at SNL/NM. The specific site locations, contaminants found at the sites, and proposed methods of treatment can all be found in this document. Briefly, DOE proposes to conduct site characterization and cleanup, using a range of treatment options, in compliance with applicable laws and regulations. DOE estimates that the cleanup activities would continue for approximately 10 years, beginning in FY 1996.

The Chemical Waste Landfill (site # 74) also detailed in the above-cited environmental assessment, is located in Tech Area V. It is about 83,000 square feet in area; contains various types of waste, including volatile organic compounds, radionuclides, and metal debris; and would be treated using removal, decontamination, excavation, and capping, among other possible treatments.

The comment appears to refer to "risk assessment" in the sense typically used to determine cleanup requirements for closure of an existing hazardous waste disposal site. Because the project has not yet resulted in any environmental contamination and is not expected to produce extensive quantities of waste or other potential environmental contaminants, this type of assessment would be of minimal value for purposes of the EIS. The EIS focuses on effluents directly associated with the production and distribution of medical isotopes and estimates the quantities of radioactive waste that would result. The components of the waste that would be generated during medical isotope production are identified in Section 5.14 of the EIS.

Any radioactive wastes generated by the production of medical isotopes would either be disposed of at a DOE-approved facility within the generation site (in the case of the LANL or INEL alternatives) or shipped to an offsite DOE approved facility (in the case of the SNL/NM and ORNL alternatives). The impacts of waste disposal would be evaluated by a risk analysis for the ultimate disposal facility, in conjunction with other wastes to be managed at the location. Because the medical isotope waste would be a relatively small fraction of the waste disposed at any site, the consequences of such disposal would likewise be small by comparison to the total, or to any regulatory standard.

- 4 The medical isotope production process and wastes resulting from the process are not expected to have any reasonably foreseeable impact on the quality of water in the unconfined aquifer at SNL/NM. There are no discharges to the environment of liquid effluents from the process, and any liquid wastes would be treated and converted to a solid form before disposal. Additional water use by the reactor for cooling represents about 3% of the current water use at SNL/NM. Although withdrawal of this water from the aquifer might have some local effects on groundwater flow, it would not be expected to substantially alter the overall distribution of pre-existing contaminants in the unconfined aquifer or to affect water quality on a larger scale.
- 5 The Department has attempted to actively involve and respond to the public in the NEPA process for the proposed Medical Isotopes Production Project through the public scoping meetings, public comment period, and public hearings held during preparation of the EIS. The Department's public involvement efforts for the proposed project are discussed in Section 1.4. An analysis of environmental justice considerations is provided in Section 5.21.
- 6 Current waste management practices at the alternative sites are described in Section 4, and management of wastes associated with medical isotope production are addressed in Section 5.14 (treatment and disposal of process waste) and Section 5.11 (transportation). As discussed in Section 5.14, solid radioactive or hazardous waste from the process would be stored temporarily at the process facility to permit decay of short-lived radionuclides, following which it could be further compacted to reduce its volume (depending on the waste composition and capabilities of the facility). Liquid wastes would be treated and solidified to immobilize the hazardous components before disposal.

After the decay period and treatment, the wastes would be packaged in appropriate containers for shipment and final disposal. In the LANL and INEL alternatives, the waste would be disposed of onsite, whereas the SNL/NM and ORNL alternatives propose to ship wastes to an offsite disposal facility. All shipping containers would meet applicable DOE or DOT requirements for onsite or offsite transport of radioactive materials, respectively. The final form of the waste and its disposal packaging would be determined by acceptance criteria at the receiving disposal facility. The criteria are designed to ensure that the facility meets applicable regulatory standards for disposal of potentially hazardous materials.

SENATOR JERRY T. TWIGGS
 SENATORIAL OFFICE
 1000 INDEPENDENCE AVENUE, S.W.
 WASHINGTON, D.C. 20540
 TEL: 202/548-2000
 FAX: 202/548-2001
 E-MAIL: JTWIGGS@SEN.Senate.GOV



COMMITTEES
 STATE AFFAIRS
 TRANSPORTATION

PRESIDENT PRO TEMPORE
Idaho State Senate
 SENATOR JERRY T. TWIGGS

January 10, 1996

Honorable Hazel O'Leary
 Secretary of Energy
 1000 Independence Ave., S.W.
 Washington, D.C. 20585

Dear Secretary O'Leary:

The Idaho National Engineering Laboratory's (INEL) Power Burst Facility (PBF) reactor has recently been listed as the potential site of the United States sole source of Molybdenum-99 (Mo-99) isotope production. I believe that the PBF represents the most technologically compatible, economically efficient and environmentally sound facility for domestic Mo-99 production and urge its designation as such.

Idaho is proud that the PBF will soon focus the world's attention on the implementation of Boron Neutron Capture Therapy (BNCT) at the Idaho Brain Tumor Center (IBTC). The technological partnership between DOE and IBTC is a credit to Idaho and the nation. It is my hope the victims whose maladies will be treated here, whether from Idaho, the United States or around the world, will come to understand, as you and I do, the broad advantages to our lives this government/private sector relationship creates.

The production of medical isotopes and the practices of BNCT are technologically compatible projects which can be carried out more efficiently and more cost effectively at the INEL's PBF reactor than at other facilities currently under evaluation by DOE. Both technologies require a constant supply of neutrons and a high flux of neutron. The PBF produces the ideal neutron flux for BNCT and for medical isotope production. Initial engineering studies show that the Idaho PBF facility can be readied for medical isotope production in 6-12 months less time and for \$5 million less than any of the other three facilities being considered for the project.

High product quality and constancy of supply are the two most important ingredients when considering a facility for the production of medical isotopes. The Advanced Test Reactor (ATR), also located at the INEL, has been producing specialty isotopes for many years. The expertise is presently in place to produce isotopes to the highest quality standards. With the PBF serving as the main isotope production facility, the ATR can fill in and maintain a consistent production schedule when the PBF is down for routine maintenance and refueling. Idaho offers a twin reactor concept that insures constancy of supply for many years to come.

Secretary O'Leary
January 10, 1996
Page 2

The U.S. currently has no domestic supply of the most widely used medical isotopes. The Idaho PBF reactor can supply 100% of the domestic demand for Mo-99 and still have excess production capacity for the exportation of Mo-99.

The INEL's PBF reactor is clearly the technologically superior choice for isotope production with minimal environmental consequences. Idaho's long history as the world leader in nuclear materials management makes it ideally suited for the project.

Support for the project both on a local and state level is strong. Downsizing of INEL projects and personnel makes it imperative that new missions are created to save and expand existing capabilities.

DOE intends to privatize the isotope production program. IBTC's present 30 year lease of the PBF reactor puts the privatization plan into effect immediately. No other federal missions will interfere with the operation of Mo-99 production at the PBF, unlike some of the other sites under review.

The humanitarian aspects of the combined National Center for BNCT and the isotope production project makes the INEL's PBF the hands down winner for the nation as well as the State of Idaho.

After considering the lower start-up costs, mission compatibility and technological superiority, it is clear that INEL's PBF is the logical home of the United States Mo-99 production source.

Sincerely,



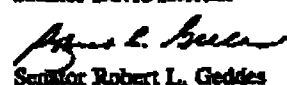
Senator Jerry T. Twiggs
President Pro Tem



Senator Moon Wheeler



Senator David Kerrick



Senator Robert L. Geddes



Senator Robert R. Lee



Senator James E. Risch



Senator Hal Barendsen



Senator John Andreason



Senator Laird Noh



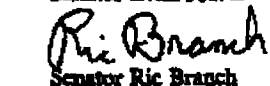
Senator Judith Danielson



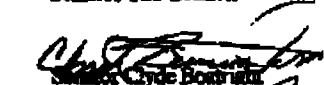
Senator Grant Olsen



Senator Evan Fasure



Senator Ric Branch

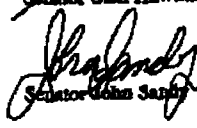


Senator Clyde Bonbright



Senator Mel Richardson

Secretary O'Leary
January 10, 1996
Page 3

 Senator Denton Darrington	 Senator Marguerite McMahon	 Senator Claire Wetherell
 Senator Dean Cameron	 Senator Stan Hawkins	 Senator Rex Furness
 Senator Gordon Crow	 Senator John Jany	 Senator Cecil Ingram
 Senator Lin Whitworth	 Senator John Hansen	

Responses to Comment Letter C037

- 1 Comment noted.
- 2 Comment noted.
- 3 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 4 As shown in Section 5.22, the estimated cost to prepare the INEL facilities is \$2.4 million less than the closest alternative (the preferred alternative), and the estimated time to prepare the INEL facilities for full production is tied with the preferred alternative.

The uncertainties associated with the estimated cost of the INEL and ORNL alternatives are higher than for the LANL and the preferred alternative. Cost estimates (including uncertainties) will be an important factor in determining which alternative to pursue for the proposed project. This comment will be provided to the decision maker for this proposed project and will be given due consideration as the Department formulates its decision on the project. In making its decision, the Department will also consider factors such as the environmental impacts of the alternatives, national need for the medical isotopes, production schedules for each alternative, and other important factors. Since the Power Burst Facility (PBF) is one of the alternatives analyzed in detail, DOE is free to select this alternative to produce Mo-99. The Department's decision will be documented in the Record of Decision.
- 5 The Advanced Test Reactor (ATR) was evaluated for the proposed project and was dismissed for the reasons cited in Section 3.4.1.1. The Department is proposing to establish a backup to the existing Canadian supplier and does not believe that it is necessary to establish a backup to its backup.
- 6 If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. All the alternatives would have the capability to produce at least 100% of the current domestic demand for Mo-99, but the goal of the proposed project is to ensure that a reliable supply of Mo-99 is available to the U.S. medical community, not to produce Mo-99 for export and compete in the worldwide market for Mo-99.
- 7 The IBTC has not made a formal proposal to the Department regarding the dual use of the Power Burst Facility (PBF). Therefore, the Department cannot say for certain whether operation of the PBF would be conducted privately (by IBTC) or by DOE.
- 8 It is possible that the Annular Core Research Reactor (ACRR) could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.
- 9 Comment noted.

William J. Berry
2660 St. Charles Ave.
Idaho Falls, ID 83404
208-523-4183.

Mr. Wade Carroll, MIPP-EIS Document Manager
U. S. Department of Energy
Office of Isotope Production and Distribution, NE-70
19901 Germantown Road
Germantown, MD 20874

February 2, 1996

Dear Mr. Carroll,

Upon further review of the MIPP-EIS copy I was provided at the Idaho Falls hearing, I have the following additional comments.

1 I do not understand the reason research reactors using highly enriched uranium (HEU) would be transition to the use of low-enriched uranium (LEU) fuel. The only possible reason I can think of is that DOE is concerned that using HEU is contrary to supposed Department non-proliferation policies. Whatever the reason for the transition, DOE should perhaps consider that plutonium is unavoidably produced in reactors using LEU and, in fact, is the element responsible for much of the energy at the end of the fuel cycle. Considering that the general public erroneously believes the "sound bite" that plutonium is the most toxic substance known to man, DOE may be faced with a greater problem managing the spent fuel from a reactor using LEU and seems to have little justification for the transition in fuel type.

2 I am also confused as to why low-level wastes (LLW) from the preferred alternative would be transported to the Nevada Test Site (NTS) when LLW from the Omega West Reactor alternative would be managed at Los Alamos National Laboratory (LANL). LANL is much closer to Sandia than the NTS and apparently must have the capability to manage the LLW. Is this a means of avoiding the controversy of transporting the LLW to LANL through Santa Fe? Once again the Power Burst Facility appears to be more favorable than the preferred alternative as offsite transportation of targets and LLW would not be required.

3 The EIS also indicates that DOE prepared an Environmental Assessment (EA) for implementation of the preferred alternative and determined that an EIS was necessary based on the EA and public comments received. The alternatives analysis under the National Environmental Policy Act is intended to be impartial and one might question whether the analysis in the MIPP-EIS met this criterion or, alternatively, if DOE prepared an EIS in support of a predetermined outcome. Several portions of the impact analysis, i.e. those portions where the preferred alternative is clearly not the environmentally preferable alternative, suggest that DOE indeed has a predetermined plan and the EIS was prepared to go through the motions of complying with NEPA.

Please consider these comments in preparation of the Final Environmental Impact Statement.

Sincerely,


William J. Berry

Responses to Comment Letter C038

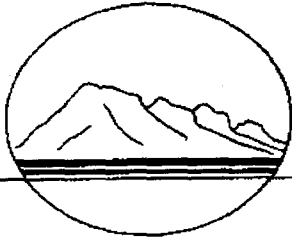
- 1 The commentor correctly points out that plutonium is "unavoidably" produced in reactors using low enriched uranium. The amount of plutonium produced in research reactors, however, is a minor fraction of the amount of fuel used to power those reactors and is nominally less than that needed to produce a nuclear weapon. The amount of highly enriched uranium needed to fuel many research reactors, however, is above the amount needed to fabricate a nuclear weapon. Moreover, use of plutonium in a nuclear weapon would require the extraction of the material from spent fuel through a process known as reprocessing, a complicated procedure. Highly enriched uranium can be used directly in the fabrication of nuclear weapons. It is for these reasons that, since 1978, the United States has sought to minimize and eventually eliminate the international civil commerce in highly enriched uranium. This policy was restated in President Clinton's Nonproliferation and Export Control Policy issued on September 27, 1993.

The majority of foreign research reactors using U.S. enriched fuel have agreed to convert to the use of high density low enriched uranium fuels, developed by the United States as part of the Reduced Enrichment for Research and Test Reactors (RERTR) program. This program is also proceeding with the development of low enriched uranium targets that will enable research reactors to economically produce Mo-99 from low enriched uranium, as opposed to highly enriched uranium, further reducing international commerce in weapons-usable materials. It is expected that the majority of foreign reactors will make use of the new low enriched uranium targets once they become commercially available.

The DOE has over three decades of experience in transporting and storing spent nuclear fuel and targets containing both enriched uranium and plutonium. Several recently completed environmental impact statements verify that the management of these materials can be safely accomplished with only minor environmental impacts.

- 2 The low-level waste disposal facilities at LANL are only approved to dispose of waste generated on the LANL site. They are not able to accept materials from other facilities including other DOE facilities such as SNL/NM. The closest DOE-approved facility able to accept the small amount of low-level waste that would be generated by medical isotope production at SNL/NM is the Nevada Test Site.
- 3 The Department had previously proposed to conduct the Medical Isotopes Production Project using the Chemistry and Metallurgy Research facility at LANL and the Annular Core Research Reactor and Hot Cell Facility at SNL/NM and issued an environmental assessment on this proposal. Based on the environmental assessment and the comments received, the Department decided to prepare an EIS.

The Department has not decided if and where to conduct the proposed project and believes that the EIS provides a fair representation of each alternative from which the decision maker will choose.



FOUR HILLS VILLAGE HOMEOWNERS ASSOCIATION

January 22, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U. S. Department of Energy, NE-70
19901 Germantown Road
Germantown, Maryland 20874

Subject: Medical Isotopes Production Project
Molybdenum-99 and Related Isotopes
Draft Environmental Statement
December 15, 1995

Dear Mr. Carroll,

After careful review of subject EIS, we find no significant impacts or issues associated with the subject program. In fact, we find several positive factors in your choice to locate such a facility at Sandia National Laboratories and Los Alamos National Laboratories. First, the annular core research reactor at Sandia Laboratories is a working reactor. This should mean considerable surety in the cost and schedule estimates over the other possible choices. It also means that this preferred location should get into beneficial production earlier than the other possibilities. This is a very worthwhile goal since the rather old Canadian reactor, producing medical isotopes, could be forced out of service at any time for repairs.

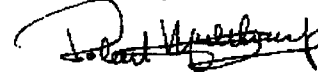
Another positive factor is that this provides an opportunity for the two Laboratories to participate in a commercial operation rather than a military operation and a business that could, in the future, lead to spin-off or associated businesses in the greater Albuquerque area.

I am writing on behalf of the Four Hills Village Homeowners' Association. There are slightly over 1200 homes in Four Hills Village and we are the closest non-military residential neighborhood to the Kirtland Air Force Base and one of the closest residential areas to Sandia's Technical Area V where the reactor and hot cell are located. While the normal business of the Association is delegated to an elected Board of Directors, we were able to put this matter before the entire membership at our Annual Membership meeting on January 11, 1996. I am pleased to report that the general membership unanimously supported the installation of the isotopes production program at Sandia and Los Alamos.

P.O. BOX 13611 • ALBUQUERQUE, NEW MEXICO 87192 - 3611

As one of the most likely impacted neighborhoods, our conclusion that the program offers no significant risk to the public, and the general strong support of the residents of the Village are factors that we hope will be taken into account in DOE's decision on this matter. This is a highly commendable project and we encourage the conversion of the Sandia reactor from a weapons mission to a medical isotopes production mission.

Sincerely,

A handwritten signature in dark ink, appearing to read "Robert H. Multhaup", written over a horizontal line.

Robert H. Multhaup
President

Response to Comment Letter C039

- 1 Comment noted.

GREGORY E. ROMRIELL, D.M.D.

Dear Mr. Carroll,

1 | Regarding the location of medical isotope production facilities, I must press the issue for situating them here. I am a citizen, a rare native resident, who feels that we need a domestic supply of these medical isotopes and welcome their presence in our area. The more strident and shrill voices in our community are those of the Snake River Alliance and friends who hysterically object to anything nuclear! Obviously, none of them has needed the benefit of medical isotopes for diagnosing or treating cancer.

2 | This facility at INEL has been one of the pre-eminent sites for the development of peaceful uses for nuclear energy in the whole world. Taking this project away after the preliminary work has begun would be demoralizing to those who have already invested themselves into it. Please realize that the Snake River alliance crowd does not speak for me, and

4544 YELLOWSTONE CHUBBUCK, IDAHO 83201 TELEPHONE 237-6430

GREGORY E. ROMRIELL, D.M.D.

it does not speak for most people of my acquaintance. Most people are not swayed by the irrational fear mongering promulgated by the media and the nuclear-phobes. We mostly want the availability of these isotopes protected, and we welcome an employer who will provide living wages.

3 | Please keep the medical isotope project at INEL. With the best nuclear physics program and hazardous waste management program here at ISU, we are uniquely and imminently equipped to sustain this type program.

Sincerely,

Leslie Romriell, born and raised in Pocatello

4544 YELLOWSTONE CHUBBUCK, IDAHO 83201 TELEPHONE 237-5430

Responses to Comment Letter C040

- 1 Comment noted.
- 2 The Department has not yet made a decision regarding if and where to conduct the proposed Medical Isotopes Production Project. The Department's decision on this project will not impact the other isotope production activities that are currently conducted at the INEL.
- 3 The proposed Medical Isotopes Production Project would be a new project and is not currently being conducted at the INEL. As stated above, the Department has not yet made a decision regarding if and where to conduct the project, and the Department's decision on this project will not impact the other isotope production activities that are currently conducted at the INEL.

Wade Carroll
U.S. Dept. of Energy

Jan. 20, 1996

Dear Mr. Carroll,

1 We are writing to you to express our support for making our INEL site into a Treatment Center for Brain Tumors, their therapy and Isotope Production for such care.

The facility here between Blackfoot, where we live, and Arco, is a Superior Area and we urge you to seriously consider and approve this site in Idaho for the much needed medical facility.

2 Not only will it be a great and desperately needed service for those with brain tumors, etc, but it will also enable our area to benefit with the needed jobs and funds.

Thank you,

Don & Elaine Mangum

We do have an increasing number of brain tumors here and need this facility in our area

Responses to Comment Letter C041

- 1 Comment noted.
- 2 The EIS evaluates the potential impacts of the proposed Medical Isotopes Production Project at various alternative sites, including the INEL. Possible treatment facilities that might operate concurrently yet independently of the Mo-99 mission (such as boron neutron capture therapy) are not part of the Department's proposed action or stated purpose and need.

questions by.

1/26/96

341 Lounis Ave

Paul Kasten, ORNL retiree, UT adjunct professor

012 TN 37830

423-483-5250

Specific evaluation of many factors were performed, concerning environmental factors, times to production (initial and full), reactor capacity factors, storage capabilities, etc. Also, a recommendation was made on the preferred alternative facility for Tc^{99m} production. But the process for evaluating the ~~process~~ ranking of alternative facilities was not given. ~~What~~ Were there specific criteria used in the evaluation, and what weighting were they given? What was the basis for the weighting factors? Seems as if what was done was to conclude ~~off~~ all factors were a "wash" except for the time to initial, limited production. I hope this the final statement will specifically give the criteria and weighting factors. ~~to~~ Please comment on the above.

2nd question

Who will make the final decision, and will it be a Technical or a political decision?

Responses to Comment Letter C042

- 1 The criteria for identifying the reasonable alternatives are presented in Section 3.1. Each of the criteria had to be met before a facility was considered to be a reasonable alternative. No weighting factors were applied to the criteria.

The reasons for identifying the preferred alternative are presented in Section 3.3.1.1.

- 2 In addition to the analyses contained in this EIS, the Department will consider other programmatic factors, as appropriate, in making its decision on the proposed production of Mo-99. The rationale for the Department's decision will be documented in a Record of Decision that will be issued following completion of the Final EIS. The Record of Decision will be signed by either the Secretary of Energy or the Director of the Office of Nuclear Energy, Science and Technology.

COMMENT

ON THE
U.S. DEPARTMENT OF ENERGY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE
MEDICAL ISOTOPES PRODUCTION PROJECT

PLEASE PRINT CLEARLY

NAME: Uri Gat
STREET ADDRESS: 239 Gum Hollow Road
CITY Oak Ridge STATE Tn ZIP CODE: 37830
TELEPHONE: 423-483-7609 work: 423-514-0860

COMMENT: A new project is required to use SI
Specifically: Ru-86; Sr-89; Cs-137 and I-131

SIGNATURE

DATE

Uri Gat
1996-01-25

Response to Comment Letter C043

- 1 Comment noted; changes have been incorporated throughout the document as appropriate.

COMMENT

ON THE
U.S. DEPARTMENT OF ENERGY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE
MEDICAL ISOTOPES PRODUCTION PROJECT

PLEASE PRINT CLEARLY

NAME: Robin Seydel
STREET ADDRESS: 1940 Poplar Ln SW.
CITY: ABQ STATE: NM ZIP CODE: 87105
TELEPHONE: (W) 265-4631 (H) 242-6134

COMMENT:

At the evening session -
Scientists made presentations
to the public. It is imperative
to have scientists work on
DOE program - scientists that
represent a community - view
to participate on the presentation
panels - a more balanced
and understandable information
on these issues of tremendous
impact to the health and
well being of our communities

SIGNATURE
DATE

Robin Seydel
11/30/96

Response to Comment C044

- 1 The purpose of the public hearings is to present the results of the environmental analysis to the public and to obtain public comments on the content of the Draft EIS.

Moly 99 hearing comments

As a citizen living in Albuquerque, and a representative of the Water Information Network, I would like to make comments on the public health factor of having a nuclear reactor running 24 hours a day near our city of 800,000 people, and the financial costs of this project to taxpayers.

1 You may remember that back in December of 1994, a DOE spokesman, Dr. Charles Massey, actually said that operation of the isotope reactor will definitely "add unfortunately" to the background level of radiation in our environment here in Albuquerque. The Environmental Impact Statement also confirms this and states there are already 8 other hazardous sources of radionuclide pollutants at the Kirtland AFB/Sandia National Lab complex.

Living near the lab, I find this extremely alarming. The Albuquerque area has a high level of radioactivity from past above ground nuclear weapons tests, accidental nuclear reactor leaks, undocumented accidents with lab plutonium, and leaks into the ground.

2 Before a decision can be reached, there must be more discussion of possible ill-health effect and the nuclear waste that will be generated if this project is allowed to happen. SNL has no authority for permanent storage or disposal of radioactive wastes, LLW or spent fuel on site.

3 Nuclear waste will therefore be shipped through our city of Albuquerque, and destined for Nevada. Let us discuss the radioactive materials transportation route and identify communities at risk from potential transport related impacts. Have there been contacts made with local governments and community organizations along those routes? Travel in or out of SNL requires transit through residential neighborhoods along Gibson, Wyoming, Eubank Boulevards, or, Broadway south of Rio Bravo if the Kirtland Base south exit is to be used. Have the communities been told of this potential risk? Have any contacts with residents or their representatives been made?

4 | The Moly 99 EIS fails to effectively implement both the spirit and letter of the Federal Executive Order on Environmental Justice and fails to recognize the diversity of the communities in close proximity to identified sites and indicates no effort to directly involve those communities in project-related planning, assessment or any form of direct dialogue or communication .

5 | I call for a full EIS to be done including an assessment of toxic chemicals found in Albuquerque known to synergistically react with radioactivity and therefore weaken our resistance to other diseases.

5 | We citizens are not ignorant of the fact that toxic chemicals are being released into our air and water with Intel releases, increased air operations at the expanded airport, and past hazardous incidents at Kirtland AFB/Sandia NL.

6 | My primary concern is for the people living in the Albuquerque area, yet another reason to stop this program is that citizens tax dollars will be used to subsidize Moly 99 production. This is simply corporate welfare. SNL and the UNM School of Pharmacy plan to operate this nuclear reactor for a private firm. This publicly owned reactor would produce medical isotopes which would be sold by a private pharmaceutical supply company to hospitals. Hospitals could then charge our insurance company's a substantial price for the DOE/UNM isotopes. Taxpayers will also pick-up research and liability costs for accidents at the nuclear reactor. It is very convenient that a private company can escape liability when a government agency is involved as a partner. The start-up cost of this project is \$34 million and an additional cost of \$12 million per year. In this time of social program cuts, I don't feel this is the proper use of our tax dollars.

7 | But as I have already stated, money isn't my main concern , It is the health of those of us living here.

7 | The citizens of Albuquerque and Isleta Pueblo have fought against radioactivity being dumped in our sewer system. We certainly do not want radioactivity released into our air either.

8 | A 1994 study of Bernalillo County white female breast cancer deaths, by epidemiologist Jay M. Gould, found a 26.7% mortality increase over the past 30 years. Gould says New Mexico has the highest, 31% increase of any state in the Union. Interestingly, the DOE chooses not to recognize the Gould research nor his conclusion.

9 | Besides being corporate welfare, this project is great PR for the labs. Sandia NL can now state how wonderful they are in helping the health of citizens, while making them ill in the first place by their continuing nuclear weapons work, the real reason for the labs existence. We are not fooled by this PR campaign, as you bring up medical doctors to site the needs for Moly 99. The supply from Canada is not a problem, that is a false statement.

10 | I do not want a nuclear reactor running 24 hours a day, with a possibility of an accident occurring. The reactor in Canada has been sited 150 miles away from Ottawa, while here in Albuquerque the reactor, presently shut down, but proposed to open, is in our backyard.

Once again, I demand a comprehensive EIS on the cumulative and synergistic effects of possible radiation exposure combined with the toxic releases already being emitted in Bernalillo County.

*Susan Diane
Water Information
Network
POB 4524
Alamy NM
87106
255-4072*

Responses to Comment Letter C045

- 1 The EIS is required to consider the cumulative impacts of the proposed action with other ongoing or anticipated actions at the candidate sites, and it does so in Section 5.16. With respect to radiological air quality, the proposed action plus the other activities at SNL/NM would result in a dose of 0.17 mrem to the most exposed individual. This is less than 2% of the EPA standard for radionuclide emissions from DOE facilities (10 mrem/year).

If the proposed action were implemented, the collective dose to the population within 50 miles of SNL/NM would increase by less than 0.01% compared to that from background radiation. This small increase from normal operation of the isotope production facilities, or from any reasonably foreseeable accidents, would not be expected to measurably increase the risk of cancer fatality experienced by the 610,000 residents living in the vicinity of the laboratory.

- 2 SNL/NM and ORNL do not have the capability of "cradle to grave" waste management and will require low-level waste be shipped to the Nevada Test Site. As discussed in Section 5.14 of the EIS, the quantities of waste generated from production of Mo-99 are small and thus would dovetail into each sites' established waste management programs with little impact. All alternatives considered have sufficient onsite spent nuclear fuel (SNF) storage capabilities to operate at 100% U.S. demand for at least 5 years. Analysis in the SNF Programmatic EIS (SNF PEIS) has shown that there will be minimal impacts from such interim storage. Long-term disposition of SNF will be in accordance with the Department's decision for the SNF PEIS.
- 3 Any shipments of radioactive material that might occur as a result of DOE implementing the Medical Isotopes Production Project at SNL/NM would be conducted in accordance with Federal and state standards for transportation of radioactive materials. Transportation routes would be chosen according to established guidelines to minimize risk to workers and the population along the corridor. Appropriate planning for routing of these shipments and contingencies for emergency response in cooperation with state, local and tribal governments would be in place prior to removing these materials from the SNL/NM site.
- 4 The purpose of Section 5.21 is to identify the potential for disproportionately high and adverse effects on minority and low income communities. Census blocks generally follow recognizable groups of residences within existing urban boundaries and recognizable boundaries in rural areas. For purposes of estimating impacts on humans from environmental contamination, distance and direction from the source of contamination are the factors that matter. Thus, populations were examined based on distance and direction out to a radius of 80 km (50 miles) to take in all of the area most likely to be affected by an airborne release at each site. In examining the locations of low-income and minority households, Section 5.21 indicates that under some adverse atmospheric conditions, low-income and minority households could be disproportionately affected in a worst-case accidental release, although the effect in each case is expected to be minimal. However, under prevailing atmospheric conditions, higher income, non-minority populations would be most affected.

The Department has attempted to actively involve and respond to the public in the NEPA process for the proposed Medical Isotopes Production Project through the public scoping meetings, public comment period, and public hearings held during preparation of the EIS. The Department's public involvement efforts for the proposed project are discussed in Section 1.4. An analysis of environmental justice considerations is provided in Section 5.21.

- 5 The EIS identifies the anticipated impacts from the proposed Mo-99 project at each of the alternative sites. Additionally, it evaluates the cumulative impacts at each alternative site from the proposed project.
- 6 The Department has proposed the Medical Isotopes Production Project to ensure that a reliable supply of Mo-99 is available to the U.S. medical community. If the Department decides to pursue this project, the Mo-99 would be sold at prevailing world market rates. DOE does not intend to artificially lower the cost paid by pharmaceutical companies for Mo-99 and would thus not artificially increase the profits realized by these companies on sales of Mo-99. Therefore, the Department believes that it would be incorrect to label isotope production by the Department as a subsidy to private industry or "corporate welfare."

If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage. The goal of the proposed project is to ensure that a supply of Mo-99 is readily available to the U.S. medical community.

As stated in the EIS, DOE supports the production of Mo-99 by private industry. If a private company begins reliably producing Mo-99 in the U.S., DOE will phase out its production of Mo-99.

- 7 The potential impacts of radioactive releases from the proposed Medical Isotopes Production Project, which are analyzed in Section 5, would be unlikely to result in any health effects to the surrounding population.
- 8 The implication that New Mexico has higher rates of breast or other cancers than other areas appears to be unfounded. In fact, the total cancer death rates in New Mexico are lower than all but two other states. Both the overall cancer rates and breast cancer deaths in New Mexico are well below the national average, and they are also lower than those of either Idaho or Tennessee (the other two potentially affected states in the EIS alternatives).

Reference: American Cancer Society, 1994. "Cancer Facts and Figures 1994," American Cancer Society, Atlanta, Georgia.

- 9 The problem with the Mo-99 supply situation is not that the supply is from Canada (or from any other foreign country, for that matter). The problem is that the entire U.S. supply comes from a single source. It should also be noted that this single source accounts for about 85% of the world supply of Mo-99. If this source were to become unavailable, production facilities in other countries would most likely focus on meeting their own needs first and, in any case, would not be able to meet even half of U.S. demand for Mo-99. Given this supply situation, the Department has proposed establishing a domestic production source to ensure that a reliable supply of Mo-99 is available to the U.S. medical community.
- 10 Comment noted. However, the reactor in Albuquerque is not shut down, but is currently operational.

Kenneth D. Dobbin
1843 Blue Heron
West Richland, WA. 99363

February 8, 1998

Mr. Wade Carroll
EIS Project Manager
Office of Nuclear Energy, Science
and Technology (NE-70)
U. S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874-1290

Dear Sir:

The "Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes Draft Environmental Impact Statement" (EIS) is seriously flawed in three areas, which I must bring to your attention. This EIS does not adequately consider a single-point failure, does not provide a realistic analysis of the continuous production requirement, and does not adequately investigate less expensive alternatives.

Selection of only one alternative leaves no backup when a catastrophic failure occurs. The EIS states that the Canadian supply will be shut down near the end of the century with no certainty of replacement and that European suppliers are too far away and cannot produce adequate quantities. Therefore, two domestic reactors must be considered to assure a supply of Mo-99.

None of alternatives alone, when closely scrutinized, can satisfy the continuous production requirement, that reactor outages will be less than six days. The only way to satisfy that requirement is to have two reactors, also satisfying the first concern, mentioned above.

The EIS dismissed, prematurely, the lowest cost option. The Fast Flux Test Facility (FFTF), located in Washington State, is being considered to produce tritium. The tritium mission would in essence pay for the reactor that could provide low cost Mo-99 simultaneously. These missions are complimentary and provide a synergism that the EIS ignored. The FFTF is the newest and safest of all the Department of Energy (DOE) reactors and has 22-30 years of life left. Analyses show that the FFTF is the cheapest source of tritium that will pass the scrutiny of the public and is likely to be selected for that mission. The FFTF should be selected as a second, low cost Mo-99 producer that would satisfy both concerns mentioned above.

3

One additional benefit of the FFTF is that a private consortium will likely operate the facility. Advanced Nuclear and Medical Systems (ANMS) has given the DOE a proposal to privatize the FFTF. This would satisfy the DOE's long-term goal, stated in the EIS summary, of private sector domestic production of Mo-99.

Please consider repairing these flaws before the final EIS is issued.

Sincerely,

Kenneth D. Dobbin

Kenneth D. Dobbin

cc: Senator Slade Gorton
Senator Patty Murray
Congressman Doc Hastings

Responses to Comment Letter C046

- 1 The Department is not proposing to replace the Canadian reactor. Instead, the Department is proposing to establish a backup to the Canadian reactor. If the DOE decides to pursue this project, it will operate its Mo-99 facilities at full production capability only in the event of a Mo-99 supply shortage. Each of the alternative reactors has the capability to keep reactor outages to less than six days.

At this time, it appears that the Canadians will ultimately build two new reactors for Mo-99 production. If it becomes apparent that the Canadians are going to be unable to build even one new production reactor, DOE will assess the world supply situation at that point and may investigate the possibility of establishing further production capability.

- 2 The Department is conducting a study of the viability of the Fast Flux Test Facility (FFTF) for tritium production, but no decision has been made. The FFTF cannot produce 100% of the U.S. demand for Mo-99 on a continuous basis for the reasons cited in Section 3.4 and therefore has been dismissed from consideration for this project.

Regarding the issue of FFTF as a backup source of Mo-99, the Department is proposing to establish a backup to the existing Canadian supplier and would not desire to establish backup to this backup.

- 3 As discussed in Section 3.4, the FFTF cannot meet the selection criteria for a Mo-99 production facility. If the FFTF is restarted in response to the proposal from Advanced Nuclear and Medical Systems (ANMS), the private consortium may wish to produce Mo-99 in FFTF. In such case, DOE would review its Mo-99 production plans and modify them if appropriate, recognizing that FFTF cannot provide a continuous supply of Mo-99.



HEALTH PHYSICS SOCIETY

PRESIDENT (1994-1996)
 PRESIDENT (1996-1998)
 PRESIDENT (1998-1999)
WILLIAM A. MILLS
 9815 Adelphi Lane
 Chevy MD 20832
 Telephone: (301) 774-6028
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 E-mail: wamills@po.com

2 February 1996

Mr. Wade Carroll
 EIS Project Manager
 NE-70
 U. S. Department of Energy
 19901 Germantown Road
 Germantown, MD 20874-1290

RE: Medical Isotopes Production Project

Dear Mr. Carroll:

The Health Physics Society strongly supports securing a reliable source of molybdenum-99 (Mo-99) in the United States.

Mo-99 is the source, by radioactive decay of technetium-99m (Tc-99m), the short-lived radionuclide of choice for tens of thousands of daily nuclear medicine procedures conducted in the United States.

The sole current source for Mo-99 is an aging, 40-year-old Canadian nuclear reactor, whose future life is limited; and there is no viable alternative available to the medical community. To assure the continued availability of Mo-99, it is essential that the United States take steps to establish its own secure domestic source. Therefore, we are most supportive of the current activity of the Congress and the Department of Energy to follow its Environmental Impact Statement with expeditious implementation of the development of the facility necessary to produce a secure supply of this uniquely valuable medical tool.

The Health Physics Society is an organization of over 6,400 scientists and other professionals who are dedicated to the safe and beneficial use of radiation.

Sincerely,

William A. Mills
 President

WAM:al

Response to Comment Letter C047

- 1 Comment noted.

**ON THE
U.S. DEPARTMENT OF ENERGY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE
MEDICAL ISOTOPES PRODUCTION PROJECT**

NAME: with held
STREET ADDRESS: _____
CITY _____ STATE _____ ZIP CODE: _____
TELEPHONE: _____

COMMENT: See attached

SIGNATURE _____
DATE 2/2/96

Comments

Draft Environmental Impact Statement for Medical Isotopes Production Project

In attending the afternoon session of the public meetings held in Albuquerque, NM, I felt compelled to comment on some of the comments I heard from representatives of the intervenor groups that were present.

1. The issue of the government subsidizing this program is not appropriate or applicable to an EIS. This policy issue is one for the US Congress and these people have the same access to that forum as any citizen in the US, so their continual harping on this non-environmental issue demonstrates their inability to take their baseless complaints to the correct authorities. The reason these comments should be dismissed by the DOE are:

a. If the project is undertaken by private commercial interests the ENVIRONMENTAL IMPACTS WOULD BE THE SAME. Therefore, the comment is useless for completion of the EIS. It simply does not matter whose name is on the front door, the risks, environmental issues, waste issues, etc. would be the same.

b. The Federal government subsidizes many American industries so that the products are cheaper to individuals within our society. This means that we all pay a small amount of money via taxes to enjoy some individual reduction in cost of the products such as milk, beef, tobacco, utilities, timber, railroads, home mortgages, and on and on. Therefore, the concept of government subsidies to industry and citizens is wide-spread and well accepted in the USA. If they believe this is such a problem, then the issue is MUCH BIGGER than the medical isotopes project. However, they only seem to bring it up against industries and projects they do not like. They do not seem to object to tourism, agricultural, or medical subsidies from which they personally may want to benefit.

c. The alleged amount of the subsidy (which may not even occur if the going price is high enough) is insignificant--\$12 million dollars is less than a \$1.00 per person, so we are not talking about a major debt issue. I think we would also like to have these medical therapies available at a cheaper cost as a society. If the private sector is left in charge--especially the current situation where one company holds a monopoly on production--the cost can become enormous. Then you guessed it--the taxpayer will subsidize the treatment at the other end through medicare, medicaid, a whole host of federal subsidy programs, and through increased cost in our private insurance (our employers will pay more too, reducing their ability to pay us more). So, the taxpayer will PAY ANYWAY, whether it is up front at production, or at the end through medical programs--especially the one these intervenors suggested--a NATIONAL HEALTH CARE SYSTEM which will cost all of us a ton of money through taxes or payroll losses. These people really do not understand economics, but even if they did, such policy issues are not relevant topics of an EIS.

d. The statement that New Mexicans will not have access to the medical benefits of this program is ludicrous. If you are poor in this state, you go to UNM hospital and receive any necessary medical treatment, including these therapies. And surprise, surprise, who pays the bill--the TAXPAYER. This false statement is aimed at fanning emotions of

uneducated people. If SWOP, SWRIC, and the Physicians groups really want to help poor New Mexicans (and I hope they would not discriminate against those who have white skin) they should provide them with information about the services that are available instead of making false statements in public EIS meetings.

c. The physicians group is really hypocritical, in that they as a profession will certainly receive full and HIGH reimbursement for these medical therapies, mostly through government subsidy. How can they care if the subsidy occurs at the beginning or end of the process since they would never consider waiving their fees?

2. As to the issue of public participation—the previous EA effort and this EIS has had more public participation than any NEPA document I have seen at DOE. Just because the intervenors lie, bring up non-related issues, and use the press for their money-raising efforts, does not mean that relevant comments have not been addressed. They need an enemy to justify their existence. Their comments on lack of public participation are false and again irrelevant to approval of this document and this project. They always make this comment when they simply have no rational technical issue to bring up.

3. NTS has plenty of technical capability to receive the small quantities of radioactive waste this project will generate. The NIMBYs of NV create political barriers, just as they do in New Mexico, but there is certainly no technical issues related to waste disposal at the NTS site. If the intervenors object to the transportation and removal of the waste to NTS, perhaps they would support development of a disposal site in NM. It is clearly feasible and can be technically controlled quite well. In fact, it could become an incredible opportunity for New Mexico to develop high paying jobs (versus minimum wage tourism-related jobs) and economic development if we built a disposal site here and would help NM make a positive contribution to the national welfare. Capacity of waste disposal sites again is not an issue for this EIS.

4. As to New Mexico dealing with the consequences of being a producer of these isotopes (dealing with the waste issues, etc.) I am a native New Mexican—born and lived in this State all of my life—and I would be very proud to have this process/facility in my state, making such an important contribution to the health care of this county and, yes, even the world, if possible. New Mexico has benefited tremendously from the DOE and national lab facilities present in this state—in fact we would probably be the 50th state in the nation for income, health care, and every other positive rating scale for life without these facilities. The benefits have far outweighed any negative consequences of having these facilities in our state. We depend entirely on the rest of the country to provide us with most of the goods and services we consume because we produce and export so little. It is time for New Mexico to begin to recognize that making a positive contribution to the country and to ourselves means using the facilities and residents of the state (all races, colors, creeds) to meet national policy objectives, including medical isotopes, radioactive waste disposal (a natural for a state with low population densities and the tremendous technical expertise available in NM), technology transfer, etc. Our assets include a large unpopulated land base, access to cutting edge research and technology, strong history in the atomic energy area, and facilities that are available for transition from nuclear bomb

research to peace time use of these materials to benefit mankind. If we/they do not agree with national policy, then we/they should go to Congress to make changes and stop harassing the Federal agencies and employees who are simply doing their best to implement the jobs assigned to them by the President and/or Congress. I object to any insinuation by these people, that NM should or even could isolate itself and survive as a separate political/economic entity. If US policies are so bad, why are so many people trying to come here to live?

3 | In order to positively respond to these comments, I expect the DOE to expeditiously approve the EIS, approve the project plans for this project at the preferred and/or feasible location, and get Mo-99 into production in this country, preferably in New Mexico. There are a lot of silent citizens who would approve of this action and who do not believe or even understand the objections of the small number of minority intervenors who seem to oppose everything and never provide any positive solutions to the problems they so vocally introduce. The conclusion of the HIN is clear: **THERE ARE NO SIGNIFICANT ENVIRONMENTAL IMPACTS IN THE CONSUMMATION OF THIS PROJECT AT SANDIA NATIONAL LABORATORIES.**

Responses to Comment Letter C048

- 1 Comment noted. The Department's public involvement efforts for the proposed project are discussed in Section 1.4.
- 2 The commentor is correct in identifying that both the preferred alternative and the ORNL alternative would require some shipment of low-level waste to the Nevada Test Site (NTS). The NTS is preparing a site-wide environmental impact statement and has included waste generated from the proposed Medical Isotopes Production Project in the quantities and description of materials to be disposed of on the site.
- 3 Comment noted.

298 Call Avenue
Idaho Falls, Idaho 83402
Sunday, February 04, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U.S. Department of Energy
Office of Isotope Production and Distribution, NE-70
19901 Germantown Road
Germantown, Maryland 20874

Subject: Comments on the Draft Environment Impact Statement
for the Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes

Dear Mr. Carroll:

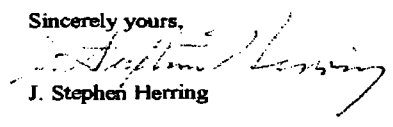
After reviewing the Draft Environmental Impact Statement on the production of Mo-99 and attending both of the Idaho Falls hearings on the DEIS, I have the following comments:

1. It was unclear from the presentation at the hearing and from the document what the criteria actually resulted in the ACRR being chosen the preferred alternative. At the hearing, when asked this question, you stated that the time to initial production of Mo-99 was the deciding factor. Certainly cost and ultimate production capacity were not the deciding factors, since the PBF is superior to the ACRR in both of these categories.
2. Many of us having experience in the restart of reactors would seriously challenge the estimate that the ACRR could be capable of initial production of Mo-99 within 12 months. If it is to use modified TRIGA fuel and a modified core design, then a longer time would be required for safety analyses and environmental documentation.
3. Defense Programs would retain the option for reclaiming the use the ACRR from the production of Mo-99 whenever it is deemed necessary for national security. This retained option on the part of Defense Programs would seem to be a great obstacle in attracting private investment to the further production of Mo-99.
4. The quality of the cost estimates for PBF production was questioned in the document and at the hearing. However, it was acknowledged that the correspondents at the PBF provided all data requested. In order that a fair comparison between the alternatives be made, it is vital that the cost comparisons be made in equal detail.
5. The use of the PBF for Mo-99 production is complementary with its use for Boron Neutron Capture Therapy (BNCT). I have contacted the group designing the BNCT treatment procedures and found that the reactor could be used simultaneously for the production of Mo-99 and for BNCT treatment. The simultaneous use of the reactor for these two purposes is an attribute that none of the other alternatives possess.

I agree with the DEIS in that it indicates that there are no significant environmental reasons for choosing one option (e.g. the ACRR) over another (e.g. PBF).

Because of the cost advantages for the PBF as shown in the DEIS and because of the possibility for simultaneous Mo-99 production and BNCT treatment in the PBF, I think that it is imperative that the designation of the ACRR as the preferred alternative be reconsidered.

Sincerely yours,


J. Stephen Herring

Responses to Comment Letter C049

- 1 The Annular Core Research Reactor/Hot Cell Facility (ACRR/HCF) combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.
- 2 The ACRR is currently operational and, if selected for the project, would run for a period of time using its current fuel. The target to be irradiated can be placed in a vacant fuel location if the central core modifications are not complete, thereby completely obviating the need to modify the reactor for this low-level production period. The current hot cells would be modified to be capable of processing a limited number of targets. This can be completed within six months to a year.

Routine production would require the full reactor modifications, including completion of all the safety analysis submittal and completion of an operational readiness evaluation. This would require the full 28 months to complete.

- 3 It is possible that the ACRR, the preferred reactor for the proposed project, could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration. This low probability need is not believed to significantly reduce the preferred alternative's potential for privatization.
- 4 The Department has used the best available information for all of its analyses and comparisons, including the cost information. Information on restart of the Power Burst Facility (PBF) was fairly thorough and was probably a result of the efforts to estimate costs and schedules for conversion of the PBF for boron neutron capture therapy (BNCT). However, reactor conversion and operation is only a portion of the cost and schedule information requested. Hot cell modification, process line fabrication, target fabrication facility modification, and general processing operational costs also are reflected in Section 5.22 of the EIS. Additional information on the estimated cost of the INEL alternative was obtained subsequent to the publication of the Draft EIS and was used in the preparation of the Final EIS; however, the amount of supporting material associated with these estimates was less detailed than that received from some of the other sites. Thus the Final EIS contains statements that indicate that the margin of error for both the INEL and ORNL estimates are considered larger than those for LANL and SNL/NM.
- 5 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for BNCT and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 6 Comment noted.

Dear Mr. Carroll,

About ten years ago my Mother was diagnosed with having rectal cancer. At that time a treatment facility was not available around the Idaho Falls area, therefore leaving her no alternative but to have the treatments administered in Salt Lake City, Utah which was the closest facility at that time.

Her treatment consisted of double doses of radiation and chemo-therapy over a seven week period. She became very ill and required constant care and bed rest, therefore requiring that she remain in a facility in Salt Lake City. There was no option for coming home for periods of time and then returning for her treatments, she had to stay there virtually alone for the entire seven week period.

There were times when family members could stay with her for a few days, however with all of us working and having commitments to our own families we could not be with her as much as was needed because of the location. She had to depend on a nurse at the facility, a complete stranger, to tend to her needs, this was very uncomfortable for her and us. This was a devastating experience for the entire family. At a time when my Mother needed her family so desperately we were unable to help her.

If there had been a treatment facility closer to Idaho Falls my Mother would not have been alone during that frightening time when she needed so very much to be at home. We could have been there to help and give her support through a potentially life threatening experience. I pray to God this never happens again.

1 | It is my opinion that having a treatment facility at the INEL is an absolute necessity. There are many people who could benefit from this life saving service. If one life is saved, if a family can be there to help and support their loved one and if that person can remain in their own home after each treatment, these are the strongest justifications needed for this type of facility. It is so very important to have your family with you during a time of such uncertainty, sickness and fear, everyone deserves that right!

Yours truly,



Debby S. Christensen
CRC Idaho Inc.

Response to Comment Letter C050

- 1 The EIS evaluates the potential impacts of the proposed Medical Isotopes Production Project at various alternatives including the INEL. Possible treatment facilities that might operate concurrently yet independently of the Mo-99 mission (such as boron neutron capture therapy) are not part of the Department's proposed action or stated purpose and need.

b.l.a.s.t.

bueno los alamos surveillance team

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general secretary
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el prado, n.m. 87529
505-776-1658

February 1, 1996
Arroyo Hondo, NM

ditto nowakoski
executive video producer
p o box 6390
taos, n.m. 87571
505-758-8195

Hoody Folks,

These are comments on your Medical Isotopes Production Project:
Molybdenum-99 and Related Isotopes Draft EIS DOE/EIS 02402

Section 6.0 Regulatory Framework mentions Floodplains and Wetlands, and we want to know how many acres of wetlands and floodplain will be impacted 1. in construction, 2. by operation, 3. by runoff, 4. by catching downwind contamination, 5. by waste storage and 6. by transportation. This same list of questions should also be applied to lands protected by Native American, Archaeological, and Historic Preservation Laws; as well as habitat protected by the Endangered Species Act, Migratory Bird Treaty and ~~End~~ Protection ~~Act~~ Eagle Act. Under each alternative, that is, of course. (And at each location.)

Obviously the optimistic title of Table B-6 is true that if and when there is Routine or Incident-free Transportation, which must mean accident-free, there will be no fatalities, but then there are days and there are accidents. All the technically disinformation on potential for serious accidents mirrors the delusion represented by so many Environmental Impact Statements. Can the preparers and the decision makers be sued by the victims of any such improbable act?

True Fiction seems to be the genre of the need and purpose segments, too. With downsizing the government and privatization, one must remember that credibility counts! If there were truly a need would private industry not leap at the opportunity? Is not this another plot to keep great funds into DOE budget accounts? Why does it seem like a good excuse to keep Y-12 live and kicking? How will the end products be marketed? Does DOE have other cottage industries? Please name and explain how the other DOE owned interstate commerce operations work and for whom? Both Y-12 and LANL's CME buildings should be sealed in cement and used as monuments to the trillions of our national resources dumped into destruction. Probably the other sites you intend to use come under the previous comment, but I don't know.

Since LANL is under contract with the University of California, and may continue under their management or other, but the Oak Ridge and ~~Hanford~~ ^{Idaho} plants have other managers... How will management operations and revenue of this business enterprise work?

Oops, that's INEL & NTS

Technology changes so quickly and we need to know whether this one might be outdated before it earns back the taxpayers investment? How long will it take to earn back that investment. We do presume that this will be a fundraiser for the coffers according to your best possible spin on the scam? Do you have detailed prognostications on the financial future? Economic impacts should include supplies plus transportation plus waste management plus overhead and should exceed projected income enough to pay off the construction costs. As well as the common interpretation of the impact on the local communities.

~~XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX~~

We currently have on hand an EA for Proposed CMR Building Upgrades. If this proposed alternative is approved, will it upset or alter the CMR Proposal? How do these two parallel documents intermesh, or do they? Were they ~~not~~ planned to compliment each other or is this one an excuse to support that one since the CMR Bldg. is seriously outdated and dangerous?

With the cold war's mythological end, of course it is an improvement to see DOE moving toward public health projects. We thought, perhaps there are other people in DOE now doing research to find new technology to replace radioisotope methods. Often with health things, the public pays for government research and development and some private company makes the big profits. But, is there not some kind of new laser imaging in the works? How many years will be until a new mode and method will replace radioisotopes? And, how big a gamble is it to put such a large investment into an antiquated and contaminated facility?

We want to know how the implementation of this program will impact the Reconfiguration FEIS, the Waste Management FEIS, the Site E Wide FEIS for each Lab involved, the CMR Upgrade, and each and all other studies and plans which will be altered to accommodate it? Will any of these studies need to be amended? If so which ones and please include all details in the final EIS.

Pollution problems must be thoroughly addressed too! Safe disposal of both waste and the used isotopes need clear definition and plan beyond the waste produced by the operation of the program. If you are going to but these toxins into medical communities all over the country, you must help plan for safe and secure disposal of them too. Do you have any plans to recycle the used targets? Are any such disposal programs now being used under the supervision of your department?

We love you, and we love our earth home
and all her precious creatures,
In light and peace,

bonne benne
bonnie bonneau

ditto nowakoska

Responses to Comment Letter C051

- 1 The total area disturbed by proposed additions or modifications to any facility at the alternative sites would be much less than 1 acre (see Section 5.2). All activities described in the EIS would utilize existing facilities or would occur in previously developed areas at these sites. None of these activities would occur in areas designated as wetlands or floodplains, nor would they occur in locations or facilities that have been identified as having resources of ecological, historical, archeological, or cultural significance. If such resources were discovered during the course of implementing the project, activities would cease and appropriate agencies would be consulted to ensure that their ecological, historical, archeological, or cultural value would be preserved.

Likewise, routine operations, waste management, and transportation would involve only existing or currently planned facilities and infrastructure at the alternative sites. Therefore, no impacts on sensitive ecological habitats or on historical, archeological, or cultural resources would be anticipated. Environmental contamination resulting from medical isotope production activities would be minimal and would comply with all applicable regulations governing facility operation, transportation, and waste management to ensure protection of the public and the environment.

- 2 The fatalities referred to in Table B-8 result from vehicle emissions that would occur even in the absence of any accidents (see the text of Section B.1.2.2). Some of these impacts would occur even in the absence of the need to transport medical isotopes (scheduled air carrier activity, for example). The transportation accident analysis used region-specific statistics for traffic and aircraft incidents, as well as the probability of harm to the public from such incidents, and they represent the best information currently available on the risks of such events.

The risks, as well as the benefits, to the public associated with transporting medical isotopes will be taken into account by DOE in its final decision on whether to implement the project, and at which site, if any, it should be located. The possibility of legal action and the probability of such an action by a member of the public would certainly depend on the circumstances of the event and are not within the scope of environmental impacts considered in this EIS.

- 3 The Department would prefer that the private sector assume responsibility for ensuring that a reliable supply of Mo-99 is available to the U.S. medical community; however, private industry has thus far been unwilling to do so. Therefore, DOE has proposed to conduct the Medical Isotopes Production Project. If private industry is able to ensure a reliable supply of Mo-99 on its own, the Department would phase out its production activities.

One of the charters of the Department of Energy is to produce and make available radioactive isotopes for medical and scientific purposes utilizing the Department's extensive scientific and technical capabilities and facilities. At present, the U.S. is totally dependent on foreign sources of Mo-99, the radioactive parent of the important medical isotope Tc-99m. A prolonged interruption in Mo-99 supply would make it impossible to conduct the more than 30 different types of diagnostic examinations that rely on Tc-99m-based radiopharmaceuticals. These examinations are conducted about 36,000 times each day in the U.S. and include bone and liver scans for cancer detection, kidney function tests, brain scans, and a variety of other clinical tests. The inability to conduct these diagnostic procedures could seriously impact the health and well-being of U.S. citizens in need of these diagnostic procedures. In addition, the practice of nuclear medicine represents a sizeable part of the U.S. health care industry. Thousands of jobs could be jeopardized by an interruption in the supply of Mo-99.

The importance of the supply of Mo-99 to the U.S. medical community was highlighted by a position statement submitted to the Department of Energy by the Society of Nuclear Medicine and the American College of Nuclear Physicians. These organizations stated, "it is particularly urgent that the U.S. Government work to establish a reliable, uninterrupted supply of Mo-99 as the source of Tc-99m, the main radioactive isotope used in diagnostic nuclear medicine." The petition further stated, "the United States cannot remain vulnerable to foreign crisis and inadequate backup supplies."

The Department has proposed the Medical Isotopes Production Project to ensure that a reliable supply of Mo-99 is available to the U.S. medical community. If the Department decides to pursue this project, the Mo-99 produced would be sold at prevailing world market rates. DOE does not intend to artificially lower the cost paid by pharmaceutical companies for Mo-99 and would thus not artificially increase the profits realized by these companies on sales of Mo-99. Therefore, it would be incorrect to label isotope production by the Department as a subsidy to private industry or "corporate welfare."

If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage. The goal of the proposed project is to ensure that a supply of Mo-99 is readily available to the U.S. medical community.

The Mo-99 and related medical isotopes would be marketed through the Department's Isotope Production and Distribution Program and would be sold to intermediaries (e.g., radiopharmaceutical companies) or end users as appropriate.

- 4 The ORNL and the INEL are managed and operated for the Department by Lockheed-Martin Incorporated. The Nevada Test Site is managed and operated for the Department by Bechtel Corporation. If the Department decides to pursue this project, the management and operating contractor at each involved site will conduct the actual production operations (including waste management), and the Department will fund and oversee the contractor activities.

Revenues generated from the sale of medical isotopes would be realized by the Department's Isotope Production and Distribution program, which would use the funds to offset the operating costs of the medical isotope production facilities.

- 5 If the Department decides to pursue this project, the amount of revenue generated by the proposed project would depend on both the quantity of isotopes sold and the market price of those isotopes. Compatible projects may also be found that could use the capability of the production facilities and thereby help offset costs. Based solely on Mo-99 production, a facility would have to sell in the range of 30% to 40% of the U.S. demand for Mo-99 to cover annual operating costs. If less Mo-99 is sold, DOE will provide funding to maintain operations at the minimum required level. Current projections are that the Mo-99 market will grow at a rate of 5% to 10% per year for the foreseeable future.

The socioeconomic impacts of the proposed project are discussed in Section 5.3 of the EIS.

- 6 As discussed in Section 1.6, the two documents are not interdependent and were not planned to either complement or support each other. The upgrades to the Chemistry and Metallurgy Research facility are independent of the Mo-99 production process.
- 7 The Department has considered a variety of non-reactor-based sources for substitutes to Tc-99m. However, none of these potential options are either mature enough technologies or could become readily available in the near term. Initiation of the Department's proposed action is not intended to discourage or deter continued development of new long-term options for production of Mo-99 or alternative technologies to the use of Tc-99m.
- 8 Section 1.6 of the EIS describes the relationship of the Mo-99 EIS to other DOE NEPA documents. The only document that will require modification is the Nevada Test Site (NTS) site-wide EIS. The NTS is preparing a site-wide environmental impact statement and has included waste generated from the Mo-99 mission in the quantities and description of materials to be stored on the site.
- 9 All of the major potential sources of pollution associated with facility operations to produce 100% of the current U.S. demand for Mo-99 have been considered in Section 5 of the EIS. Any radioactive wastes generated by the production of medical isotopes would either be disposed of at a DOE-approved facility within the generation site (in the LANL or INEL alternatives) or shipped to an offsite DOE-approved facility (in the SNL/NM and ORNL alternatives). The impacts of waste disposal would be evaluated by a risk analysis for the ultimate disposal facility, in conjunction with other wastes to be managed at the location. Because the medical isotope waste would be a relatively small fraction of the waste disposed at any site, the consequences of such disposal would likely be small by comparison to the total or to any regulatory standard.

The small quantities of radioactive waste generated by the end users (hospitals and medical clinics) would be disposed of according to the arrangements currently in place by those users. It should be emphasized that these users are currently receiving and using Tc-99m generators in their operations and that under the actions proposed in the EIS, only the source of the isotope could change. The types and quantities of isotopes used in medical procedures by these institutions would remain the same as their current practices under any alternative, unless the current Canadian supplier ceased production and no backup supply were available.

Management of radioactive material by commercial institutions, including the pharmaceutical manufacturers, medical isotope end users, and commercial radioactive waste disposal facilities, is regulated by the Nuclear Regulatory Commission (NRC). The end users typically return spent Tc-99m generators to the pharmaceutical manufacturers, where the nonradioactive components are recycled. The activity level of the residual radioactive material remaining in the generators would be very low because the Tc-99m rapidly decays to Tc-99, which has a long radioactive half-life (216,000 years) and thus a low activity level. This waste would be disposed of, along with other radioactive wastes generated by the pharmaceutical companies, in an NRC-licensed radioactive waste facility. Any NRC-licensed commercial radioactive waste disposal facility must undergo a NEPA review similar to this EIS before construction, and it must meet all NRC standards for licensing, operation, and decommissioning of the facility during its life cycle.

At present, the stainless steel target shells would not be recycled unless new technology developments made it practical or possible to do so. Activation of the stainless steel during irradiation in the reactor would make the material difficult to handle without incurring excessive worker exposure. These shells would be compacted to the extent possible at each particular site and ultimately disposed of as radioactive waste. The enriched uranium target could be recycled from the process waste stream using a procedure developed by DOE, and such recycling would occur under at least one of the EIS alternatives.

85 Claymore Lane
Oak Ridge, TN 37830
February 7, 1996

To: Mr. Wade Carroll, EIS Project Manager
US DOE, NE-70, 19901 Germantown Rd.
Germantown, MD 20874-1290
From: Barbara A. Walton (423) 482-5652
Subject: Draft Environmental Impact Statement (EIS), Medical Isotopes Production
Project: Molybdenum-99 and Related Isotopes, December 1995

I commend the DOE for its responsiveness to the scoping meeting held in July and for getting the subject document to me by the start of the public comment period, so I could read it prior to the public meeting held January 25, 1996.

My review of the subject document reveals several deficiencies:

1. The month of January is missing from Tables D-2, D-3 and D-4.
2. On page 4.57, the first sentence of section 4.3.7 is completely wrong; the reference, Culp, concerns Sandia not Oak Ridge.
3. The availability factor was given near the bottom of page 3.41 for the Oak Ridge Research Reactor; it should also be given for the other alternatives. This is especially of interest for all alternatives that require modification; the outage duration should also be given for these cases.
4. Costs for the INEL reactor core modification (see top of p. 5.101) should be included as well as costs for expansion of spent nuclear fuel storage from 300 to 1000 elements for SNL/NM-ACRR.
5. Uncertainties about costs should be bounded if possible; these should also include factors such as lack of experience and the use of burst reactors in steady state.
6. The schedule given on Table 3-2 should also indicate the level of production (as % of US demand) for those timeframes of less than full production.
7. The impact of any DOD use of the ACRR (p. 3.26) on meeting DOE goals should be more completely addressed.
8. The time required for FDA licensing should be included in the schedules.

I am very concerned that this document puts forward a preferred alternative, which is the most expensive of the four capable of meeting the DOE goal as stated on p. v. This is not justified by environmental consequences (p. xii), schedule, or technology, as presented in this document. The Oak Ridge alternative is best suited on the basis of being designed to do this type of production with all the needed facilities in close proximity and a reactor designed to operate in a continuous mode (compare resources required for modification, Table 5-47). Costs should be computed on a life-cycle basis and Section 5.22 expanded. At a time when the government is cutting back on many fronts and trying to balance the federal budget, it is imperative to give a greater emphasis to costs in the decision making process.

Barbara A. Walton

Responses to Comment Letter C052

- 1 Data for the month of January were not available; however, the EIS has been changed to reflect the correct reference as indicated in the commentor's second comment (see Section 4.3.7).
- 2 Because of the differences in design and mission, availability factors cannot be directly compared. For instance, both the Power Burst Facility (PBF) and the Annular Core Research Reactor (ACRR) were designed as burst experimental facilities. Significant periods of time (weeks, perhaps months) are required to develop and install a given experiment. During this development and modification/installation period, the facility is not available, nor is it needed, for operation. This would lead to both a poor availability factor and capacity factor, even if the facility had a perfect operating record with no unplanned shutdowns.

Outage durations also cannot be directly compared. Again, a facility whose mission is routine weekly operation with a 1-day refueling cannot be fairly compared to facilities whose mission is to develop, install, and conduct complex experiments requiring weeks of down time.

For these reasons, the durations were not given for other facilities. However, the EIS does mention in Section 3.3.2.4 that the Omega West Reactor had a forced outage rate of less than 2%. Both this and the availability factor of the Oak Ridge Research Reactor were salient attributes regarding the quality and reliability of the facilities.

- 3 The costs of the INEL reactor core modifications were not available at the time the Draft EIS was issued, but have now been included in Section 5.22 of the Final EIS.

The cost of upgrading the SNL/NM storage pool was not included in the estimate because in a backup role until Maple I and II are constructed, 300 bundles would easily serve as adequate spent fuel storage. It can store the fuel from 6 years of full production operation. The DOE objective is not to engage in full production and compete with the Canadian supplier, but rather to fill in the gap if the Canadian supplier fails for some reason.

- 4 The Department described the estimated costs and schedules in Section 5.22 of the EIS. The figures provided are based upon the best available data; where the uncertainty of the numbers was considered to be greater than for the other alternatives, the EIS notes it.

Factors such as operational history are mentioned in the EIS. Two of the reactors considered have operated in "burst" mode. The ACRR has operated in this mode for most of its operational history. The PBF reactor also has operated in burst mode for much of its history, but has operated successfully at steady state for extended periods of time.

- 5 During the startup periods, it is anticipated that only enough targets will be irradiated and processed to demonstrate to the Food and Drug Administration the capability of the facilities to produce Mo-99 consistently. This could be as few as a target every few weeks. The objective would be to have the capability of continuously producing approximately 10% of U.S. Mo-99 demand during this period, with an emergency supply capability of approximately 30% of the U.S. demand for Mo-99. There is no interest in a move to full production as long as the Nordion supply is stable.

- 6 ACRR is an Office of Defense Programs facility within DOE. The possible diversion of the ACRR for defense use is highlighted in the EIS because in an emergency, the ACRR is more likely than the other reactors considered in the EIS to be used for defense purposes. However, the DOE has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.
- 7 The schedules presented in the EIS include the anticipated FDA approval times.
- 8 The ACRR/Hot Cell Facility combination at SNL/NM is the preferred alternative for target irradiation and processing for reasons stated in Section 3.3.1.1.
- 9 In the EIS, the Department has evaluated factors such as resources required for modification (Section 5.13) and compatibility of facilities with the proposed project (in Section 3.3).
- 10 The costs for the modification of facilities and facility operations are presented in Table 5-1 and Table 5-52. An analysis of these costs and the projected revenues specific to this proposed project will be evaluated for each alternative as information for the Record of Decision process. Since each alternative proposes the use of existing facilities and the Department is already responsible for facility-related costs, such as facility decommissioning, an incremental cost analysis (rather than a life-cycle cost analysis) was considered appropriate information for the decision-making process for the proposed project.

COMMENT

ON THE
U.S. DEPARTMENT OF ENERGY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE
MEDICAL ISOTOPES PRODUCTION PROJECT

PLEASE PRINT CLEARLY

NAME DAVID TRACY
STREET ADDRESS 3708 CHERAZ
CITY ALBUQUERQUE STATE NEW MEXICO ZIP CODE 87111
TELEPHONE: (505)275-6145

COMMENT:

Formal Comments on draft Environmental Impact Statement titled: Medical Isotope Production Project: Molybdenum-99 and Related Isotopes

1 - No where is there input from the Canadian government or from the Canadian company currently manufacturing Moly 99 that states "they" are dropping out of Moly 99 Production in Year 2000. If those letters exist then they must be in the EIS. The whole premise of this EIS is that Canada and its company want out--if they don't then stop this effort!

2 - Page XI, Table S-1, "Alternatives considered But Dismissed". Some alternatives are dismissed primarily due to "not meeting near term goals for Moly 99 production". This appears self-serving for Sandia Labs particularly if Canada and its company hasn't provided written confirmation of dropping out of Moly 99 Production in Year 2000. You must really
3 address in the EIS why "near term goals are needed", what they really mean to users of Moly 99 and allow the private business sector to provide individual input to EIS.

4 - Page B.21 - "Integrated population risk assessment B.1.3.1 statement", and Para 4, states "accidents on the road are difficult to eliminate" and "only a relatively small fraction of accidents involve conditions that are severe enough to result in a release of radioactive materials" and Page B-22 accident frequency - states - "the conditional probabilities of encountering accident conditions in each severity category were taken from a NRC document (Fischer et al, 1987". This EIS must include real data on nuclear shipments via air, vehicle, river and rail in the US. Moly 99 is going to be distributed everywhere and the distribution system one is set from Canada and started prior to EIS(s) being required. Utilizing data from

SIGNATURE David Tracy
DATE 6 Feb 96

4 the Fischer 1987 study, which is almost 10 years out of date, seems questionable. The world has changed, nuclear transportation technologies changed, laws and rules changed, needs changed and technology conditions have changed dramatically. Based on this, you must add and update transportation data and utilizing up-to-date severity categories or do a separate EIS.

5 - At no time does this EIS address the new use of 11 million gallons of water required from rare water resources below Albuquerque and Kirtland. This EIS should contain input from both entities as to what the loss of 11 million gallons a year means to them. Also, this EIS should address how much water will be returned, in what condition, and how. this is a real environmental concern and must be addressed. The paragraphs in page 4.11 to 4-13, 5.9 don't even attempt to address this issue--just quality and barely.

6 - Page XXXV "Acronyms and Abbreviations" and pages XVII to XXV "Contents" don't address a real critical issue that of NAFTA. Even para 4.1.3 "Social Economic Environment" don't address this critical and political treaty. Canada is one of the signatory countries and this is taking business away from them and permitting US Government (DOE) and its contractor (SNL) to take it away from Canada and (its private company). You MUST address this issue as NAFTA concerns government -vs- private enterprise and government investment into private enterprise. Insist you get the Department of Commerce (DOC) provide a letter to include in the EIS that states this proposal doesn't violate NAFTA. Also, request you include a paragraph in 6.0 "Regulatory Framework" on NAFTA compliance.

7 - Insist that you definitely describe the safety/transportation/public health plans for the selected Sandia National Labs alternative - provide real draft plans to include starting out at Sandia Labs level then Albuquerque level then New Mexico level and then nationwide. This is a totally new distribution system and must be included in the EIS.

8 - Insist you add a paragraph on water management in chapter 6.0 "Regulatory management". It should thoroughly address removal of water from the Albuquerque and Kirtland aquifer, waste water return and cite the regulatory documents utilized.

9 - concerning "near term goals for Moly 99 production" in Table S-1, Page XI - insist you include in EIS what the goals are, why, and their impact on private sector, US Government and NAFTA.

10 - Reference. Page IV "Who has Produced Molybdenum-99" and "How Molybdenum-99 is produced". If Oakridge stopped producing Moly 99 in deference to US commercial sources in 1966, which is a good reason, then has DOE offered to share the Lintichen Process (which it owns) with US industry? Insist you explain why in EIS and if not why not? Who has DOE offered it to in US business community? When? and Why they refused. Also insist that EIS "fully"explain all the accepted Processes to produce Moly 99? Who has them? Rank order the processes. This issue is totally unexplained technically, economically and commercially.

Responses to Comment Letter C053

- 1 The Department has not received, nor does it expect to receive, written notice from Nordion International or the Canadian government stating that they may not be a reliable supplier of Mo-99 in the future. (See letter from Nordion International-C068.)

The Department has proposed to establish a backup capability in case the Canadian supply becomes unavailable. It should be noted that the entire U.S. supply and about 85% of the world supply of Mo-99 comes from this single Canadian source. If this source were to become unavailable, production facilities in other countries would most likely focus on meeting their own needs first and, in any case, would not be able to meet even half of U.S. demand for Mo-99. Therefore, the Department has proposed to establish a domestic production source to ensure that a reliable supply of Mo-99 is available to the U.S. medical community.

- 2 As stated above, the U.S. is entirely dependent on a single reactor in Canada for its entire supply of Mo-99. It is this near term "window of vulnerability" to which the Department proposes to respond. Therefore, options that could not provide the capability to produce 100% of the U.S. demand in the next few years were not considered in detail. SNL/NM was not responsible for making this decision.
- 3 The need for a near-term backup supply of Mo-99 is addressed above. The private sector, including isotope producers, distributors, and users, has been given an opportunity to comment on the proposed action and the Draft EIS.
- 4 Based upon the lack of changes to cask design or shielding requirements since the Fischer et al. (1987) document and analyses, the Department determined that use of this reference is appropriate.
- 5 The total water use from operation of the Annular Core Research Reactor at SNL/NM would increase from the current average of 5000 gal/day to 29,000 gal/day, compared to total water use at SNL/NM of 1,000,000 gal/day (Section 4.1.13) or total water use in the Albuquerque region of 90,000,000 gal/day. This represents less than a 3% increase in water use at SNL/NM, or 0.03% increase in water use for the region, and would not be expected to substantially impact availability or quality of water in the aquifer.
- 6 The problem with the Mo-99 supply situation is not that the supply is from Canada (or from any other foreign country, for that matter). The problem is that the entire U.S. supply comes from a single source. Since the Department would operate its facility as a backup to the existing Canadian supplier, the production project would not be in competition with the Canadian company and would not be in violation of the North American Free Trade Agreement.
- 7 The EIS is one of a series of safety, environmental, and health assessments that would be required before the medical isotopes project could proceed. After the decision is made as to whether and where to implement the project, detailed engineering designs would be prepared, and safety, security, and operational readiness reviews would be conducted before and during actual operations. In addition, any facilities and operations proposed by the project would be included in the host site's emergency preparedness plans, and each would be subjected to permitting reviews by state and Federal regulatory agencies.

The transportation analysis includes evaluation of the routine and accident consequences associated with distribution networks at each of the alternative sites. As with facility siting, preparation of detailed and specific

plans for emergency response associated with transportation would be premature until the actual transportation modes and routes are identified.

- 8 Water use is discussed in Sections 5.13 and 5.16 in relation to the total usage at SNL/NM, and disposal and treatment of wastewater is discussed in Section 6.18, which cites the applicable regulatory standards. No routine liquid effluents other than normal sanitary waste would be expected from the project, and any liquid wastes containing radioactive or hazardous materials would be treated and solidified before being disposed of in a DOE-approved disposal facility.
- 9 The near-term goal, as stated in the EIS, is to provide the capability to produce 100% of the U.S. demand for Mo-99 in case of a supply shortage. DOE has also stated in the EIS that it would operate as a backup and would phase out production if the private sector begins reliably producing Mo-99, so there is no anticipated impact on private industry or the North American Free Trade Agreement.
- 10 When Cintichem Corp. decided to withdraw from the Mo-99 production and supply market, it advertised the availability of the rights to the Cintichem process. Cintichem received no interest from the U.S. private sector. Since DOE has had the rights to the process, it has not formally offered the Cintichem process to private industry, but industry is aware that the Department has it and would be willing to license it to private industry. To date, industry has not been interested because the process requires the fission of uranium in a nuclear reactor and, at current market rates for Mo-99, industry would not be able to operate a privately owned reactor and sell Mo-99 at a profit.

There are currently only two FDA-approved processes for producing Mo-99 for use in the U.S. They are the AECL/Nordion process and the Cintichem process. Both are capable of producing quality product. The principal drawback of the Nordion process is the relative quantity of liquid waste produced. The Cintichem process is discussed in Section 3.1.2 and Appendix A of the EIS. The Nordion process is proprietary, so the details of the process are not available to the Department.

3136 Sandstone Drive
Idaho Falls, ID 83404
January 24, 1996

Mr. Wade Carroll
MIPP EIS Document Manager
Office of Nuclear Energy
Science and Technology (NE-70)
U. S. Department of Energy
19901 Germantown Road
Germantown, MD 20874

Dear Mr. Carroll:

As a resident of Eastern Idaho, I fully support the use of the Power Burst Facility at the Idaho National Engineering Laboratory (INEL) as the preferred site for providing a reliable supply of molybdenum-99 and related medical isotopes.

I am a native of Eastern Idaho and have lived around the INEL all my life. I truly believe that the site has operated in a safe manner for years and every care is taken to protect the environment and people. In addition, I would like to see this facility/reactor, which my tax dollars helped build, put to good use rather than dismantled.

I believe that the INEL would be the best site for this project and know that this would be an excellent use of the existing technology and facilities.

Sincerely,

M. Ilene McKnight

Response to Comment Letter C054

- 1 Comment noted.

To: Wade Carroll
U. S. DOE
Office of Isotope Production
NE-70
19901 Germantown Rd.
Germantown, MD 20872

From: Greg Gerber
1945 1st Street
Idaho Falls, Id
83401-4308

Sir,

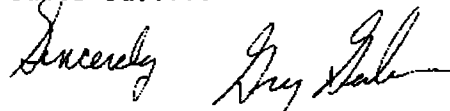
Thank you for letting me participate in the recent meeting you held in Idaho Falls. I feel you need to address and answer the following items in the final EIS.

1. You need to explain where, how, and by which Organization that 11.5 million dollars has already been spent on ACRR. If its as I suspect, the money was spent doing the same Analysis, Reports, Safety Analysis Reports, Environmental Assessments, Environmental Evaluations, and various other required documentation. If any of the other Facilities had this money they also might have been the preferred site for Moly-99 production. This 11.5 million dollars give the ACRR an unfair advantage. This money should have been added to the cost of the ACRR to relate its true cost. I won't buy that this money was spent on research and development. This production of Moly-99 is a proven process with proven techniques. To the public, it appears that this money was spent under the table to bring Moly-99 production to ACRR with no Public input. And now DOE is trying to justify bringing Moly-99 to ACRR since the DOE already spent the money there. Not fair or ethical. Whatever facility gets this project, let it be for the right reasons--Technical capability and cost to the taxpayer.

2. Although necessary SAR reviews are include in the cost estimates I feel the ACRR SAR review budget is much to low. With each type of Core refuel with different types of HEU and LEU fuel will require the necessary(required) change in the SAR documentation. It will also require the necessary physics testing after changeout of each different type. This is an added cost and was not mentioned or discussed in this document.

3. Although at any of the sites in the report their is a very small risk of a Reactor Accident, some weight must be given to how far each Site is located away from large population centers. ACRR is located 1 1/2 to 3 1/2 miles from the outskirts of a very large city. It would seem to me that the farther a facility is away from a large population center the better it would seem the the general public.

4. Another matter of cost is not mentioned here. Although full time employees and budgets are mentioned for all sites, no mention of labor rates is given. Is some weight given to the Site with the lowest labor rate???

Sincerely, 

Responses to Comment Letter C055

- 1 Any funds previously spent on the Annular Core Research Reactor are not relevant to a choice among alternative facilities for decisions concerning future program activity. Only the investment requirements and operations expenditures following a Record of Decision are relevant for the purposes of the EIS. The EIS provides estimates of the remaining costs to complete and operate the proposed Medical Isotopes Production Project at each of the sites. A more complete description of the EIS cost estimate assumptions and past expenditures has been added to Section 5.22.
- 2 The costs associated with modification or restart of potential medical isotope project facilities were obtained from the alternative sites to the extent possible, and they represent the best information available when the EIS was prepared. In some cases, the costs to bring safety documentation up to date take into account work that was accomplished for other purposes prior to preparation of the EIS and therefore represent incremental expenses necessary to complete work on the safety analysis report (SAR) updates.

All of the reactors would operate initially using existing fuel stockpiles and would not undertake core reconfigurations to convert to other fuel types until some time in the future, if it were necessary to do so at all. In such cases, the SAR updates accompanying the reconfiguration effort would be completed in conjunction with ongoing reactor operations and would not necessarily add to the cost of reactor operations during that time.

- 3 The accident analysis in Section 5.15 accounts for the size and relative distances to major population centers in calculating the dose and risk of fatal cancer in the surrounding population. For example, the population dose from isotope production operations at INEL and LANL, which have relatively small and remote surrounding populations, is lower than that for SNL/NM and ORNL, where the population centers are larger and nearer to the site. The resulting risks to the population for latent fatal cancers also reflect these differences, although the risks at any site would be small.
- 4 Labor rates did factor into the cost figures presented at each alternative. Some of the differences shown in Section 5.22 for each of the alternatives are directly attributable to the variations in labor rates.

COMMENTS ON DOE/EIS-0249D
MEDICAL ISOTOPES PRODUCTION PROJECT:
MOLYBDENUM-99 AND RELATED ISOTOPES

Robert D. Ulrich
1254 Zener
Pocatello, Idaho 83201

1. Page viii: The statement that no private company is available in the near future to take on Mo-99 production is not quite correct. It is my understanding that the Idaho Brain Tumor Center (IBTC) group has proposed a joint venture to DOE for the use of PBF as both Mo-99 production and treatment of cancer (BNCT) part of this proposal was to privatize the Mo-99 production. This action would eliminate all but the start up costs for DOE future Mo-99 production would be at IBTC expense not DOE's.
2. Page 3.48 The statement about PBF holding 19 targets may or may not be correct when drawn out it looks more like 24 or 25 targets would fit, the space would be 8.25" in diameter, not 6" as stated in option 1. Also the PBF reactor can accept targets greater in length up to 48", it seems this would greatly increase the capacity of production. If all three options were used PBF could produce more Mo-99 than would be required for several years use.
3. Page 3.50 I am uncertain about which modification to the PBF reactor are being referred to (3.3.4.9) the only mods required would be a target holder, mods would be needed for BNCT but these would be paid for by the IBCT people and would be done around the Mo-99 schedule.
4. Page 3.51 The statement that shipments from PBF to the hot cells would travel on US 26 is incorrect it is actually Idaho 33 instead, also the traffic figures for that highway include much of the onsite traffic since this road runs through the site and is the only way to get from the south end of the site to the north end.
5. Page 4.5 Looking at the Maps on page 4.4 it appears that the ACRR is located within a very short distance of a major population area, where as PBF is more isolated, the nearest town (population of about 15) being 7 miles away, with a town of 1200 being 25 miles away and to reach greater pop. would have to go 42 miles to Blackfoot. Idaho Falls is even further.
6. Page 4.8 It appears from statements on this page that ACRR is directly on several major faults, if one of these caused a problem once again the supply of Mo-99 would be in jeopardy. True PBF is located in the inter-mountain west which has some seismic activity, and several faults are close, but to my knowledge it is not sitting directly on a fault.

7. Page 4.89 The table showing highway traffic on state route 33 does not mention much of this traffic shown is associated with the INEL since this route passes through the INEL and is the only route from north to south on the site.
8. Page 5.66 5.15.4.2 the statement that PBF and the Omega West Reactor are similar is wrong, the only way they are similar is that they are both reactors. Omega West is fuel with MTR plate type fuel constructed of aluminum, whereas PBF is fuel is made of Zirconium Oxide clad with Stainless Steel. Omega West fuel has a fairly low melting point as opposed to that of PBF which is in excess of 2500 degrees C. After all PBF was designed to test reactor fuels in the test space without incurring core fuel damage. It has been shown in various reports that the PBF fuel should never melt, the aluminum support structure would melt first, but even this should not endanger the fuel integrity, PBF is probably the most stable reactor ever built any where in the world.
9. Page 5.101 I am not sure what mods are being referred to, the only mods needed would be for BNCT and would be funded by them not DOE.
10. There are numerous references in this document stating the costs estimate given for PBF could be greatly higher than stated, due to lack of time to prepare, I don't think so these numbers have been gone over and over the last several years as different parties have done estimates for the conversion of PBF for BNCT.
11. There as several places mentioning that low waste generated at ACRR would have to be shipped to the Nevada Test Site, PBF does not have this problem our waste would be stored at the INEL.
12. Page 5.38 5.14.4 It appears from statements in this EIS that PBF is better equipped to handle and store spent fuel generated during Mo-99 production.
13. I was unable to find any reference to where ACRR gets it water supply, is its supply limited as is the case in most of the southwest or is like PBF's and comes from a mostly inexhaustible supply.
14. It is clear that the only logical choice from a technical and cost basis is the site the Mo-99 production at the PBF in conjunction with BNCT, this would not only reduce start-up costs but would totally eliminate operating costs for future production, it would also eliminate shipping waste off site for storage since the INEL can do it all.

Thank you for your time and consideration of these points.



Robert D. Ulrich

Responses to Comment Letter C056

- 1 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received and the Department proceeds with the action proposed in this EIS, the Department would seek privatization proposals on a competitive basis.

- 2 The 6-inch diameter is a typographical error and was corrected in Section 3.3.4.4 of the EIS. Using a standard geometric spacing configuration to attempt to keep the thermalization of neutrons consistent among the targets would presage a 37-target arrangement (rather than the suggested 24 or 25 targets) as the next step beyond the 19-target configuration. An adequate water space between the targets is required for both cooling and moderation.

Target length has little to do with production. Most cores could accommodate targets with greater than 18 inches of active material length. Target power level dictates the production rate. The concern is possessing hot cell facilities capable of handling targets that have been irradiated for a week at slightly greater than 20 kW. After a 6-day irradiation followed by a 6-hour cooling period, a single 20 kW target contains about 35,000 curies of activity. Three targets (the typical number anticipated to be shipped to the Test Area North [TAN] annex) would contain over 100,000 curies of activity. Hot cell walls 50 inches thick (2.35 gms/cm³ or greater) with windows and manipulators designed for that level of curie content are required. This quality of hot cell is not commonplace. Lengthening the targets to 36 inches of active material length would basically double the hot cell curie requirements. No available hot cells at the INEL possess 200,000+ curie ratings.

It should be recognized that all the considered facilities are capable of producing greater than the current domestic industry demand.

- 3 Besides modifying the central cavity, which is a significant modification, the reactor control system would need to be modified for a continued steady state, non-pulse mode. The transient rods would need to be removed and fixtures for target irradiation placed in the vacant locations. Cooling flow to the central cavity would need to be appropriately established along with the normal core cooling flow in lieu of the contained loop that currently exists. Flow balance valves for the central irradiation cavity would have to be designed and installed to assure that appropriate target cooling flow is established without flow-induced vibration of the targets occurring. The core would need to be redesigned to supply a hardened spectrum of neutrons to the central irradiation cavity. Concentration of the power to the core center would be needed to establish the appropriate flux levels without needing to operate the reactor above 10 MW to make the facility competitive regarding fuel utilization.

- 4 Section 3.3.4.9 of the EIS was changed to correctly identify the proposed route.
- 5 The observations listed in the comment are substantially correct. The benefits of locating the facilities in a remote location are reflected in lower radiological consequences for normal operation and accidents at the facilities.
- 6 The geologic features of the Albuquerque area, including faults and other seismic hazards, are reflected in requirements for building construction in this region. The design criteria for facilities at the SNL/NM are consistent with the Uniform Building Code 2B seismic hazard of the area. Building codes for the other alternative sites likewise reflect the relative seismic hazards associated with those locations.
- 7 Section 4.4.11.1 mentions that State Route 33 passes through the northern portion of the INEL and provides access to the northern INEL site facilities. The comment is also true regarding highways 20 and 26. Most of the traffic on these roads is also associated with site activities.
- 8 The statement in Section 5.15.4.2 refers to the fact that the design basis accident scenarios for each reactor are similar. The technical basis of the comment is substantially correct. The EIS attempted, to the extent possible, to utilize existing safety documentation and other analyses in developing accident scenarios that would represent the design basis accidents for facilities considered in the Medical Isotopes Production Project. However, the Power Burst Facility (PBF) safety analysis report (SAR) is outdated and does not contain sufficient information on radiological emissions associated with the design basis accidents evaluated in the document. Based on information contained in the PBF SAR, a coolant flow blockage in the core leading to overheating and fuel element damage was included as a credible design basis accident. This is similar to the type of accident evaluated for the Omega West Reactor (OWR) and for which a radionuclide release estimate was available. Therefore, the OWR release estimate was used to evaluate a similar accident at the PBF and also at the Oak Ridge Research Reactor in the absence of more recent analyses specific to those facilities. The release estimates were combined with site- and facility-specific information (stack parameters, meteorology, and location with respect to potential receptors) to estimate the consequences to workers and the public from these accidents.

In addition, the estimated radionuclide releases for fuel damage scenarios (from whatever cause) at OWR and ACRR were similar, and use of the OWR scenario to represent emissions from an accident at the PBF should bound the consequences of a design basis accident at that facility. Assuming a lower release or accident frequency based on the thermal characteristics of PBF fuel might result in a lower risk estimate; however, this would not likely change the conclusions reached in the EIS because the accident risk associated with operation of any of the facilities is low.

Also, the idea that the fuel at the PBF will not melt until $>2500^{\circ}\text{C}$ is achieved is not correct. The fuel meat (without fuel clad and liner) in a crucible will not melt until about 2500°C . This is also true of all the other uranium-oxide-fueled facilities, which is all of the reactors considered. The PBF fuel is stainless clad, zirconium-calcium cladding lined, uranium oxide-zirconium-calcium mix pellets. Uranium oxide melts at 2600°C , stainless steel melts at 1400°C , and zirconium melts at 1852°C . During the fuel rod melting process, a eutectic is formed between the uranium oxide fuel and the cladding, be it zirconium or stainless steel, causing a greatly reduced melting temperature of the combined metals. The reason for this phenomenon is similar to the reason that solder melts at temperatures much lower than that of either tin or lead.

If the interface between the cladding liner and the cladding reaches 1400°C , the fuel rod cladding will begin to melt; the cladding will melt more rapidly if a eutectic forms and the melting point drops to much less than

1400°C. The zirconium-calcium clad liner should assuage this problem somewhat. Something similar will probably happen between the liner and fuel meat. It is true that the PBF fuel has a higher melting point than the aluminum clad OWR fuel. However, the OWR fuel, without cladding, in a crucible would not melt until 2600°C is achieved, slightly higher than the PBF.

- 9 As discussed in Section 3.3.4.9, several modifications would be required to conduct medical isotope production. Besides modifying the central cavity, which is a significant modification, the reactor control system would need to be modified for a continued steady state, non-pulse mode. The transient rods would need to be removed and fixtures for target irradiation placed in the vacant locations. All material removed from the central cavity would require disposal, a legacy waste cost and man-hour/man rem cost. Legacy disposal costs are involved in the transient rods and mechanisms. Cooling flow to the central cavity would need to be appropriately established along with the normal core cooling flow in lieu of the contained loop that currently exists. Flow balance valves for the central irradiation cavity would have to be designed and installed to assure that appropriate target cooling flow is established without flow-induced vibration of the targets occurring. The core would need to be redesigned to supply a hardened spectrum of neutrons to the central irradiation cavity. Concentration of the power to the core center would be needed to establish the appropriate flux levels without needing to operate the reactor above 10 MW to make the facility competitive regarding fuel utilization.
- 10 The Department has used the best available information for all of its analyses and comparisons, including the cost information. Information on restart of the PBF was fairly thorough and was probably a result of the efforts to estimate costs and schedules for conversion of the PBF for BNCT. However, reactor conversion and operation is only a portion of the cost and schedule information requested. Hot cell modification, process line fabrication, target fabrication facility modification, and general processing operational costs also are reflected in Section 5.22 of the EIS. Additional information on the estimated cost of the INEL alternative was obtained subsequent to the publication of the Draft EIS and was used in the preparation of the Final EIS; however, the amount of supporting material associated with these estimates was less detailed than that received from some of the other sites. Thus the Final EIS contains statements that indicate the margin of error for both the INEL and ORNL estimates are considered larger than those for LANL and SNL/NM.
- 11 The Department recognizes that "cradle-to-grave" waste management is a benefit of the INEL and LANL alternatives.
- 12 All alternatives considered have sufficient onsite spent nuclear fuel (SNF) storage capabilities to operate at 100% U.S. demand for at least 5 years.
- 13 Water use in the Albuquerque region is considered in this EIS. SNL/NM obtains its water from onsite wells at Kirtland Air Force Base (KAFB) and supplements it with water purchased from the Albuquerque municipal water system. The total water use from operation of the Annular Core Research Reactor at SNL/NM would increase from the current average of 5000 gal/day to 29,000 gal/day (Section 5.13), compared to total water use at SNL/NM of 1,000,000 gal/day (Section 4.1.13) or total water use in the Albuquerque region of 90,000,000 gal/day. This represents less than a 3% increase in water use at SNL/NM, or 0.03% increase in water use for the region, and would not be expected to substantially impact availability or quality of water in the aquifer.
- 14 Please see response to comment C056-1 above.

The Department recognizes that "cradle-to-grave" waste management is a benefit of the INEL and LANL alternatives and will consider this factor in making its decision on the proposed project.

**THERMO TECHNOLOGY
VENTURES INC.**

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February 9, 1996

Mr. Wade Carroll, NEPA Document Manager
Office of Isotope Production and Distribution, NE-70
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874

Attn: Medical Isotope Production Project EIS

Dear Mr. Carroll:

Please take this as our official response to the draft EIS.

As we discussed, Thermo Technology Ventures in conjunction with MIT and the DOE's Idaho National Engineering Laboratory, is working on a new and superior method of producing the valuable isotope ^{99m}Tc . The TTV team is creating a method based on developments at MIT using linear accelerator technology instead of nuclear reactors, as described in my August 7th letter to you; a copy is enclosed. This method is environmentally safe, requires no Government funding, and satisfies the US requirement in a timely way.

TTV's private enterprise approach is a non-nuclear reactor solution with the following benefits:

- **No Government funding is required** - Private enterprise with its own capital at risk
 - The Government can avoid spending \$45M for nuclear reactor facility modification and operating costs
- **Environmentally safe** - Accelerator technology that is kinder to the environment
 - No hazardous waste to dispose of
 - No bomb grade U235 is required
- **Assured source of supply** - Multiple accelerator production sites
 - No single point of failure that would jeopardize the supply base
 - Built-in redundancy with a network of multiple sites with overlapping coverage
- **Satisfies the entire US requirement** - Capable of producing all of the country's ^{99m}Tc
 - Potential of filling the need as quickly as Government subsidized ^{99m}Tc

We have made substantial progress toward our program over the past six months. Irradiations by MIT at both the NIST and RPI accelerators have confirmed production estimates and computer modeling. Technical feasibility is proven. Prototype designs are being demonstrated by the INEL that will offer enhancements to purification and separation systems that are currently available. In addition, our business analysis indicates this has excellent potential as a new

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A subsidiary of Thermo Electron Corporation

Richard F. Testa

Response to the Medical Isotope Production Project EIS

venture. As a result we are in the final stages of forming a joint venture between Thermo Electron and a major US radiopharmacy company to commercialize the MIT and INEL technology.

I would also like to add that, with the additional work done by MIT and the INEL, we are able to increase the throughput of these accelerators. This will enable us to satisfy the US demand with a total of 20 accelerator centers instead of the 40 that were originally projected. As a result, we can fill the US requirement in a much shorter time frame than originally planned. The first production center will open in the summer of 1997. After that, a number of accelerator sites will be installed and will be ready to supply the entire US demand as early as December 1999. That date is earlier than the expected decommissioning of the Canadian NRU facility, which currently provides the country with most of its Moly99. Also, we expect further increases in the efficiency of the accelerator production centers as MIT continues to develop clever target designs and the INEL enhances its purification and separation process. This will make it possible to satisfy the country's demand in an even quicker time period than currently estimated.

This project anticipates no Government funding. The Government could accelerate this schedule and ensure initial deployment of the accelerator centers in the US by providing incremental financing to this venture. That would enable the purchase and deployment of capital equipment in a shorter time period and cover markets that would be too aggressive for venture capital. If this were to happen, accelerator centers would be in place, producing Mo⁹⁹/Tc^{99m} in the same time frame as DOE's preferred option, the ACRR at Sandia.

Following are the major milestones that have been accomplished:

- Technical feasibility testing was conducted in July '95 and January '96
- These tests validated throughput calculations on accelerator sizing and target design. Additional testing using enriched target material is being scheduled.

Work is in progress to:

- Establish a joint venture which is expected to be consummated this spring
- Irradiate an enriched target and produce Tc^{99m} that is suitable for FDA submission by June 1996
- Acquire purification technology that will back up the work being performed by the INEL

To create the environment for private enterprise to satisfy our country's need for Tc^{99m}, the US Government should:

- Consider this approach superior to Sandia (or any other nuclear reactor alternative) and be prepared to halt the funding to Sandia as the TTV team completes its development program
- Identify and implement a strategy with the Canadian government that would phase out the Canadian government's subsidized Mo⁹⁹/Tc^{99m} as the TTV team phases in private enterprise Mo⁹⁹/Tc^{99m}

Page 2

Richard F. Testa

Response to the Medical Isotope Production Project EIS

I recommend that modifications be made to the draft EIS to include the TTV team's accelerator approach to producing $\text{Mo}^{99}/\text{Tc}^{99m}$ as follows:

Paragraph 3.2 No Action Alternative should include a subparagraph stating that TTV's accelerator production centers will be installed in the next three years and that these centers will have the capability of supplying the US requirement for $\text{Mo}^{99}/\text{Tc}^{99m}$.

Paragraph 3.3 Alternatives to Accomplish the Proposed Action should identify the TTV team as having the preferred approach. If the US Government needs earlier deployment of these accelerator production centers, it could consider funding the TTV team at a level that would accelerate implementation and enable earlier deployment.

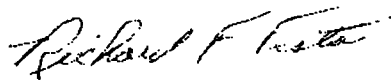
Paragraph 3.4 Alternatives Considered and Dismissed should delete all reference to TTV's program since it will be included in the paragraphs as stated above.

Supporting this private venture would obviate the need for the Government to spend taxpayers' hard-earned dollars on a solution that is less than optimum during this period of fiscal crisis. TTV's approach will supersede the DOE plan with an inherently better solution within the same time period. If the DOE proceeds with investing in nuclear reactor produced $\text{Mo}^{99}/\text{Tc}^{99m}$, it would represent a very serious threat to the formation of private capital to support this market. *This venture will not be capitalized if there is a cheap, government subsidized source of $\text{Mo}^{99}/\text{Tc}^{99m}$ in the marketplace.*

The TTV team's accelerator production method is ready for commercialization. It is environmentally safe, requires no government funding, satisfies all of the US requirement, and is more competitive than any of the alternatives listed in the draft EIS.

We would be happy to meet with you and your technical staff to brief you on our approach. Also, I look forward to working with you and your office to ensure that this accelerator approach is properly represented in the EIS.

Sincerely,



Richard F. Testa
Director, Venture Development

Enclosure: Summary - Accelerator production of $\text{Mo}^{99}/\text{Tc}^{99m}$
August 7, 1995 letter to Wade Carroll

Page 3

**THERMO TECHNOLOGY
VENTURES INC.**

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August 7, 1995

Mr. Wade Carroll, NEPA Document Manager
Office of Isotope Production and Distribution, NE-70
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874

Attn: Medical Isotope Production FIS

Dear Mr. Carroll:

It was nice talking with you this afternoon. As discussed, a member of Thermo Technology Ventures attended your meeting held in Idaho Falls on July 24 which sought environmental impact statements regarding the proposed isotope production project.

Thermo is in the process of evaluating an alternative production method for Tc99m, the daughter product of Molybdenum-99. Our approach is to use linear accelerators to directly produce Tc99m. This approach offers:

- A distributed production source, with no single point of failure as in reactor production
- No generation of radioactive waste
- High purity Tc99m with no possibility of hazardous contamination
- High activity Tc99m is produced
- Simplified handling and distribution since the linear reactors are close to the hospitals that use the product

We believe that this approach offers reduced costs and greater flexibility to address the national need for Tc99m.

The proposed production of Mo99 in the Sandia ACR reactor or at other federal sites will severely impact our private production plans and the ability to raise venture capital for this venture. Our project is depending upon the government providing private enterprise with its traditional incentives to enter into production of Tc99m. Also, our project will provide the American people with the right amount of surety that there will be an uninterrupted supply of this needed isotope at reasonable prices.

The suggestion that was made at the public scoping meeting of having DOE provide funding to assist the private sector would be helpful in developing this technology. I would like to work a phased program with the DOE to determine what funding is available for these efforts in order to encourage the private sector to develop the required infrastructure to produce Tc99m.

I look forward to working with you. Please put me on the distribution list for follow-up and related efforts regarding Tc99m.

Sincerely,



Richard F. Testa
Director, Venture Development

A subsidiary of Thermo Electron Corporation

SUMMARY INFORMATION

Accelerator Production of Mo⁹⁹/Tc^{99m}

A safe and economical way to produce a medical isotope that is critical in over 10 million procedures per year in the United States and whose current supply is in jeopardy:

Thermo Technology Ventures, Inc., in conjunction with the Massachusetts Institute of Technology and DOE's Idaho National Engineering Laboratory/Lockheed Martin Idaho Technologies is developing an alternative production method for technetium 99m (Tc^{99m}), the daughter product of molybdenum 99 (Mo⁹⁹).

- MIT's department of nuclear engineering created a novel and proprietary invention that makes linear accelerator based production of Tc^{99m} technically feasible
- Lockheed Martin Idaho Technologies is developing a process to refine the accelerator produced Tc^{99m} and prepare it for delivery to hospitals and radiopharmacies
- Thermo Technology Ventures is forming a joint venture to commercialize this technology

The production of medical isotopes is a growing market with a very fragile supply base:

Medical isotopes are used for diagnostic and therapeutic purposes and are supplied primarily through nuclear reactors. Technetium 99m (Tc^{99m}), the most important and fastest growing medical isotope, is currently produced in nuclear reactors by irradiating enriched Uranium 235 to form the fission product isotope Mo⁹⁹. This isotope, with a half-life of 66 hours, decays to Tc^{99m}, which has a half-life of 6 hours and is used in over 90% of the nuclear diagnostic imaging scans. In the United States, there are ten million radiopharmaceutical diagnostic imaging scans per year that use Tc^{99m}, half of the world-wide usage.

The nuclear reactor based production and distribution channel is long, cumbersome, hazardous, expensive, and subject to disruption. Currently, the entire US supply of Tc^{99m} is produced by one reactor, the aging, 38 year old, heavily subsidized Canadian NRU reactor at Chalk River, near Kanata. The Canadian government would like to close this reactor. It is currently under litigation from Nordion, a Canadian based company that distributes Mo⁹⁹ in North America, to enforce a 23 year supply contract that will expire in 2011. Nordion is owned by MDS Health Group, a Toronto based company established in 1969 and now the largest health and life sciences company in Canada. The Canadian nuclear reactor is expected to be closed by the year 2000. The Canadian government is considering investing in two smaller reactors solely for the production of Mo⁹⁹/Tc^{99m}.

Nordion receives the Mo⁹⁹ from this Canadian reactor. They purify the isotope and package it for shipment. Nordion then distributes the isotope to its US customers: DuPont Merck, Amersham, and Mallinckrodt. These customers package the Mo⁹⁹ in Tc^{99m} generators and distribute these generators directly to hospitals and radiopharmaceutical companies. Hospital pharmacy staff and radiopharmaceutical companies extract the Tc^{99m} from the generator and

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Thermo Technology Ventures, Inc.

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package the isotope per prescribed unit dose to be used directly by the physicians. Since the half-life of Tc99m is very short, it's imperative that the source be close to the hospitals, making distribution key to fulfilling customer requirements. The half-life of Mo99 is 66 hours. Therefore, generators are in constant movement from multiple sites back and forth to the reactor.

Linear accelerator produced Tc99m greatly simplifies the now awkward, expensive, and hazardous production and distribution system.

Accelerator produced Tc99m will bring the manufacture of the isotopes closer to the hospital sites and provide customers with a viable, long term, redundant, and local source of supply and is competitive with current world pricing.

This new accelerator concept is quickly moving from the conceptual design and feasibility stage to development. Tests have already been conducted proving the feasibility of production and patents have been applied for. Thermo Technology Ventures' business plan calls for development to be complete and FDA approval obtained by December 1996, with regional production centers to begin operation in 1997. About five years will be required for complete implementation to supply the entire U.S. demand by regional production centers, with the interim balance to be supplied by reactor produced Mo⁹⁹.

Forty accelerator centers will supply 100 percent of the United States demand for Tc^{99m}. These accelerator centers would be located at or near medical facilities which would greatly simplify handling and transportation of the Tc^{99m}.

TTV is discussing this concept with selected medical isotope suppliers to establish a joint venture to manufacture and distribute the Tc99m. TTV has also provided the DOE Isotope Production and Distribution's Environmental Impact Study with information regarding this accelerator produced Tc99m so they can include this source of production in their planning documents and investment considerations for the Sandia reactor.

No Government subsidy is required:

This industry initiative represents a viable commercial alternative to government subsidized nuclear reactor based production. As private enterprise makes the accelerator based Tc^{99m} product available, reactor based Mo⁹⁹/Tc^{99m} will be phased out ensuring an uninterrupted supply of Tc^{99m} for the US population. This network of accelerator centers will provide an economical, highly reliable, and indigenous supply of Tc^{99m} that will be commercially available, replacing reactor produced Mo⁹⁹/Tc^{99m} and other medical isotopes.

Multiple benefits of accelerator produced Tc99m:

This new accelerator concept offers many improvements over the current Mo⁹⁹/Tc^{99m} nuclear reactor based production method which has been used exclusively over the past 30 years. These improvements are:

- No single point of failure
Over 40 distributed production sources, networked together will be able to produce the total US requirement of Tc99m

October 26, 1993

Thermo Technology Ventures, Inc.

- No generation of radioactive or hazardous waste
Current reactor based production produces fission products which must be disposed of and is currently not considered in the pricing of the Tc99m
- No use of enriched uranium 235
Weapons grade uranium 235 is used in the current process of producing Mo99, providing for an increased national security risk and increased costs of handling, protecting, and accounting for this material. The enriched U235 is currently not recycled and is stored as waste with tight security required to divert possible diversion to weapons production.
- High purity Tc^{99m} with no possibility of hazardous contamination
The reaction within the accelerator beam produces very low impurity levels, with no possibility of carryover of hazardous fission products into the Tc99m as in reactor fission produced material.
- High specific activity Tc^{99m} is produced
Each accelerator produces high specific activity Tc99m, comparable to the current product.
- High productivity
Each accelerator produces enough Tc99m to supply 1,000 unit doses a day for distribution to local hospitals and radiopharmacies.
- Simplified handling and distribution
No clumsy generators are required to transport the isotope. Tc99m will be packaged at the manufacturing site and delivered directly to the hospitals. The extra work required to purify the reactor produced Mo99, shipping it to generator manufacturers, who in-turn, repackage for shipment to hospitals and radiopharmacies who have to extract Tc99m from the generators and finally repackage it for unit dose requirements is all eliminated. This new procedure saves time, is responsive to customer demand, and has improved safety with less hazardous waste and reduced worker radiation dose.

Note: Thermo Technology Ventures, Inc., headquartered in Idaho Falls, Idaho, was formed to commercialize technology within the INEL. TTV is a wholly owned subsidiary of Thermo Electron Corporation, a \$2 billion corporation located in Waltham, Mass.

Lockheed Martin Idaho Technologies, headquartered in Idaho Falls, Idaho, was formed to maintain and operate the INEL. LMIT is a department of Lockheed Martin Corporation, located in Maryland and the largest government contractor.

Accelerators provide a means of accelerating charged particles such as electrons, protons or deuterons to high energies. In a linear accelerator, commonly known as a LINAC, a beam of electrons is injected into an accelerating tube and accelerated to high energy. Accelerating sections are connected to a high frequency alternating voltage from a high powered oscillator. Electron accelerators produce high energy photons by impact of the accelerated electron on a tungsten target.

October 26, 1995

Thermo Technology Ventures, Inc.

Responses to Comment Letter C057

- 1 The Thermo Technology Ventures (TTV) concept, including the benefits of a non-reactor production facility, is discussed in Section 3.4.3.3 of the EIS.
- 2 If funding is to be provided to investigate a new concept, Federal procurement regulations require that the Department issue Request for Proposals or that the company investigating the new concept send an unsolicited proposal to the Department. In December 1995, the Department published a Notice for Expression of Interest in the *Federal Register* to determine if there is interest among private sector companies in privatizing various DOE isotope production operations. If the Department proceeds with the action proposed in this EIS and if the response to the Notice for Expression of Interest indicates that there is significant interest in privatizing some isotope production operations or there are potentially viable alternative concepts to produce isotopes (such as Mo-99), the Department would issue a Request for Proposals.

Thermo Technology Ventures (TTV) contacted the Department in October 1995 to inquire about how to submit a proposal for Federal funding for their concept, and the Department responded in October with the requested information. To date, no request for funding has been received from TTV.

- 3 As stated in the EIS, if the Department decides to pursue this project, it would phase out production of Mo-99 as private sources begin reliably producing Mo-99. If TTV begins reliably producing Mo-99 in sufficient quantities to satisfy 100% of U.S. demand before the Department's production facility comes on line, then the Department would halt the project.
- 4 A private company in Canada, Nordion International, is currently supplying Mo-99 to the U.S. Nordion contracts with the Canadian government for irradiation services in the National Research Universal (NRU) reactor to produce its Mo-99. Nordion has informed the Department and the medical community that it intends to build two new reactors using private funds to replace the NRU, which is scheduled to shut down in 2000.
- 5 Section 3.2 on the no action alternative addresses the impacts of not proceeding with the proposed action given the current environment. It does not address future possible or probable events. Section 3.2.2 has been modified to reflect recent progress by TTV in the development of its accelerator concept.
- 6 As stated in the comment letter, the earliest that the TTV concept could be supplying the entire U.S. demand for Mo-99 is December 1999. While the Department would welcome the production of 100% of the U.S. demand by TTV or any other private company, this concept cannot meet the purpose of and need for the proposed action for the reasons discussed in Section 3.4.3.3 and, therefore, must remain in the category of Alternatives Considered but Dismissed with respect to this proposed action.
- 7 As discussed in Section 3.4, the new technologies that are being investigated do not appear to hold the potential to produce 100% of the U.S. supply of Mo-99 in the near term (within 1 to 3 years). Therefore, these options are not considered in detail in the EIS. However, the Department will continue to monitor the progress of these new technologies and would stand prepared to phase out its production if these new technologies begin reliably producing Mo-99.

As stated in the EIS, the Department intends to operate only as a backup to the existing Canadian supplier. The Department will only produce and sell Mo-99 in sufficient quantities to maintain the capability of the facilities and staff to produce 100% of the U.S. demand for Mo-99 in case of a supply shortage. The Mo-99 would be sold at the prevailing world market rates therefore, the Department does not believe that its proposed project would represent a cheap, subsidized source of Mo-99 in the marketplace.

IDAHO BRAIN TUMOR CENTER

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February 8, 1996

The Honorable Hazel O'Leary
Secretary of Energy
Department of Energy
1000 Independence Ave, S.W.
Washington DC, 20585

Dear Secretary O'Leary,

1 | The Idaho Brain Tumor Center (IBTC) strongly supports the selection of the Power Burst Facility (PBF) in Idaho as the Department of Energy's (DOE's) primary choice for the production of Molybdenum 99 for the following reasons:

The mission of the Idaho National Engineering Laboratory (INEL) includes medical uses for nuclear technology. The two New Mexico labs under consideration, Sandia and Los Alamos, are defense mission labs. We urge DOE to support the current lab-assigned mission of PBF at INEL and support medical technology at INEL.

2 | INEL currently has 20 years of experience in producing Cobalt 60 and other medical isotopes for the medical community. This experience is not present at Los Alamos and Sandia. DOE should capitalize on the experience of INEL in making it's decision to choose PBF as the primary site for Mo 99 production.

3 | DOE has prioritized bringing Mo 99 into the realm of the private sector for production of medical isotopes. The PBF at INEL is best set up to make this happen the soonest because of DOE's lease with the Idaho Brain Tumor Center. Privatization is well under way through this arrangement.

4 | The Annular Core Research Reactor (ACRR) at Sandia is a Department of Defense Reactor Facility which disqualifies it for commercialization. This restriction severely limits the reliability of ACRR as either a primary or secondary Mo 99 back up. In the event that there is a DOD use for the ACRR, the defense priority would be superior to the medical isotope priority and millions of patients would suffer. The medical community in this country will seriously and vocally question that type of decision making.

5 | INEL's PBF reactor currently has a commercial lease and a plan to treat cancer patients using BNCT. The Mo 99 mission is compatible with the BNCT mission. The selection of PBF at INEL enhances both missions and this best supports INEL's overall mission of medical use for nuclear technology.

IDAHO BRAIN TUMOR CENTER

6 It would be erroneous for DOE to make it's decision based upon suggestions that Sandia can be in medical isotope production in 22 months versus 28 months for PBF. The current Environmental Impact Statement (EIS), (page iv) indicates by DOE's own admission that the Canadian source is not seriously questioned for at least three to four years. Therefore the goal of having earliest production of small amounts (10%) of Mo 99 should not drive the selection of Sandia simply because Sandia has a 6 month earlier window.

7 There is ample evidence to suggest to DOE that National Policy interests compel DOE to seriously look at a 100% or more production of USA needs for Mo 99. A loss of the current foreign supply is likely to be a complete loss and a back up of 10-30% would not sustain minimum US needs for any prolonged period of time (EIS pp v). There are, in many quarters, discussions regarding claims that DOE's arbitrary decision made in conjunction with foreign based isotope producers and distributors, to limit U.S. Mo 99 production to between 10% and 30% of domestic use, circumvents important national policy. This decision rightfully belongs at the President's cabinet level and/or the Congress of the United States. Dependency on foreign sources threatens supply in time of national emergency, drives up prices for hospitals, doctors and patients, and runs counter to administration goals of providing increased access to medical care for all Americans.

8 There are five hot-cell facilities at the INEL site. Only one, the TAN hot-cell facility was considered by DOE. Four other facilities are actually better alternatives than TAN. Some of these hot-cell facilities would require no shipping of radioactive material and radioactive waste on public highways and across state lines. The choice of New Mexico would require shipment of radioactive material and radioactive waste on public highways and has received strong negative environmental impact comments from residents of New Mexico.

9 The INEL hot-cells are clearly superior to any of the preferred choices offered at the other sites. Especially if INEL uses one of the two Chem Plant's modern and available units.

There is overwhelmingly positive public support in Idaho for the Moly 99 mission. Not a single negative oral statement was made in either of the two, very well attended Idaho public hearings. People in Idaho want Mo 99 production in Idaho. They want a medical mission to succeed for the nuclear industry.

IDAHO BRAIN TUMOR CENTER

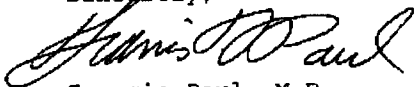
10 The analysis of the PBF option in the EIS indicates considerably more reactor modification work and cost than are necessary. INEL employees stated that some of their cost estimates were doubled by the EIS authors in their EIS report. The public hearing in Idaho revealed that already existing cost estimates for the PBF option were much more detailed and actually cost considerably less than those submitted in the EIS. When employees of INEL testified that their cost sheets were disregarded and some of their cost numbers were doubled, DOE representatives replied that DOE thought some of the cost "looked too low" so they arbitrarily raised them.

11 DOE's selection of Sandia would require design and manufacture of new fuel and also requires initial use of highly enriched Uranium which increases security risk and waste. PBF uses low, enriched fuel and is the superior alternative to Sandia in this regard.

12 PBF has a clear advantage over ACRR at Sandia because of the availability of existing fuel and the ability to operate PBF on a reduced power design for PBF. ACRR would require new fuel and would require doubling of design power making PBF a clear choice.

13 The cost for PBF to produce 100% of domestic need is lower for both start up and operation than the preferred option at Sandia as indicated in the EIS, even though cost savings (items 11 and 15) were not considered. Over 25 years, this represents savings in excess of a hundred million dollars.

Sincerely,



Francis Paul, M.D.

CC: Assistant Secretary Terry Lash DOE, Wade Carroll DOE, Senator Larry Craig, Senator Dirk Kempthorne, Congressmen Mike Crapo, Congressmen Helen Chenoweth, Governor Philip Batt, Western Partners

Responses to Comment Letter C058

- 1 Comment noted.
- 2 As presented in Table 3-2, LANL and ORNL also have significant experience in the production and distribution of isotopes.
- 3 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE. The Department is aware of this potential for the INEL alternative. Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.
- 4 The Annular Core Research Reactor (ACRR) is an Office of Defense Programs facility within DOE, not a Department of Defense facility. It is possible that the ACRR, the preferred reactor for the proposed project, could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration and does not diminish its potential for privatization.
- 5 The IBTC has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 6 The entire U.S. supply of Mo-99 is produced in a single reactor in Canada. If this supply were to become unavailable, the U.S. would face a Mo-99 shortage. The preferred alternative could produce a small amount of Mo-99 six months after the Record of Decision. The ability to produce a fraction of the U.S. demand in a short period of time is important because, if a Mo-99 shortage were to occur in the near future, the Department would be able to supply at least part of the U.S. needs.
- 7 All of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99. If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The goal of the proposed project is to ensure that a reliable supply of Mo-99 is available to the U.S. medical community; thus, 100% of the U.S. demand would be produced only during times when the Canadian supply was unavailable. The goal of producing 10%-30% of the U.S. demand on a continuing basis is to allow the U.S. facilities to respond quickly to the need to supply 100% of the demand when necessary.

The Department's decision on the proposed project will be documented in a Record of Decision that will be signed by the Secretary of Energy or the Director of the Office of Nuclear Energy, Science and Technology.
- 8 The options considered were to use the Test Area North (TAN) Annex hot cell facility or to build new facilities adjacent to the Power Burst Facility (PBF). The new cells would cost approximately \$4,500,000 to

\$5,000,000, which would significantly increase the cost of the INEL PBF option. Of the five existing hot cells the commentor cites, two (the Hot Fuel Examination Facility and the Fuel Conditioning Facility) are currently in use and are not available for Mo-99 production. A third, the Test Reactor Area Hot Cell, is not adequate for Mo-99 production. Of the two remaining hot cells, the TAN Annex was chosen over the Idaho Chemical Processing Plant (ICPP) hot cells because the modifications costs would be similar and because using the TAN Annex provides a bounding environmental analysis in the EIS. This would not preclude use of the ICPP hot cells for Mo-99 production.

- 9 As described in the EIS, some transportation of Mo-99 and small quantities of low-level waste would be required at any of the alternatives considered. For some of the alternatives, this transportation would take place almost exclusively onsite, while others would require use of public roads. The ORNL alternative and the preferred alternative at SNL/NM both would require periodic shipments of low-level waste out of state to the Nevada Test Site.
- 10 The modifications required for full production are described in Section 3.3.4.9. The cost estimates used in the analysis in Section 5.22, as well as the basis for these estimates, were discussed with cognizant INEL personnel.
- 11 The PBF is the only option currently using low enriched uranium fuel. All the other options evaluated in detail have designs for converting to low enriched uranium. The objective is to not build any more highly enriched uranium fuel bundles for any of the other options, but to use the fuel already on hand until the supply is exhausted or, in the case of ACRR, until the burnup limit is reached (see Section 3.3.1.9). Two or three transition cores of both low enriched uranium and highly enriched uranium would be used during the conversion to all low enriched uranium fuel for these options. This is a long-term safeguards advantage, in that it depletes and irradiates the weapons grade material on hand.

It is not true that use of low enriched uranium fuel minimizes waste. More spent fuel bundles are generated per reactor full power year with the use of low enriched uranium bundles.

- 12 The amount of PBF fuel is limited. With all available fuel on hand, the PBF can run for only 1000,000 - 150,000 MW hours. At a power of 10 MW, the fuel will last approximately 625 days. The PBF fuel is one-of-a-kind and will be quite expensive to replace. It requires a special manufacturing run on a one-of-a-kind design at a fuel manufacturing facility. Conversely, the TRIGA type fuel that would be used to replace the existing fuel in ACRR is very common and is relatively inexpensive to produce. The new ACRR fuel would be phased in as the burnup limit on the existing fuel is reached (see Section 3.3.1.9).

Regarding the increased power requirements at the ACRR, the SNL/NM alternative includes the design, equipment modifications, and licensing efforts required for the power upgrade. The design calculations and safety basis upgrade to address the power increases have been completed. These efforts and the hardware required for the modification are included in the cost estimates in Section 5.22.

- 13 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

ON THE
U.S. DEPARTMENT OF ENERGY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE
MEDICAL ISOTOPES PRODUCTION PROJECT

PLEASE PRINT CLEARLY

NAME: PRISCILLA TRACY
STREET ADDRESS: 3708 CHERAZ NE
CITY: ALBUQUERQUE STATE: NM ZIP CODE: 87111
TELEPHONE: (505) 275-6145

1 | Your comment form is not designed to contain many comments—there is barely room to write "Molybdenum-99 and Related Isotopes" on it. Also there is no address on the form, no point of contact, no phone number. The form sends a message.

2 | What is all this about? Canada is doing fine producing and transporting this nuclear medicine—we should not interfere with their industry. There is no need to spend tax dollars to create a company to give away to some business. The city of Albuquerque has much to lose and nothing to gain by locating a facility like you propose here. See references below:

Reference page 5.1, fourth paragraph of your Draft EIS:
"The effect on economic climate and community resources would also be minimal because of the relatively small number of workers that would be employed in the isotope production project."

Reference page 5.2, fourth paragraph:
"Because the DOE intends to produce Mo-99 even when the Canadian source is supplying MO-99, periods may occur when the DOE is unable to sell the MO-99 that it produces. In this case, the unsold Mo-99 would have to be disposed of as low-level radioactive waste. The disposal of unsold Mo-99, with the other low-level radioactive waste generated during production, is bounded by the analyses in this EIS".

3 | The quality and quantity of Albuquerque water is deteriorating. A migrating plume of Trichloroethene (TCE) contamination is already in the aquifer. In addition to contamination, we are also a desert city very short of water. See attached newspaper article—the city will soon begin to sink as the level of the water in the aquifer goes down. As the city sinks, the ground and the structures built on it will crack. Pumping too much water will have a significant environmental impact on this city. Your own phrase "Irreversible and Irrecoverable Commitment of Resources" says it all—"when a resource is irretrievably lost and cannot be replenished." That's what will happen to our water. This is not a good place to locate a water-thirsty industry. DOE wants to use 11,000,000 additional gallons a year for this project in addition to the 1,002,500 gallons already used (page 4.9 EIS & hearing discussions).

4 | Whatever happens to Kirtland Air Force Base, happens to the city of Albuquerque. The base and the city actually touch. Many people work on the base besides just DOE employees; some people actually live on the base. This is a big population center. The risks are too great to locate a nuclear facility, store nuclear waste, transport nuclear products and waste.

DOE does not look critically at its own proposals and actions. The Agency is looking at what it wants to do through rose-colored glasses when it ought to remember what happened at Rocky Flats.

The sales pitch for these medical isotopes is that they are important to the world. So is water. If you want to make something wonderful for the world, make water.

Priscilla Tracy *Priscilla Tracy Feb 8, 96*
3708 Cheraz NE
Albuquerque, NM 87111 Phone: (505) 275-6145

1 atch- newspaper article

NOTE ORIGINAL CONFIRMS FAX OF 9Feb 96- REPORT OF TRACY MISSION ATTACHED

Heavy water use may sink the city - literally

By Lawrence Spohn
CAPULI REPORTER

Some sections of Albuquerque could begin sinking if the city's thirst for under-
ground water isn't quenched soon, a new
study says.

Continued heavy water pumping could
produce "surface land subsidence"
throughout the city, according to the study
by William Haneberg of the New Mexi-

co Bureau of Mines and Mineral Re-
sources in Albuquerque.

Haneberg warned today that this could
have enormous economic consequences,
such as fractured underground utility lines,
sinking buildings and streets, and tilting
canals and sewers.

It's a problem significant in mining
communities, notably those built atop coal
mines in the East and Midwest where

networks of tunnels collapse over time.
This undermines the land surface and
causes structures above to sink.

In mining communities, mine houses
or other buildings directly above a mine
tunnel may sink several inches or even
feet.

But in Albuquerque, major portions of
the city sit on top of the aquifer and could
experience "widespread land subsidence

if heavy groundwater pumping contin-
ues," Haneberg cautioned.

Haneberg's study is in the current is-
sue of the scientific journal "New Mexi-
co Geology."

Removing large volumes of water from
the vast underground reservoir reduces the
"buoyant support for the sand and gravel
grains that support the aquifer," he

Please see WATER/A8

C7 Crossword/games.....C8 Insights.....C1 Movies.....D2 Sports.....B1 Wild Life.....D1
C14 Deal Bark.....B7 Local/State.....A3 History/World.....A4 TV.....C6 Weather.....B6

WATER from A1

explained.

As water is removed, "the aquifer is
compacted under its own weight" and
the stress of the land above it, he said.

He estimates that the aquifer be-
neath the city could "be compacted by
as much as 10 feet for every 100 feet
that the water level falls."

However, subsidence would be
closer to 1 or 2 feet, he predicted.

Hydrologists already figure the wa-
ter level has dropped beneath Albu-
querque by about 160 feet.

For now, the single number for na-
tional consequences appears to be
about double that. If water levels dip
to about 330 feet below initial eleva-
tions, sinking will begin to occur,
Haneberg predicts.

However, water levels dipping to as
little as 200 feet or as much as 400 feet
could trigger subsidence.

"In Albuquerque, we are fortunate
because we can anticipate the poten-
tial for land subsidence, look at the
damage it has caused in other places
and have enough time to make deci-
sions before subsidence becomes an
issue," he said.

For those who think the threat,
Haneberg cited "major economic
problems in and around cities such as
Phoenix, Tucson, Houston and Las
Vegas, as well as Denver."

"Heavy groundwater pumping
south of Denver is responsible for
land subsidence and the occurrence of
large cracks, in some cases several

hundred yards long, in the ground," he
explained.

The study was the result of a coop-
erative research agreement between
the state Bureau and the city of Albu-
querque. Collaborators included hy-
drogeological geologists with the U.S.
Geological Survey.

Another study reported in the jour-
nal concludes that restoring the
aquifer might be feasible.

Surface water injection of treated Al-
buquerque sewer effluent, as well as
Rio Grande surface waters "will prob-
ably be successful," concludes bureau
geologist T.M. Whitworth.

Fax Cover Sheet

Date: Feb 9, 96
 MR. WOOD CARROLL, MIPP
 To: EIS DOCUMENT MANAGER
 PRISCILLA TRACY
 3700 CHENOWETH AVE NW
 From: ALBUQUERQUE, NM 87111
 Fax Number: (505) 903-5134
 VOICE - (505) 903-7131
 Contact Number:
 Message: SUBJECT: COMMENTS ON MEDICAL ISOTOPES
PRODUCTION PROJECT: MOLYBDENUM-99 AND RELATED MEDICAL
ISOTOPES. DRAFT ENVIRONMENTAL IMPACT STATEMENT.
COMMENTS MUST BE POST-MARKED TODAY. I AM ALSO
RAYING TO ENSURE TIMELY RECEIPT. FOLLOWING
ARE COMMENTS AND A NEWSPAPER ARTICLE'S REFERENCE

Total number of pages including this cover sheet: 3

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 MB : SEND TO MAILBOX 1G : POLLING A REMOTE NP : NEXT-POLLING RM : RECEIVE TO MEMORY

Responses to Comment Letter C059

- 1 For the convenience of the public, the Department provided a form for individuals who wished to submit comments while attending the public hearings. Because the form was intended to be turned in at the hearings, mailing information was not provided on it. Individuals who wished to submit comments by mail had access to the Department's project address through other materials distributed at the hearings, including the Draft EIS and an informational brochure. Additionally, the mailing address was printed in all public notices.

With regard to the amount of writing space on the form, it should be noted that the Department placed no limitation on the number of forms that could be used for any comment. Individuals had the option of continuing comments on multiple forms or other sheets of paper.

- 2 If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The goal of the proposed project is to ensure that a reliable supply of Mo-99 is available to the U.S. medical community, not to produce Mo-99 for export and to compete in the worldwide market for Mo-99.

The Department would prefer that the private sector assume responsibility for ensuring that a reliable supply of Mo-99 is available to the U.S. medical community; however, private industry has thus far been unwilling to do so. Therefore, DOE has proposed to conduct the Medical Isotopes Production Project. If private industry is able to ensure a reliable supply of Mo-99 on its own, the Department could phase out its production activities.

If DOE decides to pursue this project, private industry may wish to privatize some or all of the production activities. If a private company makes such a proposal, the Department will thoroughly evaluate the costs and benefits of such a proposal, including the effect privatization would have on other isotope production ventures.

- 3 The impact of EIS proposed actions on water use in the Albuquerque region is considered in this document. SNL/NM obtains its water from onsite wells at Kirtland Air Force Base (KAFB) and supplements it with water purchased from the Albuquerque municipal water system. The total water use from operation of the Annular Core Research Reactor at SNL/NM would increase from the current average of 5000 gal/day to 29,000 gal/day (Section 5.13), compared with total water use at SNL/NM of 1,000,000 gal/day (Section 4.1.13) or total water use in the Albuquerque region of 90,000,000 gal/day. This represents less than a 3% increase in water use at SNL/NM, or 0.03% increase in water use for the region, and would not be expected to substantially impact local geology or availability and quality of water in the aquifer.
- 4 The concerns expressed in the comment regarding risks associated with medical isotope production are noted; however, the risks associated with any alternative considered in the EIS are low. The risks as well as the benefits to the public associated with producing and transporting medical isotopes will be taken into account by DOE in its final decision on whether to implement the project, and at which site, if any, it should be located.



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 5, 1996

Mr. Wade Carroll, EIS Project Manager
Medical Isotopes Production Project (NE-70)
U. S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874-1290

Dear Mr. Carroll:

I am responding to the letter dated December 13, 1995, from Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Assistance to Mr. Robert Bernero, requesting comments on the Department of Energy's document, "Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes, Draft Environmental Impact Statement".

1

2

In a cursory staff review of the document, we are in agreement with the overall conclusions of the report and in the necessity for a domestic supply of molybdenum-99 (Mo-99). One issue identified by my staff is in the evaluation of the environmental consequences of the transportation of the Mo-99, to the radiopharmaceutical companies for processing. Consideration of the existing and comparable shipments from Canada to these same companies may result in a finding of no increase in risk\impact over that of current transportation practices.

Thank you for the opportunity to review this document.

Sincerely,

A handwritten signature in cursive script, reading "Donald A. Cool", is positioned above the typed name.

Donald A. Cool, Director
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Responses to Comment Letter C060

- 1 Comment noted

- 2 If the Department decides to ship Mo-99 to Nordion for final product testing and distribution, then the transportation impacts of shipments from the DOE facility, as discussed in Section 5.11, would essentially be additive to the impacts of Nordion's current transportation activities. If the Department decides to ship Mo-99 directly to the radiopharmaceutical companies, then the transportation impacts of DOE shipments would essentially supplant the impacts of part or all of Nordion's transportation activities.

GLEN DARNELL
318 Bainbridge Drive
Tetonia, Idaho 83452

February 8, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874

Dear Mr. Carroll:

I would like to make my input on the draft environmental impact statement for the MIPP-EIS.

1 | It should be a MUST that the Molly-99 production facility be capable of sustained production of at least 100% of America's medical needs. To do less when the capability exists would be a waste of taxpayer funding.

2 | The current "preferred alternative" is the Annular Core Research Reactor (ACRR) at Sandia National Laboratory in New Mexico. As I understand it, the ACRR would require extensive modification to produce even 75% of America's Molly-99 needs. I assume that the modification would require additional EIS development, related documentation, etc. (A costly effort.)

3 | The Power Burst Facility (PBF) at the Idaho National Engineering Laboratory can produce approximately 150% of America's needs for Molly-99 without modification. Since this is to be a commercial venture, it is logical to provide profit incentive to potential investors by offering the capability to meet not only America's needs, but Canada's as well. Especially when the PBF is less expensive than the ACRR at the outset.

4 | If logic transcends politics, the PBF will prevail, especially when the Boron Neutron Capture Therapy capability is added to the commercialization equation. In tern, America's (and the world's) medical proficiency will be enhanced while the taxpayer is rewarded.

Sincerely,


Glen Darnell

Responses to Comment Letter C061

- 1 All of the reasonable alternatives would (after necessary modifications) have the capability to produce at least 100% of the U.S. demand for Mo-99.
- 2 The modifications required to produce 100% of the U.S. demand for Mo-99 using the Annular Core Research Reactor (ACRR) are detailed in Section 3.3.1.9 of the EIS.
- 3 As discussed in Section 3.3.4.9, several modifications to the Power Burst Facility (PBF) would be required. Besides modifying the central cavity, which is a significant modification, the reactor control system would need to be modified for a continued steady state, non-pulse mode. The transient rods would need to be removed and fixtures for target irradiation placed in the vacant locations. Cooling flow to the central cavity would need to be appropriately established, along with the normal core cooling flow in lieu of the contained loop that currently exists. Flow balance valves for the central irradiation cavity would have to be designed and installed to assure that appropriate target cooling flow is established without flow-induced vibration of the targets occurring. The core would need to be redesigned to supply a hardened spectrum of neutrons to the central irradiation cavity. Concentration of the power to the core center would be needed to establish the appropriate flux levels without needing to operate the reactor above 10 MW to make the facility competitive regarding fuel utilization.

The intent of the proposed project is to act as a backup to the existing Canadian supplier of Mo-99 in case that source of supply becomes unavailable. The Department is not proposing to compete in the worldwide market for Mo-99.

- 4 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

FAX

U.S. Citizen
1405 Glennbrier
Idaho Falls, ID 83401
H: (208) 523-9219

Date 02/06/96

Number of pages including cover sheet _____

To:

Wade Carroll, MIPP-EIS
Document Manager

Phone 301-903-7731Fax Phone 301-903-5434

CC: _____

From:

Bentley J. HarwoodUS CitizenMS Nuclear EngineeringPhone 208-523-9219

Fax Phone _____

REMARKS:

☐ Urgent ☐ For your review ☐ Reply ASAP ☒ Please comment

I would appreciate a written response to the following comments. Please call me prior to faxing so that I may activate my fax machine.

1 5.15.4.2 The first paragraph states that the Omega West Reactor is similar to the Power Burst Facility. Although this may be true, later in the same paragraph, the EIS states that "In all cases, the design basis accident described in the Omega West Reactor SAR bounded the consequences, and thus qualitative description from the Omega West Reactor SAR were used in developing..." The problem that needs to be corrected is the fact that fuel elements in these two cores are totally different. Omega is aluminum alloy while the Power Burst is stainless steel oxide. Core melting temperatures are likewise vastly different. This then leads me to believe that source terms from these scenarios should be completely different. The melting of aluminum takes place over a small temperature range while stainless steel oxide does not. Further, other components of either reactor would likely melt and shutdown at different points prior to any type of release.

The Power Burst Facility used to perform experiments on utility fuels up to and including their destruction while retaining the Power Burst Facility reactor core integrity. It, in my opinion, is extremely unlikely that a fuel melt would occur under any conditions at the PBF. A more probable scenario is likely to be more along the lines of the Sandia aircraft crash or natural phenomena resulting in fuel cladding breach but certainly not fuel melting.

This scenario needs to be re-evaluated to at least recognize the above described differences.

2 5.15.4.2 Table 5-41 lists a dose to a public access location 1000 m to the South. This road or whatever this is does not exist. The closest public access is the highway to the South much further than 1000m. There is no turnoff, parking, or road where this calculation indicates people will be. From USGS maps, the approximate distance from the PBF to Highway 20 is just short of 4 miles. All access to the PBF is controlled (the public cannot routinely enter the area) and Highway 20 can be closed very quickly in an emergency. Note that Highway 20 actually crosses the Southern boundary of the INEL site. That is, the INEL site boundary is around 7.7 mi. from the PBF. The distance used for this calculation is in error as well as the source term.

The other tables in section 5.15.4 also have the same problems just described. These calculations must be corrected before this EIS is issued as final.

3 4.1.2.3 This section states that the shortest distance between the Albuquerque city limits and the reactor area is 2 km (1.2 mi.). Why do the consequence calculations in section 5.7.1 use 5.4 km (3.4 mi.)? I believe the MEI is a person that lives at the closest boundary. Justification is required to make this argument stick.

- 4 4.4.7.2 The first paragraph discusses INEL operations related to sources of radioactive emissions. The Navy training reactors referred to have been shut down and no longer have emissions. Spent nuclear fuel testing is no longer conducted. Nuclear fuel stabilization consists of repackaging and results in nearly unmeasurable releases. This paragraph should be corrected to reflect current operations.
- 5 4.4.7.2 The third paragraph discusses the emission of noble gases and various other products. Where are these coming from? Most facilities that would produce these products have not been operational for many years. The largest error in this paragraph is the discussion of Krypton-85 releases due to fuel reprocessing at the ICPP. This operation has not run since before 1991. The reference used here is incorrect. The EIS must reflect current conditions. Lastly, only one reactor remains operational. The statement that refers to "reactor operations release ..." should be corrected to indicate that it is not many reactors, but only one.
- 6 4.4.8.1 The statement that PBF is 1 km (0.6 mi.) from the Big Lost River channel is in error. This number more closely reflects the Idaho Chemical Processing Plant. The PBF is around 3.5 mi. from the channel.
- 6 4.4.9.2 The first paragraph indicates that the PBF site may not be acceptable because of the close proximity of the river channel. The second data indicates that no data is available concerning aquatic life in the river. Both are incorrect. The Big Lost River channel is around 3.5 mi. from the channel. Second, data does exist, see the INEL EIS. Further the Big Lost River does not flow onto the site except in years of exceptional runoff. Therefore, there is no aquatic life during normal years because there is no water in the river channel. These paragraphs need to be corrected.
- 6 4.4.9.2 The birch creek playas are only "in the general vicinity of Argonne National Laboratory-West" if you consider the INEL the general vicinity. These playas are around 3 to 4 miles from Test Area North and about 17 mi. from the PBF area and 15 mi. from ANL-W. Please correct the wording and the implications.
- 7 5.7.4 The discussion here indicates that 620 Ci of Argon-41 would be released primarily due to target processing. However, previous discussions stated that the processing facility would be located at the PBF. That is, the processing facility would have to be built. Why is the release quantity so large then? This facility would never be built if it worked so badly. This source term needs further explanation.

8 3.5 Table 3.1 needs to be reworked based on the chapter 3 comments. Consequences due to a processing facility seem to be off. This conclusion is based on primarily the fact that Sandia is very close to a major population center and the INEL is many miles (42 mi.) from the nearest large population center, but the MEI consequences for target irradiation are lower for Sandia than for the PBF. In a similar vain, the consequences for the target processing facility are nearly equal. These numbers look extremely fake.

In addition, consequences to a collocated worker are higher for a facility that has to be built at the INEL than for a facility that exists or partly exists at Sandia. Again, these number look fake. Further discussion and/or description is necessary to add credibility to the numbers in this table.

9 5.14.4 Near the middle of the first paragraph states the fuel elements would be transferred to the Irradiated Fuel Storage Facility for dry or wet storage. This facility is strictly a dry storage facility. Another facility may be available for wet storage. Please correct.

Responses to Comment Letter C062

- 1 The technical basis of the comment is substantially correct. The EIS attempted, to the extent possible, to utilize existing safety documentation and other analyses in developing accident scenarios that would represent the design basis accidents for facilities considered in the Medical Isotopes Production Project. However, the Power Burst Facility (PBF) safety analysis report (SAR) is outdated and does not contain sufficient information on radiological emissions associated with the design basis accidents evaluated in the document. Based on information contained in the PBF SAR, a coolant flow blockage in the core leading to overheating and fuel element damage was included as a credible design basis accident. This is similar to the type of accident evaluated for the Omega West Reactor (OWR) and for which a radionuclide release estimate was available. Therefore, the OWR release estimate was used to evaluate a similar accident at PBF and also at the Oak Ridge Research Reactor (ORRR) in the absence of more recent analyses specific to those facilities. The release estimates were combined with site- and facility-specific information (stack parameters, meteorology, and location with respect to potential receptors) to estimate the consequences to workers and the public from these accidents.

In addition, the estimated radionuclide releases for fuel damage scenarios (from whatever cause) at OWR and the Annular Core Research Reactor (ACRR) were similar, and use of the OWR scenario to represent emissions from an accident at PBF should bound the consequences of a design basis accident at that facility. Assuming a lower release or accident frequency based on the thermal characteristics of PBF fuel might result in a lower risk estimate; however, this would not likely change the conclusions reached in the EIS because the accident risk associated with operation of any of the facilities is low.

- 2 The access point assumed for PBF facilities is actually a thermal luminescent dosimetry (TLD) monitoring station at the area boundary. In the absence of more detailed information, it was assumed for purposes of the analysis that a member of the public could gain access to this location. The analyses presented in the EIS for consequences at the public access location following accidents at PBF are therefore more conservative (i.e., estimate a higher dose) than if the highway location were chosen. However, this would not likely change the conclusions reached in the EIS because the accident risk associated with operation of any of the facilities is low.
- 3 The distance used for the offsite receptor evaluation at SNL/NM represents the location of a full-time resident who receives the highest potential exposure to facility emissions. In some cases, meteorological conditions result in this location being other than the nearest possible access point. Also, other locations to which the public has access are not residential areas, and the exposures at these locations would be substantially lower than at a permanent residence because they are not continuously occupied.
- 4 The radiological air quality section is based primarily on information in the Spent Nuclear Fuel Programmatic Environmental Impact Statement (SNF PEIS) (DOE 1995b), which reflects site operations in 1991 with updates for some facilities that were expected to begin operation during 1995. The third sentence in the third paragraph of Section 4.4.7.2 was changed to read, "Historically, the radionuclide with the highest emission rate is the noble gas krypton-85, which was released primarily by the chemical reprocessing of spent nuclear fuel at the Idaho Chemical Processing Plant."

Radionuclide emissions from the INEL during 1994 included about 550 Ci of tritium, 2100 Ci of noble gases, less than 1 microcurie of transuranics, and about 10 Ci of other mixed fission and activation products (see 1994 INEL air emissions report to EPA [DOE 1995q]). Emissions from the PBF and the surrounding area amounted to less than 1 microcurie of mixed fission products during that time. The change in status for facilities noted in the comment is acknowledged; however, this information would not affect analyses or conclusions reached in the EIS.

- 5 Please see response to comment C062-4 above.
- 6 Sections 4.4.8.1 and 4.4.9.2 of the EIS have been changed to correctly describe the environment.
- 7 The emissions of argon-41 referred to in the comment would result from operation of the PBF to irradiate targets rather than from target processing. These emissions result from neutron activation of stable argon in the reactor cooling system. Noble gas emissions from either the reactor or target processing facility would not be affected by the type or extent of filtration systems installed in the facility exhaust because of their unreactive nature. Similar emissions were estimated for the reactors associated with other alternatives as well. The emission control systems at any facility utilized for the project would be upgraded as necessary so that they meet all Federal and state standards before operations begin.
- 8 The consequences of radionuclide releases from a particular facility are a result of the release conditions, the quantity released, meteorological conditions, and the location of receptors relative to the release point. The differences noted in the comment are a result of combining all these factors to determine radiation dose to individuals and populations. Section 5.7 and Appendix C of the EIS contain additional information about the assumptions used to estimate consequences of facility operation.

Because the emissions from medical isotope production facilities consist mainly of noble gases, which are not held up by particulate filters or other typical effluent control systems, the type of filtration system installed in the facility would have only a minimal effect on consequences to workers and the public. The emission control systems at any facility utilized for the project would be upgraded as necessary so that they meet all Federal and state standards before operations begin.

- 9 Section 5.14.4 was revised to eliminate the confusion. The Irradiated Fuel Storage Facility is a dry storage facility: other facilities at the Idaho Chemical Processing Plant could be available for wet (CPP-666) or dry (CPP-749) storage.

Mr. Wade Carroll
EIS Project Manager
Office of Nuclear Energy, Science and Technology (NE-70)
U.S. Department of Energy
19901 Germantown Rd.
Germantown, MD 20874-1290

January 1, 1996

Dear Mr. Carroll,

I have received a draft EIS for the Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes. I have read all the portions related to Sandia and Los Alamos. I find that the draft EIS more than adequately addresses any concerns I have. I think it is an accurate and in-depth document, which has been thoughtfully and carefully prepared. I do however, have some comments in regards to the draft EIS which I would like to be considered.

1 | I would first like to make clear that I am completely in favor of MIPP, and
2 | I believe that medical isotopes (specifically Tc-99) helped to save my son's life.
From my point of view, this is a vitally important project, and must go forward in
some fashion regardless to the location selected. I find that the **NO ACTION
ALTERNATIVE** is **COMPLETELY UNACCEPTABLE**, and if possible, should be
removed from the EIS as an alternative course of action. The no action
alternative does not **protect the interests of the people of the United States**. At
a previous MIPP EIS meeting I heard comments related to the possibility of
producing Tc-99 (and other isotopes) in other countries, and using these
sources for our domestic needs. The countries mentioned were Belgium and
Russia. I immediately recalled the 1973 Arab oil embargo, and the effect it had
on fuel availability and price. While we may be able to count on Belgium as a
friend, the political climate there is subject to change, which could preclude the
manufacture of these necessary isotopes. Russia is again leaning towards
communism, and they are a recent fair weather friend at best. If we leave the
hard choices to people overseas, we will end up as a nation of burger flippers,
dependent on imported beef and spatulas.

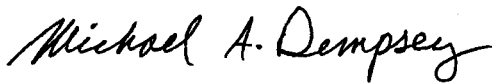
Once again I would like to state that I am entirely in favor of MIPP, but I
would like to point out some social factors about New Mexico that could
possibly be used to speed this project along. If SNL/NM is chosen for the
irradiation portion of the project you may see some opposition from the pseudo-
environmentalists and nimby's in the Albuquerque area. Most New Mexicans
are completely unaware that there any nuclear reactors in New Mexico. A few
years ago SNL wanted to dump 50,000 gallons of slightly radioactive water into

the Rio Grande. The water was reported to be less radioactive than ordinary milk. When the general public learned of the plan, the opposition was tremendous, and the objections raised were so strong that the water had to be disposed of in some by some other (much more expensive) means, after about six months of haggling.

Since I began writing this letter, recent protests confirm this perception. Anti-nuclear activists (pseudo-environmentalists) protested the MIPP plan to irradiate the targets at SNL on 1/29/96 in Albuquerque, NM. A spokesperson for the activists charged that it was a pork barrel project designed to keep secret N weapon research going, and that we could purchase our Tc-99 from Canada. You, I, and the DOE know that this is a big lie, and that this project is vitally important to our nation. When you get the comments from Los Alamos regarding this project I am sure that you will see that there is no opposition from the people who will have this project in their backyard (I can see the LLW dump from the roof of my house, it's about 700 yards away!)

I will attend the Los Alamos meeting on 2/1/96, and I am confident that the discussions I will hear **FROM THE PEOPLE OF LOS ALAMOS COUNTY** will be as before, not whether to produce these vital medicines, but as to what method to use. I implore you to proceed with this project at one of the selected locations, just do it. If some other more efficient method (linear accelerator, liquid reactor etc.) comes along, well this is America, and we will change to the most cost effective method. But for now we must push ahead, and do it. **I WOULD PREFER LOS ALAMOS, AND IT IS IN MY BACKYARD, BUT IF ANOTHER SITE IS CHOSEN, FINE! FINE! FINE! FINE! JUST DO IT!!!! DON'T LET US (UNITED STATES) RUN OUT OF THIS MEDICINE!!! MY SON MIGHT NEED IT AGAIN!! YOUR CHILD MIGHT NEED IT!!!**

Sincerely,



Michael A. Dempsey
300 Connie Ave.
White Rock, NM 87544

(505) 672-3726

Responses to Comment Letter C063

- 1 Comment noted.
- 2 Comment noted. The no action alternative is required to be analyzed under the Council of Environmental Quality's regulations implementing NEPA.

COMMENTS ON DOE/EIS-0249D
MEDICAL ISOTOPES PRODUCTION PROJECT:
MOLYBDENUM-99 AND RELATED ISOTOPES

Kent L. Brinker
755 E. 1600 N
Shelley Idaho 83274

Page 3.23 ACRR has to have new fuel made for the Mo-99 production, has the safety analysis been performed or will this be an extra cost?

Has the cost of new fuel construction and procurement been added into the costs for ACRR?

Page 3.24 Has all the safety analysis and engineering been performed for replacement of most of the reactor control systems and safety systems? It appears that almost the entire reactor controls will be redone including rod drives, instrumentation, and safety systems. Are these costs included in the startup estimates?

If the closest approach of the city limits is 1.2 miles why is 3.7 miles used in the accident and release estimates.

I do not see where the increased shipments of waste to the Nevada Test Site for ACRR and ORNL is totally addressed for safety and accidents during shipment. Only LANL and INEL have total capacity for cradle to grave waste disposal/handling. The same for target production and isotope separation.

The INEL has sufficient fuel stored at ICPP that no fuel would have to be shipped for manufacturing the targets.

Page 3.51 second paragraph: reference to Highway 26 is incorrect. The Highway is Idaho route 33. This can be closed for a shipment to TAN.

How can PBF's stainless steel clad ceramic fuel be comparable in a loss of flow accident to the aluminum clad metallic fuel of Omega West MTR type fuel? PBF FSAR allows over 2000 degrees C for fuel centerline temperature and the core/fuel is designed to reach over 1 gigawatt in a natural burst and sustain no damage. For its power PBF is probably one the safest fuels/cores ever designed and operated.

PBF has a 36" active core and a test space of 8.25" allowing use of very close to the original size of the Cintichem 16" targets. The targets can be doubled end to end in the PBF core and the test space can physically contain at least 27 targets. Were these facts taken into account for the Mo-99 production capacity of PBF?

Page viii: The statement is that no private company is available in the near term to take on Mo-99 production

7 The Idaho Brain Tumor Center IBTC has a lease on the Power Burst Facility (PBF) for Boron Neutron Capture Therapy (BNCT). IBTC is a private company. The operation of PBF for both cancer treatment and Mo-99 production is compatible. IBTC would be part of privatization from the start at PBF.

8 In a time of fiscal restraint, if all the reactors are considered to be equal in capacity and time to full production, what is the reason for ACRR to be the preferred choice when PBF would be the least costly alternative for modification and operation?

9 For a long-term solution to domestic Mo-99 supply, PBF should chosen for modification. The 12 million dollars/year for Annular Core Research Reactor (ACRR) operation would be saved. The cost for modifying PBF is millions less than the ACRR. PBF is capable of supplying much more of the amount of Mo-99 isotope needed for U.S. consumption. Using the EIS figures, ACRR costs for 5 years would be approximately 89 million dollars (including modifications). Over a period of 5 years PBF would cost the taxpayers 59 million dollars (including modifications) without IBTC participation. With IBTC participating and developing BNCT along with Mo-99 production, PBF operation/modification would cost the taxpayers approximately 33 million dollars. The difference in cost to taxpayers, 30 million/57 million dollars. These savings do not include the reduction/payback from BNCT fees to DOE. After modification/start-up of 2 years, DOE/taxpayers would have minimal or 0 costs for domestic Mo-99 production as it would be by a private company. Once BNCT is in place and patient treatment started, DOE would receive income from the fees agreed to in the long-term lease agreement with IBTC. This could possibly total up to 3 million dollars/year. DOE could utilize this income to help fund other projects such as cleanup of various sites. DOE headquarters has issued orders that all operations that are appropriate for privatization should be privatized. This project would be a perfect illustration of this principle. Not only is PBF the better choice in terms of cost to DOE/taxpayers for Mo-99, a cancer treatment facility for one of the most violent and deadly forms of cancer would be created at the same time at no additional cost to DOE/taxpayer. From an economic and technical standpoint the PBF option is the best, let alone on a humanitarian basis.

10 If a short-term small production supply is paramount, then according to the EIS information the ACRR can start to production 10-30% of the Mo-99 in a 6 month period with the removal of its experiment dry hole and fabrication of a target holder. ACRR could provide a small temporary supply while PBF is coming up to full production. No purchase of new fuel, change out of the present fuel, or replacement of controls systems would be required for this small amount of production. The existing hot cells can perform the processing for 10-30% level of operation. The funds to complete full modifications for ACRR 100% production would be saved. This option would supply Mo-99 for a minimum cost for the short-term. If there is a shutdown of Nordion supplies during the next 22 months none of the sites could produce 100% of the needed U.S. supply anyway.

Responses to Comment Letter C064

- 1 The calculations regarding the new fuel and core design have been performed, but these future changes are not adequately addressed in the current safety analysis report (SAR). The SAR will need to be updated before the core change is made. The cost of the change is factored into the SNL/NM budget. New fuel procurement has been factored into the annual operating cost of the SNL/NM facility. Costs of the modified control system have been included in the startup estimate. The safety analysis and engineering design has been completed for the control system modifications.
- 2 The distance used for the offsite receptor evaluation at SNL/NM represents the location of a full-time resident who receives the highest potential exposure to facility emissions. In some cases, meteorological conditions result in this location being other than the nearest possible access point. Also, other locations to which the public has access may not be residential areas, and the exposures at these locations would be substantially lower than at a permanent residence because they are not continuously occupied. The analysis also considers exposure to onsite workers and to members of the public at a non-residential location to which there is unrestricted access.
- 3 As described in the EIS, some transportation of Mo-99 and small quantities of low-level waste would be required at any of the alternatives considered. For some of the alternatives this transportation would take place almost exclusively onsite, while others would require use of public roads. The ORNL alternative and the preferred alternative both would require periodic shipments of low-level waste to the Nevada Test Site (NTS). An analysis of the transportation of low-level waste, irradiated targets, and finished isotopes is provided in Section 5.11 of the EIS. This analysis includes the effects of accidents during transportation of low-level waste to NTS.
- 4 The statement regarding INEL is true. It is also true for every alternative other than the option of target fabrication at SNL/NM.
- 5 Section 3.3.4.9 of the EIS has been corrected to identify the proper route.
- 6 The Power Burst Facility (PBF) does not have a current SAR based on DOE Order 5480.23. Since the existing SAR does not contain the accident analysis needed for the EIS, it was assumed that the bounding fission product release accident would be the total flow blockage of one bundle. The source term was then calculated based on the fission product inventory in one fuel bundle. The LANL Omega West reactor has a prepared SAR based on DOE Order 5480.23, and a similar accident was described there. In this aspect, that of the bounding reactor accident being a flow blockage, the two facilities are similar.

Twenty-seven targets will not arrange well uniformly in a circle. One can arrange 19 well, but the next step is 37. Uniform thermalization of the flux is the objective. Stuffing targets so they fit would not be beneficial in that several would run at very high powers and several would run at low powers. Further, with a higher metal-to-water ratio, the targets will operate at lower powers because less thermalization will take place and fewer fissions will occur. Going from a 19-target configuration to a 37-target configuration requires about 1.3 times as many targets to produce a given quantity of Mo-99 because of less thermalization. Lower power targets cause greater specific waste (waste volume per curie of Mo-99 produced). Nineteen targets is likely to work well in PBF.

Stacking the targets is not prudent because it would generate more waste. Waste generation would be higher because flux at the edge of the core is lower; the lower flux at the edge of the core means that the target ends would have low fission rates. Stacking reduces the production per target and increases the number of targets required for full production, which increases the waste produced. Nineteen targets in the center, plus a total of six in the transient rod locations, should be satisfactory for full production.

Long targets are not necessarily prudent either. Their curie content would make hot cell work difficult. A 20-inch target at a fission rate designed to yield 20 kW per target possesses 35,000 curies after a 6-day irradiation and a 6-hour cooling period. A 30-inch target would possess over 50,000 curies. While the larger target could be made to work, it is not a clear advantage. Also, it will not fit in a 55-gallon drum.

- 7 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE. The Department is aware of this potential for the INEL alternative, but IBTC has not made a formal proposal to the Department regarding the dual use of the PBF. Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.

- 8 The reasons for identifying the preferred alternative are stated in Section 3.3.1.1.

The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

- 9 Please see responses to comments C064-7 and C064-8 above.
- 10 Comment noted.

R.U.C.A. ANTI-NUCLEAR WASTE ☠

(Ruidoso Upper Canyon Association)
Dedicated to Preserving Quality of Life

P.O. Box 3553
Ruidoso, NM 88345

378-8383
301 Hwy. 70
Plaza D'Oros

Feb. 6, 1996

Mr. Wade Carroll
EIS Project Manager
Office of Nuclear Energy, Science & Technology (NE-70)
U.S. Dept. of Energy
19901 Germantown Road
Germantown, Maryland 20874-1290

Dear Mr. Carroll,

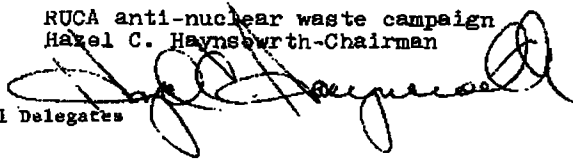
Attached please find resolutions which have been passed by the governing bodies of all towns in Southern New Mexico. I did not bother to obtain the resolutions from the rest of the State but they are there.

As you can see the citizens of New Mexico strongly object to any further storage of either hi-level or low-level nuclear waste. It is obvious that we are the dumping grounds for all of this junk which the Eastern and Middle States do not want. WE HAVE HAD ENOUGH AND WILL FURTHER PHYSICALLY PROTEST THIS LATEST ATTEMPT TO ADD TO THE CONTAMINATION WHICH WE ALREADY HAVE.

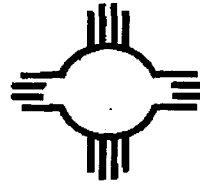
The attached poster explains our position very well and we feel that it is time that the D.O.E. quit acting like the 3 monkey fable with their attitude of "SEE NO EVIL, SPEAK NO EVIL, HEAR NO EVIL" when it comes to nuclear waste.

RUCA anti-nuclear waste campaign
Hazel C. Haynsworth-Chairman

Copies: All N.M. Congressional Delegates



**LAND OF
ENCHANTMENT ?
YES!!**



**LAND OF
NUCLEAR WASTE?
NO!!**

VILLAGE OF RUIDOSO

RESOLUTION 92-37

A RESOLUTION CALLING UPON THE UNITED STATES CONGRESS TO AVOID THE WASTEFUL EXPENDITURE OF FUNDS FOR MONITORED RETRIEVABLE STORAGE OF HIGH LEVEL NUCLEAR WASTES, REQUESTING THE CONGRESS TO CONVENE AND CONDUCT HEARINGS AND INVESTIGATION OF THE NUCLEAR WASTE MANAGEMENT PROGRAM OF THE UNITED STATES DEPARTMENT OF ENERGY, AND FURTHER REQUESTING THE HONORABLE BRUCE KING, GOVERNOR OF THE STATE OF NEW MEXICO, TO JOIN IN THIS REQUEST.

PREAMBLE

- A. The United States Department of Energy and Office of Nuclear Waste Negotiator have funded throughout the country twenty (20) "feasibility studies" of Monitored Retrievable Storage of "spent" fuel from commercial power reactors and other high level radioactive wastes. Each study grantee initially received \$100,000., awarded mostly to Native American tribes and a few County government jurisdictions. The Mescalero Apache Tribe requested and received federal funds (\$300,000.) to study the feasibility of a Monitored Retrievable Storage (MRS) facility, on or near their reservation, located adjacent to the Village of Ruidoso, New Mexico. Documented expenditures for these studies, to date, amounts to \$2.2

million.

- B. Congress' own MRS Review Commission, along with the General Accounting Office and other agencies have concluded that an MRS will not contribute significantly to, nor will it reduce costs of the Department of Energy's plans to dispose of spent fuel and other high level radioactive wastes, compared to storage of these wastes at or near the generating facility. When costs of construction and manning the MRS itself, and additional costs of infrastructure development (roadways and rail lines, including rights of way; emergency response teams, facilities and equipment; etc.) are considered, the proposed MRS represents an unacceptable level of cost to taxpayers and utility ratepayers in the billions of dollars.
- C. Waste of additional millions of dollars of taxpayers' money can be stopped by the United States Department of Energy and the Office of Nuclear Waste Negotiator ceasing activities promoting and "studying" the MRS concept.
- D. Funds saved by cessation of MRS siting and promotional activities, as well as by not constructing a costly but needless "temporary" MRS facility, may be allocated for achieving a safe, economical and environmentally sound system of permanent disposal of spent fuel and other high level radioactive wastes, as well as for other national priorities.
- E. The Governing Body of the Village of Ruidoso finds and determines that pursuit of an MRS facility is an unacceptable and unnecessary expense to taxpayers and ratepayers. The potential location of an MRS facility within 100 miles of the Village of Ruidoso would be seriously detrimental to the tourist-based economy of the Village; location of an MRS anywhere within the state would be seriously detrimental to the economy of New Mexico.
- F. The Governing Body of the Village of Ruidoso further finds and determines that the incoming Congress of the United States has a unique opportunity to save billions of ratepayers' and taxpayers' dollars by refusing to appropriate additional funds for the study or pursuit of MRS facilities. Upon careful review and revision of current policies, the new Congress also may save large sums of money by redirecting the United States Department of Energy's expenditures and efforts toward development of acceptable permanent disposal technologies.

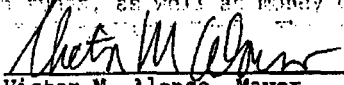
NOW THEREFORE BE IT RESOLVED BY THE GOVERNING BODY OF THE VILLAGE OF RUIDOSO THAT:

1. The Congress of the United State is respectfully requested to refuse any further appropriations or funding for study of siting Monitored Retrievable Storage facilities, thereby saving taxpayers and ratepayers billions of dollars;

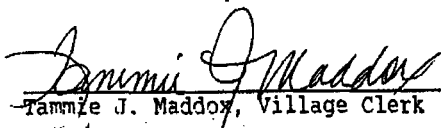
2. The Congress direct the United States Department of Energy and Office of Nuclear Waste Negotiator to adopt recommendations of Congress' Monitored Retrievable Storage Review Commission as those agencies' spent fuel management policies; and,
3. The Congress convene hearings and conduct investigation of the radioactive waste disposal and management plans of the United State Department of Energy, especially examining the manner in which that agency expends and managers appropriated funds, as well as money deposited in and drawn from the Nuclear Waste Fund. The purpose of such hearings and investigation would be to redirect the Department of Energy's efforts and expenditures to devising permanent, safe and economically acceptable solutions to the nation's radioactive waste problems; rather than pursuing costly "temporary" solutions which merely delay and avoid addressing core issues of nuclear waste disposal.

BE IT FURTHER RESOLVED that the Governor of the State of New Mexico, the Honorable Bruce King, is respectfully requested to join in this petition to the United States Congress because of the potential statewide detrimental economic effects of an MRS facility.

the United State Department of Energy, especially
PASSED, ADOPTED, AND APPROVED this 15th day of December 1992, and
money appropriated funds, as well as money deposited


Victor M. Alonso, Mayor

SEAL
ATTEST:


Tammie J. Maddox, Village Clerk

PASSED, ADOPTED, AND APPROVED this 15th day of December 1992, and

**STATE OF NEW MEXICO'S POSITION
ON
MONITORED RETRIEVABLE STORAGE
(MRS)**

PRESENTED TO

**RADIOACTIVE AND HAZARDOUS MATERIALS COMMITTEE
NEW MEXICO STATE LEGISLATURE**

**JUNE 24, 1994
SANTA FE, NEW MEXICO**

BY

**KATHLEEN SISNEROS, DIRECTOR
WATER AND WASTE MANAGEMENT DIVISION
NEW MEXICO ENVIRONMENT DEPARTMENT**

AND

**CHRIS WENTZ, CO-COORDINATOR
RADIOACTIVE WASTE CONSULTATION TASK FORCE
STATE OF NEW MEXICO**

COMMISSION/ADMINISTRATION
(505) 437-7427

DATA PROCESSING
(505) 434-4246

INQUIRY
(505) 434-4602

ROAD/GEOSGRAPHIC
INFORMATION SYSTEM
(505) 437-7636

FAX (505) 437-6342



State of New Mexico
County of Otero

1000 NEW YORK AVE., RM. 101
ALAMOGORDO, NM 88313-6938

RESOLUTION

NO. 80-34

RE: Location of an MRS site in Otero County
on or near the Mescalero Apache
Reservation

WHEREAS, The Board of County Commissioners has received input from the citizens of Otero County, demonstrating a high level of concern and opposition regarding the location of an MRS site on or near the Mescalero Reservation; and

WHEREAS, The Board of County Commissioners recognizes the sovereignty of the Mescalero Indian Nation when it is conducting Tribal affairs on Tribal lands; and

WHEREAS, The Board of County Commissioners nevertheless recognizes the fact that the actions of the Tribal Council with respect to the location of an MRS site on or near Tribal lands within Otero County impact the interests and concerns of both Tribal members and their neighbors, all of whom are citizens of this county; and

WHEREAS, As a result of the concerns and opposition that have been voiced to this Commission, several areas of common interest have come to light which warrant a request for additional information. Some immediate concerns are:

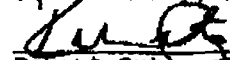
- 1) site safety;
- 2) transportation systems safety;
- 3) emergency response capability;
- 4) medical treatment facility status;
- 5) sanitation and sewer facility requirements;
- 6) funding mechanisms for any of the above;
- 7) funding mechanisms for necessary infrastructure development and maintenance outside the Reservation boundaries;
- 8) health risks posed by the site location under normal operation;
- 9) health risks posed by the site location in the event of a catastrophic failure on-site or in transportation of materials;
- 10) economic impact of site location in this tourism industry region;
- 11) economic benefits to be derived outside of the reservation boundaries by location of the site on or near the Mescalero Reservation;

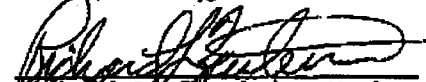
- 12) a full environmental assessment which addresses all of the concerns expressed herein;
- 13) the effect of site location on the population growth of the region;

NOW THEREFORE, BE IT HEREBY RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF OTERO COUNTY that this resolution be presented to the Mescalero Tribal Council and the Department of Energy as a request that either one or both of these entities provide Otero County with any and all information currently in their possession or which may come into their possession in the future with respect to the possible location of an MRS site on or near the Mescalero Reservation which addresses any of the concerns expressed herein.

In addition, the Board of County Commissioners requests that any further study for possible sites to locate an MRS facility on or near the Mescalero Reservation addresses all of the concerns expressed herein and that the Board of County Commissioners have an opportunity to provide input and information in all areas of concern that impact the delivery of services to the public.

BOARD OF COUNTY COMMISSIONERS
Otero County, New Mexico


Robert Ortiz, Chairman


Richard L. Zierlein, Member


Dorothy H. Mills, Member

ATTEST:


Dianna Duran
Otero County Clerk

SUMMARY OF MAJOR POINTS

- **THE STATE OF NEW MEXICO HAS A SINCERE AND LONG-STANDING RESPECT FOR INDIAN TRIBAL SOVEREIGNTY**

- **THE STATE OF NEW MEXICO OPPOSES THE SITING OF AN MRS FACILITY ANYWHERE WITHIN ITS BORDERS**
 - **OPPOSITION IN NEW MEXICO IS STRONG AND BROAD-BASED**

 - **REASONS ARE MANY AND VARIED**

- **THE STATE OF NEW MEXICO BELIEVES A RE-EVALUATION OF THE NATION'S CURRENT PROGRAM FOR STORAGE AND DISPOSAL OF SPENT NUCLEAR FUEL IS NEEDED**
 - **DEVELOPMENT OF A PRIVATE MRS FACILITY WILL ONLY COMPLICATE AND IMPEDE PROGRESS ON RESOLUTION OF THE PROBLEM**

OPPOSITION IN NEW MEXICO TO AN MRS IS STRONG AND BROAD-BASED

- THE FOLLOWING ELECTED STATE OFFICIALS ALL OPPOSE SITING OF AN MRS FACILITY ANYWHERE IN NEW MEXICO:

GOVERNOR BRUCE KING¹
U.S. SENATOR JEFF BINGAMAN (D-NM)
U.S. SENATOR PETE V. DOMENICI (R-NM)
U.S. CONGRESSMAN STEVEN SCHIFF (R-NM)
U.S. CONGRESSMAN JOSEPH R. SKEEN (R-NM)²
U.S. CONGRESSMAN BILL RICHARDSON (D-NM)

- THE NEW MEXICO SENATE PASSED A MEMORIAL (SENATE MEMORIAL 4, 41st LEGISLATURE, FIRST SESSION, 1993) OPPOSING ESTABLISHMENT OF AN MRS IN THE STATE OF NEW MEXICO
- THE NEW MEXICO HOUSE OF REPRESENTATIVES PASSED A MEMORIAL (HOUSE MEMORIAL 66, 40th LEGISLATURE, SECOND SESSION, 1992) OPPOSING ESTABLISHMENT OF AN MRS IN NEW MEXICO

¹ See Governor's Office News Advisory of February 3, 1994; and Governor King's Congressional Testimony of March 17, 1994 (attached)

² The Mescalero Apache Reservation is located in Representative Skeen's congressional district.

**NEW MEXICO OPPOSITION TO THE MRS PREDATES
MESCALERO TRIBE INVOLVEMENT**

- FORMER NEW MEXICO GOVERNOR GARREY CARRUTHERS VOTED IN SUPPORT OF AN MRS RESOLUTION PASSED UNANIMOUSLY BY THE WESTERN GOVERNORS' ASSOCIATION (WGA) IN 1989
- CURRENT NEW MEXICO GOVERNOR BRUCE KING VOTED IN SUPPORT OF THE READOPTION OF THIS SAME RESOLUTION IN 1993
- THIS WGA RESOLUTION (RESOLUTION #89-024) STATES THAT THE WESTERN GOVERNORS:
 - SUPPORT THE NATIONAL POLICY OF SAFE, PERMANENT, GEOLOGIC DISPOSAL
 - ENDORSE AT-REACTOR DRY STORAGE, WHERE STORAGE IS PERMISSIBLE UNDER STATE LAW
 - OPPOSE THE SITING OF ANY MRS WITHIN THE GEOGRAPHIC BOUNDARIES OF A STATE WITHOUT THE WRITTEN CONSENT OF ITS GOVERNOR

- SITING AN MRS IN NEW MEXICO IS INEQUITABLE
 - THERE ARE NO COMMERCIAL NUCLEAR REACTORS LOCATED IN THE STATE OF NEW MEXICO
 - STATES THAT HAVE REACTORS AND HAVE THEREFORE BENEFITTED FROM THE GENERATION OF COMMERCIAL NUCLEAR POWER MUST CONTINUE TO TAKE RESPONSIBILITY FOR THEIR OWN WASTES UNTIL PERMANENT DISPOSAL CAPACITY IS AVAILABLE
- NEW MEXICO HAS DONE ITS SHARE, MAKING SIGNIFICANT CONTRIBUTIONS TO BOTH THE ENERGY AND DEFENSE SECURITY OF THE UNITED STATES BY:
 - HOSTING AND MAINTAINING TWO OF THE FEDERAL GOVERNMENT'S NUCLEAR WEAPONS RESEARCH, DEVELOPMENT AND TESTING FACILITIES FOR OVER 50 YEARS
 - SERVING AS A POTENTIAL SITE FOR THE PERMANENT DISPOSAL OF DEFENSE TRANSURANIC RADIOACTIVE WASTE AT WIPP
 - PROVIDING THE VAST MAJORITY OF U.S. URANIUM MINING AND MILLING CAPACITY
- NEW MEXICO HAS REAPED BENEFITS FROM THESE U.S. NUCLEAR PROGRAMS, BUT ALSO BEARS THE LEGACY OF REAL/PERCEIVED ADVERSE IMPACTS ASSOCIATED WITH THESE ACTIVITIES

**PRIVATE MRS COMPLICATES AND CONFLICTS WITH THE
FEDERAL PROGRAM**

- THERE IS LEGITIMATE AND PRUDENT NATIONAL INTEREST IN THE FEDERAL GOVERNMENT ' S RETENTION OF SPENT FUEL MANAGEMENT
 - CRITICAL LINKAGES TO REPOSITORY PROGRAM
 - TRANSPORTATION SAFEGUARDS
 - PUBLIC INVOLVEMENT
- SITING OF A PRIVATE MRS DOES NOT CONSIDER:
 - OPTIMIZATION OF TOTAL WASTE SYSTEM
 - RISK AVOIDANCE OR MINIMIZATION
 - COST-EFFECTIVENESS
- HOST OF A PRIVATE MRS LARGELY DETERMINES CONFIGURATION AND SCOPE OF OPERATIONS
 - LIMITED SYSTEM INTEGRATION
 - NO REPACKAGING OR SHIPMENT "STAGING" BENEFITS

**THERE ARE SERIOUS CONCERNS RELATED TO THE SITING
AND OPERATION OF AN MRS FACILITY IN NEW MEXICO**

- **THESE CONCERNS INCLUDE POTENTIAL IMPACTS ON:**
 - **PUBLIC HEALTH AND SAFETY**
 - **ENVIRONMENT**
 - **ECONOMY**

- **THE PROPOSED MESCALERO SITE POSES UNIQUE PROBLEMS:**
 - **LIMITED INFRASTRUCTURE CAPACITY**
 - **LIMITED EMERGENCY RESPONSE CAPABILITY**
 - **NO RAIL ACCESS**
 - **FRAGILE ENVIRONMENT**
 - **TOURISM-BASED ECONOMY**

OFFICE OF THE GOVERNOR

STATE CAPITOL
SANTA FE, NEW MEXICO 87503

BRUCE KING
GOVERNOR

505 327-3000

TESTIMONY OF GOV. BRUCE KING OF NEW MEXICO
TO THE U.S. HOUSE OF REPRESENTATIVES'
SUBCOMMITTEES ON ENERGY AND MINERAL RESOURCES
AND OVERSIGHT AND INVESTIGATIONS
OF THE COMMITTEE ON NATURAL RESOURCES

March 17, 1994
9:30 a.m., 1324 Longworth House Office Building

Thank you, Chairman Miller, Chairman Lehman, and Representatives, for giving me the opportunity to express my views to you on the possible construction of a Monitored Retrievable Storage (MRS) facility for nuclear waste on the Mescalero Apache Reservation in New Mexico.

I have been notified that the Mescalero Apache tribe and Northern States Power Company of Minnesota have entered an agreement to consider such a facility and that discussions are being held with other utility companies about the project.

Representatives of the Mescalero Tribe first approached me in October of 1991 about a study of an MRS facility on their lands. I told them that I respected their self-governing treaty status and their right to conduct these kinds of discussions. I also told them that I was adamantly opposed to an MRS facility in New Mexico and would do whatever I could as Governor to prevent the construction of such a facility in our state.

Since then, both houses of the New Mexico Legislature have passed memorials opposing an MRS and many of the local governments in the vicinity of the Mescalero Reservation have taken similar action. Furthermore, the Western Governors' Association has adopted two policy resolutions which, among other things, call for a demonstration of the safety and cost advantage of an MRS facility before the construction of any such facility, endorse at-reactor dry storage, and oppose the siting of any MRS within the geographic boundaries of a state without the consent of that state's Governor.

Because the health and safety of all New Mexicans might be affected by an MRS project, I do not believe the state and its citizens should be left out of the process of selecting sites and establishing conditions.



OFFICE OF THE GOVERNOR
STATE CAPITOL
SANTA FE, NEW MEXICO 87503

BRUCE KING
GOVERNOR

(505) 927-3000

June 1, 1994

Honorable William J. Clinton
President of the United States
The White House
Washington, D. C. 20202

RE: National Nuclear Waste Management Policy

Dear Mr. President:

I am deeply concerned about the Nation's policy regarding the management of spent nuclear fuel generated by commercial reactors, especially as it relates to the interim storage of this waste. The Nation needs your leadership on this issue.

You are aware a private spent nuclear fuel storage facility is being proposed by the nuclear utility industry and the Mescalero Apache Tribe for construction and operation on the reservation lands in south-central New Mexico. Such a proposal is the direct result of the lack of an effective National policy for the management of spent nuclear fuel. While I have the greatest respect for the sovereignty of the Mescalero Tribe, the siting of such a facility in New Mexico will pose undue risks for the citizens of New Mexico. I strongly oppose the siting of a spent fuel storage facility anywhere in the State of New Mexico.

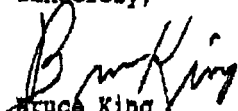
I urge your Administration to clarify its policies and effectively address the following issues.

- A National Nuclear Waste Management Policy is Needed. I do not believe that an away-from-reactor interim storage facility, especially as proposed by the Mescaleros, will have cost and safety advantages over continued at-reactor storage (or other options yet to be considered). I question whether such a facility will even alleviate short-term storage needs. No comprehensive comparative risk (or cost) analyses have been conducted to date on the soundness of such a facility, and its contribution to an integrated, National waste management system. These issues must be examined and a National integrated waste

lands, many other federal agencies must also be involved in the development and implementation of a National policy on this issue. For far too long there has been an absence of coordination at the federal level regarding the management of the Nation's nuclear waste. The lack of an effective program calls into question the federal government's trust and credibility with respect to achieving progress on a pressing National concern: permanent disposal of nuclear waste.

I encourage your Cabinet to put forth a coordinated position to respond to the mandates Congress has given the Executive branch. I strongly urge your Administration to work with Congress to place a moratorium on actions related to this issue until an effective National policy for management of spent fuel is in place.

Sincerely,


Bruce King
Governor

cc:

United States Senator Jeff Bingaman
United States Senator Pete V. Domenici
United States Congressman Steven Schiff
United States Congressman Joe R. Skee
United States Congressman Bill Richardson
Senator Max Baucus, Chairman, Senate Environment and Public
Works Committee
Congressman George Miller, Chairman, House Natural Resources
Committee
Secretary Hazel O'Leary, U.S. Department of Energy
Administrator Carol Browner, U.S. Environmental Protection
Agency
Ivan Selin, Chairman, Nuclear Regulatory Commission

VILLAGE OF RUIDOSO

RESOLUTION 92-2

A RESOLUTION REQUESTING THE LEGISLATURE OF
THE STATE OF NEW MEXICO TO ADOPT A RESOLUTION
OPPOSING THE SITING OF MONITORED RETRIEVABLE
STORAGE (MRS) OF HIGH LEVEL NUCLEAR WASTE.

WHEREAS, the Mescalero Apache Indian Tribe has received a \$100,000 grant from the U.S. Department of Energy to study the feasibility of the siting of a Monitored Retrievable Storage (MRS) facility for the storage of high-level nuclear waste; and

WHEREAS, the Mescalero Apache Indian Tribe is actively undertaking the activities outlined in Phase 1 of the grant from the federal government; and

WHEREAS, published reports have identified three (3) sites that the Tribe is considering for placement of the Monitored Retrievable Storage (MRS), all of which are within relatively close proximity to the Village of Ruidoso; and

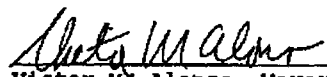
WHEREAS, it is anticipated that the formal decision by the Mescalero Apache Tribal Council as to whether or not the Tribe will pursue Phase 2 of the (MRS) process will be made this month; and

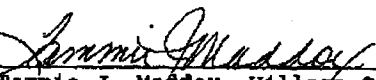
WHEREAS, the Village of Ruidoso is extremely concerned about the potential socio-economic and environmental impact that the siting of a (MRS) facility would have on the Village; and

WHEREAS, Governor King has denied the Village of Ruidoso's request to apply for a federal grant to assess the potential detrimental effects that a (MRS) would have on the Village, but has stated that he would give his wholehearted support to a resolution of the legislature opposing high-level nuclear waste storage as well as committing the full resources of his administration in-lieu-of the grant.

NOW, THEREFORE, BE IT RESOLVED by the Village Council of the Village of Ruidoso that the State Legislature adopt a resolution opposing the siting of a Monitored Retrievable Storage (MRS), in New Mexico and allocate any resources necessary to assess the detrimental effects of the placement of a (MRS), in New Mexico.

PASSED, ADOPTED AND APPROVED this 14th day of January, 1992.


Victor M. Alonso, Mayor

ATTEST: 
Tammie J. Maddox, Village Clerk

RESOLUTION NO. 1992- 11

A RESOLUTION OPPOSING THE
ESTABLISHMENT, LOCATION OR SITING OF
A MONITORED RETRIEVABLE STORAGE
FACILITY IN SOUTHERN NEW MEXICO

WHEREAS, the United States Department of Energy has encouraged Indian tribes in the United States to act as hosts for the storage of high-level nuclear waste materials;

WHEREAS, the United States Department of Energy has offered attractive financial incentives to Indian tribes in the United States which apply as to act as hosts for the storage of high-level nuclear waste materials and which agree to establish, locate or site the above-ground storage facilities [known as Monitored Retrievable Storage facilities] on Indian-owned or Indian-leased lands;

WHEREAS, the Mescalero Apache Tribe has applied for, and received, grants from the United States Department of Energy to study the possibility of hosting a Monitored Retrievable Storage facility;

WHEREAS, the governing body of the City of Alamogordo, New Mexico, recognizes and respects the right of the Mescalero Apache Tribe to study the possibility of hosting a Monitored Retrievable Storage facility and to wisely use lands and natural resources;

WHEREAS, the governing body of the City of Alamogordo, New Mexico shares the concerns which prompted its counterparts in the Villages of Ruidoso and Ruidoso Downs, the Town of Carrizozo and the Counties of Lincoln and Chavez to express opposition to the establishment, location or siting of a Monitored Retrievable Storage facility in Southern New Mexico;

WHEREAS, the governing body of the City of Alamogordo, New Mexico is deeply concerned that the prospect of the establishment, location or siting of a Monitored Retrievable Storage facility in Southern New Mexico may have a negative effect on economic development in the City of Alamogordo, New Mexico; and

WHEREAS, the governing body of the City of Alamogordo, New Mexico, based on its current understanding, believes that the establishment, location or siting of a Monitored Retrievable Storage facility in Southern New Mexico presents the possibility of damage to the environment and the potential of adverse impact upon tourism and recreation.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE CITY OF ALAMOGORDO, NEW MEXICO that it opposes the establishment, location or siting of a Monitored Retrievable Storage facility in Southern New Mexico;

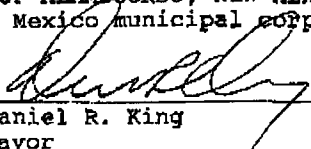
NOW THEREFORE, BE IT FURTHER RESOLVED BY THE GOVERNING BODY OF THE CITY OF ALAMOGORDO, NEW MEXICO that it welcomes ongoing dialogue between the City of Alamogordo, New Mexico and the Mescalero Apache Tribe regarding development of the Monitored Retrievable Storage facility.

NOW THEREFORE, BE IT FURTHER RESOLVED BY THE GOVERNING BODY OF THE CITY OF ALAMOGORDO, NEW MEXICO that copies of this Resolution be transmitted to the elected officials of the Mescalero Apache Tribe, to all elected officials of all municipal and county governments in Southern New Mexico, to the Governor of New Mexico,

to the New Mexico Congressional Delegation, to the Office of the Federal Waste Negotiator, to the Secretary of the United States Department of Energy and to the President of the United States.

PASSED, APPROVED AND ADOPTED THIS 28 day of April, 1992.

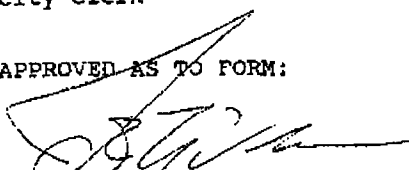
CITY OF ALAMOGORDO, NEW MEXICO,
a New Mexico municipal corporation

By: 
Daniel R. King
Mayor

ATTEST:


Angie J. Rahm
City clerk

APPROVED AS TO FORM:


John Paul Weber
City Attorney

0743.000

TOWN OF CARRIZOZO
RESOLUTION 92-01

WHEREAS, the Mescalero Apache Tribe has expressed in interest in determining the advisability of hosting a Monitored Retrievable Storage (M.R.S.) Facility through obtaining funds for a feasibility study from the U. S. Department of Energy; and

WHEREAS, the Board of Trustees of the Town of Carrizozo recognizes and respects the sovereignty of the Mescalero Apache Tribe and their right to self-determination through the wise use of their own resources; and

WHEREAS, the Mescalero Apache Tribe is actively undertaking the activities outlined in Phase 1 of the grant from the federal government; and

WHEREAS, published reports have identified three (3) sites that the Tribe is considering for placement of the M.R.S., all of which are within relatively close proximity to the Town of Carrizozo; and

WHEREAS, it is anticipated that the formal decision by the Mescalero Apache Tribal Council as to whether or not the Tribe will pursue Phase 2 of the M.R.S. process will be made this month; and

WHEREAS, the Board of Trustees of the Town of Carrizozo has determined that both the feasibility study and the prospect of housing nuclear waste on the Mescalero Reservation or surrounding environs will have a chilling effect on the prospect of economic development in Lincoln County; and

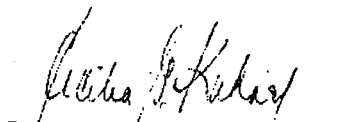
WHEREAS, the Board of Trustees of the Town of Carrizozo had determined that the prospect of housing nuclear waste on the Mescalero Apache Reservation or surrounding environs has a potential disastrous effect on the environment of this area.

NOW THEREFORE BE IT RESOLVED by the Board of Trustees of the

Town of Carrizozo to oppose the further study and any other action leading up to the establishment of a Monitored Retrievable Storage Facility on the Mescalero Reservation; and

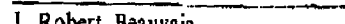
BE IT FURTHER RESOLVED that the State Legislature adopt a resolution opposing the siting of a Monitored Retrievable Storage (M.R.S.) and allocate any resources necessary to assess the detrimental effects of the placement of an M.R.S. in the State of New Mexico; and

BE IT FURTHER RESOLVED that a copy of this Resolution be sent to the Mescalero Tribe, New Mexico's Congressional Delegation, and the Governor of the State of New Mexico expressing such opposition.


Cecilia Kuhael, Mayor


Carol Schlarb, Village Clerk

APPROVED AS TO FORM:


J. Robert Beauvais
Village Attorney

Village of Capitan
RESOLUTION 92-2

WHEREAS, the Mescalero Apache Tribe has expressed an interest in determining the advisability of hosting a Monitored Retrievable Storage (M.R.S.) Facility through obtaining funds for a feasibility study from the U. S. Department of Energy; and

WHEREAS, the Board of Trustees of the Village of Capitan recognizes and respects the sovereignty of the Mescalero Apache Tribe and their right to self-determination through the wise use of their own resources; and

WHEREAS, the Mescalero Apache Tribe is actively undertaking the activities outlined in Phase 1 of the grant from the federal government; and

WHEREAS, published reports have identified three (3) sites that the Tribe is considering for placement of the M.R.S., all of which are within relatively close proximity to the Village of Capitan; and

WHEREAS, it is anticipated that the formal decision by the Mescalero Apache Tribal Council as to whether or not the Tribe will pursue Phase 2 of the M.R.S. process will be made this month; and

WHEREAS, the Board of Trustees of the Village of Capitan has determined that both the feasibility study and the prospect of housing nuclear waste on the Mescalero Reservation or surrounding environs will have a chilling effect on the prospect of economic development in Lincoln County; and

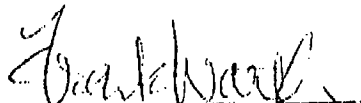
WHEREAS, the Board of Trustees of the Village of Capitan has determined that the prospect of housing nuclear waste on the Mescalero Apache Reservation or surrounding environs has a potential disastrous effect on the environment of this area.

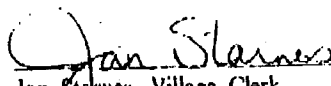
NOW THEREFORE BE IT RESOLVED by the Board of Trustees of the

Village of Capitan to oppose the further study and any other action leading up to the establishment of a Monitored Retrievable Storage Facility on the Mescalero Reservation; and

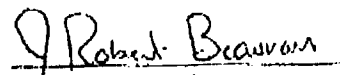
BE IT FURTHER RESOLVED that the State Legislature adopt a resolution opposing the siting of a Monitored Retrievable Storage (M.R.S.) and allocate any resources necessary to assess the detrimental effects of the placement of an M.R.S. in the State of New Mexico; and

BE IT FURTHER RESOLVED that a copy of this Resolution be sent to the Mescalero Tribe, New Mexico's Congressional Delegation, and the Governor of the State of New Mexico expressing such opposition.


Frank Warth, Mayor


Jan Starnes, Village Clerk 1-29-90

APPROVED AS TO FORM:


J. Robert Beauvais
Village Attorney

RESOLUTION NO. 80-39

WHEREAS, the Lincoln County Board of Commissioners has a long tradition of protecting and preserving the natural resources, as well as the cultural, historical and economic values of Lincoln County; and

WHEREAS, a primary responsibility of County Government is to promote the economic development of the County through establishment of policies regarding the highest and best use of private and public lands, other natural resources and the human resources represented by the citizenry of Lincoln County; and

WHEREAS, the Lincoln County Board of Commissioners is embodied with wide ranging authority through its inherent police powers to protect the health, welfare and safety of its citizenry; and

WHEREAS, the Lincoln County Board of Commissioners recognizes and respects the sovereignty of the Mescalero Apache Tribe and their right to self-determination through the wise use of their own resources; and

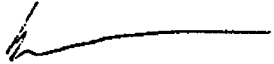
WHEREAS, the Mescalero Apache Tribe has expressed an interest in determining the advisability of hosting a Monitored Retrievable Storage (M.R.S.) Facility through obtaining funds for a feasibility study from the U. S. Department of Energy; and

WHEREAS, the Lincoln County Board of Commissioners has determined that both the feasibility study and the prospect of housing nuclear waste on the Mescalero Reservation or surrounding environs will have a chilling effect on the prospect of economic and cultural development in Lincoln County.

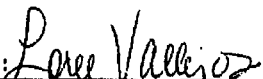
NOW THEREFORE BE IT RESOLVED by the Lincoln County Board of Commissioners to oppose any action leading up to the establishment of a Monitored Retrievable Storage Facility on the Mescalero Reservation or Mescalero tribal lands in/or adjacent to Lincoln County; and

BE IT FURTHER RESOLVED that a copy of this Resolution
be sent to the Mescalero Tribe, New Mexico's Congressional
Delegation, and the Governor of the State of New Mexico
expressing such opposition.

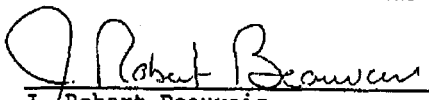
BOARD OF COMMISSIONERS
OF LINCOLN COUNTY


Stirling Spencer
CHAIRMAN


Bill Elliott
Member

BY:  Chief Deputy Clerk
MARTHA MCKNIGHT PROCTOR
Lincoln County Clerk

APPROVED AS TO LEGAL FORM AND SUFFICIENCY:


J. Robert Beauvais
Lincoln County Attorney

Date: December 17, 1991

Responses to Comment Letter C065

Please note that the attachment received by DOE titled "State of New Mexico's Position on Monitored Retrievable Storage" contained only the odd-numbered pages of the presentation.

- 1 The quantity of waste generated by the Mo-99 program at any of the alternatives is presented in Section 5.14 and is considered to be small. The storage and disposal of the low-level waste will take place at the Nevada Test Site for the SNL/NM and ORNL alternatives. The LANL and INEL alternatives would dispose of the low-level waste onsite in existing DOE-approved facilities. All the alternatives have on-going laboratory-wide waste management and minimization programs.

As discussed in Section 5.14, all alternatives considered have onsite capabilities sufficient to store spent nuclear fuel (SNF) generated in operating at 100% U.S. demand for at least 5 years. Long-term storage and disposal of the Department's SNF will be conducted in accordance with the Department's Record of Decision for the Spent Nuclear Fuel Programmatic Environmental Impact Statement (DOE 1995b).



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

DON SUNDQUIST
GOVERNOR

DON DILLS
COMMISSIONER

February 9, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
US Department of Energy
Office of Isotope Production and Distribution, NE-70
199901 Germantown Road
Germantown, Maryland 20874

Dear Mr. Carroll:

As the Lead Contact for National Environmental Policy Act (NEPA) state reviews, I am responding on behalf of the State of Tennessee to the *Draft Medical Isotopes Production Project: Molybdenum-99 and Related Medical Isotopes, Environmental Impact Statement, DOE/EIS-0249D, dated December 1995.*

The enclosed comments provided by our Division for DOE Oversight constitute the concerns, observations and policy positions on behalf of the State of Tennessee.

Please make special note of our belief that the Oak Ridge alternative is a much more viable alternative than indicated by DOE's initial preferences and evaluation. At a minimum, the final EIS should address more specific and objective reasons, benefits and tradeoffs for locating this facility at sites other than Oak Ridge.

Your consideration of the interests of the State of Tennessee is greatly appreciated.

Sincerely,


Don Dills

Enclosures

- c: The Honorable Congressman Zach Wamp, Third District (each with enclosures)
Commissioner William A. Dunavant, Jr.
Leonard Bradley, Governor's Office
Ken Bunting, Administrator
Earl Leming, DOE-Oversight
Dodd Galbreath (NEPA coordination file)

LET-DDA.DOC
02/09/96



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DOE OVERSIGHT DIVISION
761 EMORY VALLEY ROAD
OAK RIDGE, TENNESSEE 37830-7072

January 29, 1996

Mr. Don Dills, Commissioner
Tennessee Department of Environment and Conservation
c/o Tennessee Environmental Policy Office
14th Floor L&C Tower
401 Church Street
Nashville, Tennessee 37243 - 1553

Dear Commissioner Dills

Document NEPA Review -- Draft Medical Isotopes Production Project: Molybdenum-99 and Related Medical Isotopes Environmental Impact Statement, DOE/EIS-0249D, dated December 1995.

The Tennessee Department of Environment and Conservation, DOE Oversight Division has reviewed the above document for your concurrence and transmittal to the following DOE office:

Mr. Wade Carroll, MIPP-EIS Document Manager
U.S. Department of Energy
Office of Isotope Production and Distribution, NE-70
199901 Germantown Road
Germantown, Maryland 20874

Our office review was conducted in accordance with the requirements of the National Environmental Policy Act (NEPA) and implementing regulations 40 CFR 1500 - 1508 and 10 CFR 1021.

After review and research, the Division recommends DOE reconsider the Oak Ridge Research Reactor for this project preferred alternative. The technical and economic considerations combined with ORNL's 50 year history of medical isotope production experience, and additional benefits of the experimental facilities at the Oak Ridge Research Reactor should be completely evaluated.

Commissioner Dills
Page Two
January 29, 1996

Also, we request the attached comments on the above document be given full consideration in the preparation of the Final Environmental Impact Statement for Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes.

If you have any questions, please contact Dale Rector at (423) 481-0995 or Steve Nisley at (423) 481-0163.

Sincerely



Earl C. Leming, Director

Attachment

el0194.99

Tennessee Department of Environment and Conservation/DOE Oversight Division

**Comments on Draft Environmental Impact Statement, DOE/EIS-0249D, December 1995,
"Medical Isotopes Production Project: Molybdenum-99 and Related Medical Isotopes."**

GENERAL COMMENTS

3 | ORNL must be considered a strong contender for the medical isotope project. Information throughout the document states ORNL not only is cost competitive, but has more years experience in isotope and medical isotope production than any other candidate site. Most importantly, the Oak Ridge Research Reactor could continuously supply the needed isotopes during times of national emergency.

4 | DOE should weigh into it's decisionmaking the additional benefits of the Oak Ridge Research Reactor for experimental uses, and that operational costs would be offset from users of the experimental facilities. Restart would extend the useful life, avoid the estimated \$500,000 to \$700,000 per year environmental restoration mortgage payments to maintain the shutdown facility. It is unlikely that decontamination will occur before 2020.

5 | Based on the technical information, discussion, and the comparison of alternatives tables provided in the document, Oak Ridge facilities appear to be the viable candidate both from the point of operating and maintaining a plant specializing in the production of isotopes as well as technical know-how that could accommodate other isotopes if needed. It has the potential to meet 100% use requirements of the isotope in the United States with a twenty-percent increase in the production for any emergencies. Also, ORNL is an officially Food and Drug Administration certified "drug establishment."

7 | The production unit should be centrally located to minimize the travel time and distance to destination and the ideal candidate would be the one with the least distance. Oak ridge National Laboratory seems to have ideal location for dispatching the finished products by its proximity to the airport as well as the time and distance considerations. The truck transportation accident impact to the public is reported at .03 person -rem versus .05 person-rem for LANL and SNL/NM alternatives.

9 | Information provided in the document for the four candidate sites is not consistent in evaluations. If the document is to be properly evaluated for the most suitable site, information needs to be provided using the same reference criterion. Two examples in Section 4 are the total mass of spent nuclear fuel and volume of low-level generated wastes cumulative to 1993.

10 | Provide a life cycle cost evaluation for the construction and operation for all the alternatives.

11 | Los Alamos National Laboratory and Sandia National Laboratories are cited as DOE's preferred alternatives. The reasoning for this is not very clear from the document.

Under air quality, data for different sites in different years cumulative and average releases of uranium over the period of similar use or production experience would be more meaningful for site assessment.

DOE should make clear that the Annular Core Research Reactor can only operate at 10% production after becoming operational within 6 months from the Record of Decision. It should be noted that production would remain at 10% at the Annular Core Research Reactor until 28 months for full production. This is within two months of the time needed for full production at the Oak Ridge Research Reactor.

Specific Comments

1. Page 4.20 and Page 4.46

Provide the total mass of spent nuclear fuel at SNL/NM and LANL in the same manner as described for ORNL on Page 4.70, Section 4.3.14.1

2. Page 3.22 Required Modification at LANL and Page 3.45 Required Modification at Oak Ridge

The two sites parallel each other, yet the schedule for modification lists Oak Ridge requiring thirty months for operation of the facility versus LANL and SNL which have a 20 and 28 month time specified for full production. Since SNL is not certified by the Food and Drug Administration as a Drug Establishment, and certification takes time, the schedule time as tabulated in Table 3-2 is misleading. Also, the breakdown of the events leading to the production phase should be presented for every candidate site. Please provide this information for ORNL.

3. Page 3.26, Conversion of Annular Core Research Reactor to Support Defense Program Mission

Please provide information on the current program jurisdiction of the Annular Core Research Reactor. Detail a contingency plan for isotope production should the reactor be called to service for the Office of Defense Programs. If the Office of Defense Programs has the same type of retained rights (as the Annular Core Research Reactor) at the other candidate sites, please state the effected reactors or indicate this is unique to the SNL/NM site.

4. Page 3.45, Oak Ridge Research Reactor Modifications

Please provide information on if the proposed project will require upgrades to the Oak Ridge Research Reactor low-level waste piping system, as waste lines currently do not meet standards.

5. Page 4.70. Section 4.3.14.2

The Oak Ridge Reservation has all three sites (K-25, Y-12, and ORNL) included for the total cumulative volume of low-level waste disposed of through 1993. Provide the same information for SNL/NM.

6. Page 3.70. Table 3-2

The "Schedule Comparison Category" for SNL/NM, LANL, and INEL lists time frames from Record of Decision to initial target irradiation, reactor operation, Moly-99 production, and initial production. Please provide the same type of information for ORNL.

7. Page 5.100. Paragraph 1

Please identify those facilities that would have decommissioning costs funded by the Department of Defense programs for all alternative sites.

8. Page 5.100. Table 5-52 Comparison of Estimated Project Cost at Candidate Sites

Please provide estimated operational costs offset at ORNL due to the usage of the experimental facilities at the Oak Ridge Research Reactor.

Responses to Comment Letter C066

- 1 The EIS was prepared to analyze the environmental impacts of reasonable alternatives for conducting the proposed action. The Department will compare the environmental impacts and other factors related to the alternatives and will issue a Record of Decision, which will document the basis for the Department's eventual selection of an alternative.
- 2 Comment noted. The Department recognizes that ORNL, LANL, and INEL have significant isotope production experience.
- 3 As stated in Section 5.22, the estimated cost of restarting and operating the Oak Ridge Research Reactor is the highest of the alternatives analyzed. ORNL, LANL, and INEL all have significant isotope production and distribution experience. All of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99.
- 4 The EIS presents cost information only for the proposed Medical Isotopes Production Project at each of the alternatives. The Department recognizes that facilities proposed for use in all of the alternatives under consideration could conduct other cost-sharing activities; however, these other cost-share activities and their impacts are outside the scope of the EIS and therefore are not considered in the EIS.
- 5 As stated above, all of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99.
- 6 Both ORNL and LANL are FDA-certified "drug establishments."
- 7 Location and proximity to an airport would have an effect on the environmental impacts of the proposed project, especially with respect to transportation impacts. However, the environmental impacts of all the reasonable alternatives analyzed in the EIS were found to be low.
- 8 This comment correctly notes that truck transportation impacts for the ORNL alternative are expected to be lower than those for the SNL/NM or LANL alternatives.
- 9 The Department utilized the best data available and has attempted to provide comparable data wherever possible. In regards to the specific example, the EIS in Section 5.14 provides total spent nuclear fuel and hazardous waste volumes for each of the alternative sites (summarized in Table 5-19).
- 10 The costs for the modification of facilities and facility operations are presented in Table 5-1 and Table 5-52. Since each alternative proposes the use of existing facilities and the Department is already responsible for facility-related costs, such as facility decommissioning, an incremental cost analysis (rather than a life-cycle cost analysis) was considered appropriate information for the decision-making process for the proposed project.
- 11 The Chemistry and Metallurgy Research Facility at LANL is the preferred alternative for Mo-99 target fabrication, and the Annular Core Research Reactor/Hot Cell Facility (ACRR/HCF) combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.

- 12 The radiological air quality sections for the affected environment address uranium emissions in conjunction with other radionuclides released from the sites in recent years. Additional information specifying historical uranium releases would add little value to the EIS because such emissions are not expected to be a major environmental consequence of producing medical radioisotopes.
- 13 As discussed in Section 3.3.1, the ACRR could operate at 10% of U.S. demand after initially becoming operational. ACRR could potentially supply up to 30% of U.S. demand for a short period of time in this configuration in case of an emergency. The commentor is correct in stating that the ACRR would (under non-emergency conditions) only be able to produce about 10% of U.S. demand until all necessary modifications are complete.
- 14 This information has been added to Section 4 and Table 5-19 in Section 5.14.
- 15 It should be noted that the radiopharmaceutical companies, not DOE, would be required to obtain FDA approval for the Mo-99 produced by DOE. Each site would have the same requirement to provide a series of samples of the Mo-99 product to radiopharmaceutical companies so that these companies could obtain FDA approval of their products using the DOE-supplied Mo-99. The time required to obtain this approval is included in the estimated time requirements in Table 3-1. The FDA approval process could be initiated at different times for each of the alternatives because full power operation would not be required to begin the process.
- 16 The Office of Defense Programs has no current or foreseeable need for the ACRR. That Office has requested that, if the ACRR is selected for this mission, the capability of the reactor to perform defense experiments be retained in case of an emergency. The reason that the possible diversion of the ACRR for defense use is highlighted in the EIS is that, in an emergency, the ACRR is more likely than the other reactors considered in the EIS to be used for defense purposes. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.
- 17 The low-level waste piping would require an upgrade. This upgrade is included in the cost estimate for the reactor facility upgrades in Section 5.22.
- 18 The EIS presents the total site generation volume in Section 5.14 for all the alternatives.
- 19 The scheduling information listed in Table 3-2 is time from the Record of Decision. The ORNL alternative is in column 5. Similar information is provided for each alternative.
- 20 All facilities are Department of Energy facilities and would be decommissioned by DOE.
- 21 Please see response to comment C066-4 above.

**Oak Ridge Reservation
Local Oversight Committee**

February 8, 1996

Mr. Wade Carroll
MIPP-EIS Document Manager
19901 Germantown Road
Germantown, Maryland 20874

RE: Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes Draft
Environmental Impact Statement (DOE/EIS-0249D), December 1995)

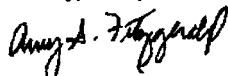
Dear Mr. Carroll:

The Oak Ridge Reservation Local Oversight Committee (LOC) is an independent, non-profit organization comprised of local elected officials and citizens from the City of Oak Ridge and six counties impacted by activities at the Oak Ridge Reservation.

After extensive review, the LOC submits the attached resolution as comment on the Draft EIS. The LOC disagrees with the DOE's proposed alternative, and considers the analysis incomplete in several areas.

The LOC appreciates the opportunity to provide input into DOE's medical isotopes project. Feel free to contact me at (423) 483-1333 if you have any questions.

Sincerely,



Amy S. Fitzgerald, Ph.D.
Executive Director

cc with attachment:

Earl Leming, Tennessee Department of Environment and Conservation, DOE
Oversight Division
Brian Kelly, Governor's Policy Office

Anderson • Meigs • Rhea • Roane • City of Oak Ridge • Knox • Loudon

136 S. Illinois Avenue, Suite 208 • Oak Ridge, Tennessee 37830 • Phone (615) 483-1333 • Fax (615) 482-6572

RESOLUTION**NUMBER 96-1**

WHEREAS, the Oak Ridge Reservation Local Oversight Committee (LOC), being comprised of elected officials and citizen representatives of Anderson, Knox, Loudon, Meigs, Rhea, and Roane Counties and the City of Oak Ridge, was created in part to provide local input into decisions affecting the continued operation of the U.S. Department of Energy's (DOE) Oak Ridge Reservation; and

WHEREAS, the U.S. medical community has been dependent entirely on a Canadian firm to supply Molybdenum-99, a radioactive isotope that has broad applications in the area of medical diagnostic procedures; and

WHEREAS, the U.S. Department of Energy (DOE) proposes to establish, as soon as practicable, a domestic capability to produce a continuous supply of molybdenum-99 and related medical isotopes for the U.S. medical community; and

WHEREAS, the DOE proposes to modify an existing research reactor and hot cells to produce and process Molybdenum-99 and related medical isotopes; and

WHEREAS, the DOE has prepared a Draft Environmental Impact Statement to evaluate facilities that have passed the preliminary technical screening criteria for Molybdenum-99 generation and processing; and

WHEREAS, the Oak Ridge Research Reactor/Radioisotope Development Laboratory at the Oak Ridge National Laboratory is one of four facilities under consideration by the DOE; and

WHEREAS, the DOE has selected the Annular Core Research Reactor at the Sandia National Laboratory as the preferred alternative; and

1 | **WHEREAS**, the DOE's analysis of the preferred alternative is the most expensive of the four capable of meeting the DOE's goals as stated; and

2 | **WHEREAS**, the Oak Ridge National Laboratory has had a long history of experience and expertise in the development of such isotopes; and

3 | **WHEREAS**, the DOE's analysis of the environmental consequences, schedule, and technology does not justify the selection of the preferred alternative; and

4 | **WHEREAS**, the Oak Ridge alternative is best suited on the basis of being designed to meet the necessary specifications, with all the needed production facilities in close proximity and a reactor designed to operate in a continuous mode; and

5 | **WHEREAS**, the citizens of LOC jurisdictions are entitled to assurances that the socioeconomic impacts and life-cycle costs associated with the DOE's alternatives are thoroughly analyzed; therefore, be it

6

RESOLVED, that this Committee supports the selection of the Oak Ridge Research Reactor as the preferred alternative for the production of Molybdenum-99 and related medical isotopes.

BE IT FURTHER RESOLVED, that this resolution shall be submitted to the U.S. Department of Energy for consideration in its preparation of the Medical Isotopes Production Project Environmental Impact Statement, and that the Executive Director send a copy of this resolution to the Tennessee Congressional delegation and other relevant federal and state officials.

This, the 1st day of February 1996.

Edmund A. Nephew

Edmund A. Nephew, Chairman
City of Oak Ridge

Amy S. Fitzgerald

Amy S. Fitzgerald, Ph.D.
Executive Director

Responses to Comment Letter C067

- 1 As discussed in Section 5.22, the estimated modifications costs of the preferred alternative are the second lowest, and the estimated annual operating cost of the preferred alternative is the highest.
- 2 As presented in Table 3-2, ORNL, LANL, and INEL all have significant isotope production experience.
- 3 The Chemistry and Metallurgy Research facility at LANL is the preferred alternative for Mo-99 target fabrication, and the Annular Core Research Reactor/Hot Cell Facility combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.
- 4 As discussed in Section 3.3, all of the alternatives will (after necessary modifications) have the capability to satisfy the purpose of the proposed action.
- 5 The socioeconomic impacts of the proposed project are discussed in Section 5.3 of the EIS. The costs for the modification of facilities and facility operations are presented in Table 5-1 and Table 5-22. An analysis of these costs and the projected revenues specific to this proposed project will be evaluated for each alternative as information for the Record of Decision process. Since each alternative proposes the use of existing facilities and the Department is already responsible for facility-related costs, such as facility decommissioning, an incremental cost analysis (rather than a life-cycle cost analysis) was considered appropriate information for the decision-making process for the proposed project.
- 6 Comment noted.



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February 8, 1996

Mr. Wade Carroll
MIPP-EIS Document Manager
U.S. Department of Energy
Office of Isotope Production and Distribution, NE-70
19901 Germantown Road
Germantown, Maryland 20874

Dear Mr. Carroll:

This letter constitutes the comments of Nordion International Inc. regarding the Draft Environmental Impact Statement (EIS), and we respectfully request that this document be made part of the public record. It is our sincere hope that you will view these comments as helpful, taking them into account as you assemble the final EIS.

Nordion's Plans to Secure Supply

Nordion is a private North American-based company owned by MDS Health Group Limited with operations in Canada, Asia and Europe. We have a 50 year history of reliably providing raw materials for radiopharmaceutical products to our customers for the enhancement of human life and health. In fact, there has never been a serious interruption of supply to our customers for any of our products in that entire time. While we do acknowledge that new reactors to produce molybdenum-99 must be completed to prepare for the next century, we do not expect this record of reliability to change. We have moved aggressively to ensure this will remain the case—securing back-up capability and making a major investment in building two new reactors and a processing facility.

Nordion has made several attempts to work with DOE to provide additional security of supply for the short term—prior to Mallinckrodt being in full production and prior to the Maple I start up. The United States Department of Energy (DOE) has remained focused on a long-term plan, which in our view does not meet the requirements of the Nuclear Medicine Community. In January 1995 representatives from the DOE, U.S. radiopharmaceutical producers, Nordion and research reactor operators from the United States and Canada, met in Albuquerque to generate an emergency response plan for molybdenum-99. In the ensuing report from the meeting, prepared by Bobby Savoie, the group concluded that the preferred option was a collaboration between the DOE and Nordion. Furthermore, the report concluded that a DOE program at Sandia for independent production would not meet the needs of the industry from a timing perspective. (report attached)

447 March Road, Kanata, Ontario, Canada K2K 1X8 Tel.: (613) 592-2790 Fax: (613) 592-6937

-2-

Nordion has very specific plans to address the security of supply for molybdenum-99. These plans have been widely communicated to the Nuclear Medicine Community in the United States, including informal communications with DOE representatives. There has been widespread endorsement of Nordion's plan as reflected in various communications printed in the Journal of Nuclear Medicine, Newline, November 1995 - January 1996 (attached).

1 Although Nordion has communicated its plans to the Nuclear Medicine Community, these plans are not accurately reflected in the Draft EIS. We therefore state for the official record that Nordion will provide the funding for two new reactors and a processing facility, all dedicated solely to isotope production. These facilities will be known, and are hereafter referenced, as Maple I and Maple II. The timing of the formal announcement with respect to this project has nothing to do with the commitment of funding, as implied in the Draft EIS Summary (page v). An issue related to the tax treatment of reactors in the private sector, which we expect to be resolved in the near future, is the only major item delaying the formal announcement. We anticipate construction of Nordion's new processing facility and the Maple I & II reactors will resume this spring.

Timing

2 The Draft EIS (page v) inaccurately describes the timing associated with Nordion's plan to develop a secure, continuing private-sector supply of molybdenum-99. The Maple I will yield product within 36 months, not 42 months as described. Maple II will be available one year later. Both of these reactors will be dedicated to isotope production. Each reactor alone will be able to meet the world's full requirement for molybdenum-99 for the next twenty years.

Nuclear Waste

The Draft EIS summary (page xii) states that the process to be used by the DOE would generate "primarily low-level radioactive waste." Based on Nordion's technical knowledge of the Cintichem process and information in the body of the Draft EIS, we believe this statement to be inconsistent with the facts.

3 While the Draft EIS understates the nature of the waste generated by the Cintichem process, it exaggerates the level of waste generated by the Nordion process. In its summary (page v) and in section 2.2 the Draft EIS makes reference to the Nordion process as generating substantially greater quantities of liquid waste. This is not consistent with later statements acknowledging that the process Nordion will employ in its new facility will generate comparable levels of waste to Cintichem process that the Draft EIS currently contemplates. Nordion urges that its strong commitment to reducing the levels of waste it generates should be clearly stated for the public record.

-3-

Private-Sector Sources of Supply

4 The Draft EIS (pages vi and viii) makes reference to the absence of private companies in molybdenum-99 production. In fact, Nordion is a private company in North America with a fully integrated production and distribution network. Our service and commitment to the U.S. Nuclear Medicine Community is unquestioned.

The Draft EIS assessment of back-up capability (page v) is severely understated. While it is developing the industry's long-term solution to a secure private-sector supply of molybdenum-99, Nordion has taken independent action to assure short-term back-up supply. Nordion has secured back-up capacity from the IRE reactor in Belgium and can guarantee a large portion of the required back-up. It is also anticipated that when Mallinckrodt completes development of its production capability in 1996/97 it will be able to supply the balance of what is required. In addition, molybdenum-99 from a South African reactor is in the process of being validated by U.S. radiopharmaceutical manufacturers. Together, Nordion, Mallinckrodt and South Africa offer a sound, back-up supply until the Maple I reactor is fully commissioned.

5 Even if one gives credence to the Draft EIS concern (page v) that overseas sources are not able to meet the U.S. demand fully, we cannot envision a scenario, under any circumstances, in which the DOE would be required to furnish 100 percent of the U.S. demand. Therefore, we believe it is unwarranted to assert that any U.S. reactor not capable of supplying 100 percent of the U.S. demand should be removed from consideration.

While Nordion agrees with the statements attributed to the DOE's consultants (page 2.3) Savoie and Singh, that "European capacity can only supply a portion of the U.S. demand," we have studied this issue and determined that European sources can be configured quickly to achieve sufficient back-up supply faster than the DOE would be able to establish a new, subsidized source of supply.

6 The idea that U.S. reactors capable of supplying only a portion of the U.S. demand should remain under consideration becomes increasingly meaningful in light of Nordion's repeated offers to the DOE to work collaboratively on a short-term back-up supply for North America. These offers include partial processing at a DOE facility prior to final processing and distribution by Nordion. Nordion's expertise and established distribution network, not addressed in the Draft EIS, remain available to the DOE should it wish to pursue a collaborative effort with the private sector. With this in mind, the University of Missouri, Missouri Research Reactor Center, discarded as an option (page xi, table S-1), could provide a solution which could be put in place more quickly than the preferred option being proposed.

-4-

Page vii of the Draft EIS sets a DOE target for specific activity of 10,000 curies/g which, based on Nordion's own customer needs, exceeds specific activity requirements. Therefore, eliminating the Missouri reactor from consideration based on specific activity (pages 3.59 and 3.60) is, in our view, not valid as the assumed needs of the customers are overstated.

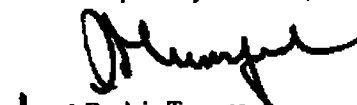
In addition to more quickly meeting the need for back-up capability, the Missouri reactor would be more cost-effective and could be activated only as required--also resulting in less costs. The "preferred option" as currently stated would require routine operation even when no product is required. Unless it is DOE's intention to market this product in direct competition with the private sector (in direct contradiction to DOE's stated objective), the current configuration for proposed back-up supply is wasteful and unnecessary.

Further, section 3.3.1.10 on page 3.28 describes a 28 month timetable for DOE production capability. By this time, the private sector options will be well-established and Nordion will be on the verge of having Maple 1 fully operational.

Options which allow the private sector to fully or partially participate in the short-term supply solution are in keeping with the DOE's stated mission of not competing with the private sector. In addition, these options directly address the concerns expressed by the North American Nuclear Medicine Community. The Society of Nuclear Medicine (SNM) and the American College of Nuclear Physicians (ACNP) have both urged the DOE to ensure that there was a reliable back-up source of molybdenum-99 as quickly as possible. These groups have never specifically asked for DOE to become that source. This view was recently made clear at the SNM Isotope Availability Committee meeting in Puerto Rico in January 1996 and further supported by statements in the January 1996 Journal of Nuclear Medicine Newslines (attached).

Thank you, in advance, for your consideration of Nordion's comments. Working together, we are confident that the DOE, Nordion and the Nuclear Medicine Community can move forward with a solution that quickly and cost-effectively achieves an increased short-term capability. Please let us know if you require additional information or assistance.

Respectfully submitted,


Dr. Iain Trevena
Vice-President
Isotope Products

/dh
Attachments



Date: January 20, 1995

To: All Mo-99 Emergency Response Workshop Participants

Subject: Initial Review Draft of the Emergency Response Plan

Enclosed as promised is the initial review draft of the Emergency Response Plan for Molybdenum-99 Production. The document has come together well, but still requires substantial refinement. It is, however, at a point where seeking your comments is both appropriate and valuable. Please review the enclosed documents and fax comments to me at (504) 834-5890 by the close of business on Tuesday, January 24, 1995.

As a side note, I met with Terry Lash, Director of Nuclear Energy at the Department of Energy on Thursday, January 19, 1995. It is clear that funding will be an extremely tough issue which will require further thought. We'll be working on that one and hopefully will have a better picture soon.

Please do not hesitate to call me as needed at (504) 834-5878.

Respectfully,

Bobby Savoie
President, CEO

111 VETERANS BLVD. / SUITE 900 / METAIRIE, LA 70005 / 504-834-5878 / FAX 504-834-5890

**EMERGENCY RESPONSE PLAN
FOR
MOLYBDENUM-99 PRODUCTION**

**INITIAL REVIEW DRAFT
JANUARY 20, 1994**

EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) is pursuing the development of a production source for Molybdenum-99 (Mo-99) at the Sandia National Laboratory (SNL). This action was precipitated by the current reliance on a single Canadian source, the NRU reactor at Chalk River, to meet the U.S. demand for Mo-99, which serves as the parent for the most commonly used medical isotope, Tc-99^m. The current SNL program would use the Annular Core Research Reactor (ACRR) with its adjacent hot cell facilities to provide a second supply source in approximately 18-24 months.

The U.S. nuclear medicine community and radiopharmaceutical manufacturers have expressed concern that the current DOE program, although valid, will not address the near term risk of an interruption in the supply of Mo-99. In response to these concerns the DOE held a workshop at SNL with the specific purpose of developing an emergency response option which could quickly be made operational. This workshop was broadly attended by representatives from industry, government, national laboratories, universities and Canada.

The workshop identified the parameters within which an emergency response option must function along with the criteria against which to evaluate options. Various options were identified and discussed. Several preferred options emerged for detailed evaluation, resulting in a single option, expedited production of "raw" Mo-99 at SNL for subsequent refinement by Nordion, being unanimously chosen for implementation if all assumptions hold. A detailed discussion of the objectives of this option was developed. An action plan was developed for the preliminary steps which must be taken to initiate this option.

The single biggest hurdle to implementing any emergency response option is funding. The Isotope Production and Distribution Program (IPDP) has very limited funds available during the current fiscal year. Furthermore, the overall atmosphere of budget reductions throughout the federal government and particularly to DOE may prohibit the redirection of funds from other programs. This issue, along with several others pertaining to throughput, sales and schedule must be resolved before a "go-no-go" decision can be made.

Emergency Response Plan for Molybdenum-99 Production

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1.0 INTRODUCTION AND PURPOSE

This document presents an emergency response plan for the development of a reliable, cost effective mechanism to keep Mo-99 flowing in the pipeline to patients if there is a supply interruption. It was developed under the direction of the DOE in concert with industry, universities, and national laboratories.

The most widely used isotope in nuclear medicine is Tc-99^m (approx 40,000 U.S. procedures per day). It is the daughter product of Mo-99. The short half lives of both of these isotopes precludes stockpiling of supplies. As such, a consistent stable, daily supply of Mo-99 is critical to the U.S. nuclear medicine programs. The Mo-99 Production and Distribution Chain is depicted in Figure 1.0.

Currently the largest supplier of Mo-99 on a worldwide basis is the NRU reactor in Canada. If this reactor were no longer available or the Mo-99 processing facilities were no longer available, a shortage of Tc-99 would be evident in two weeks.

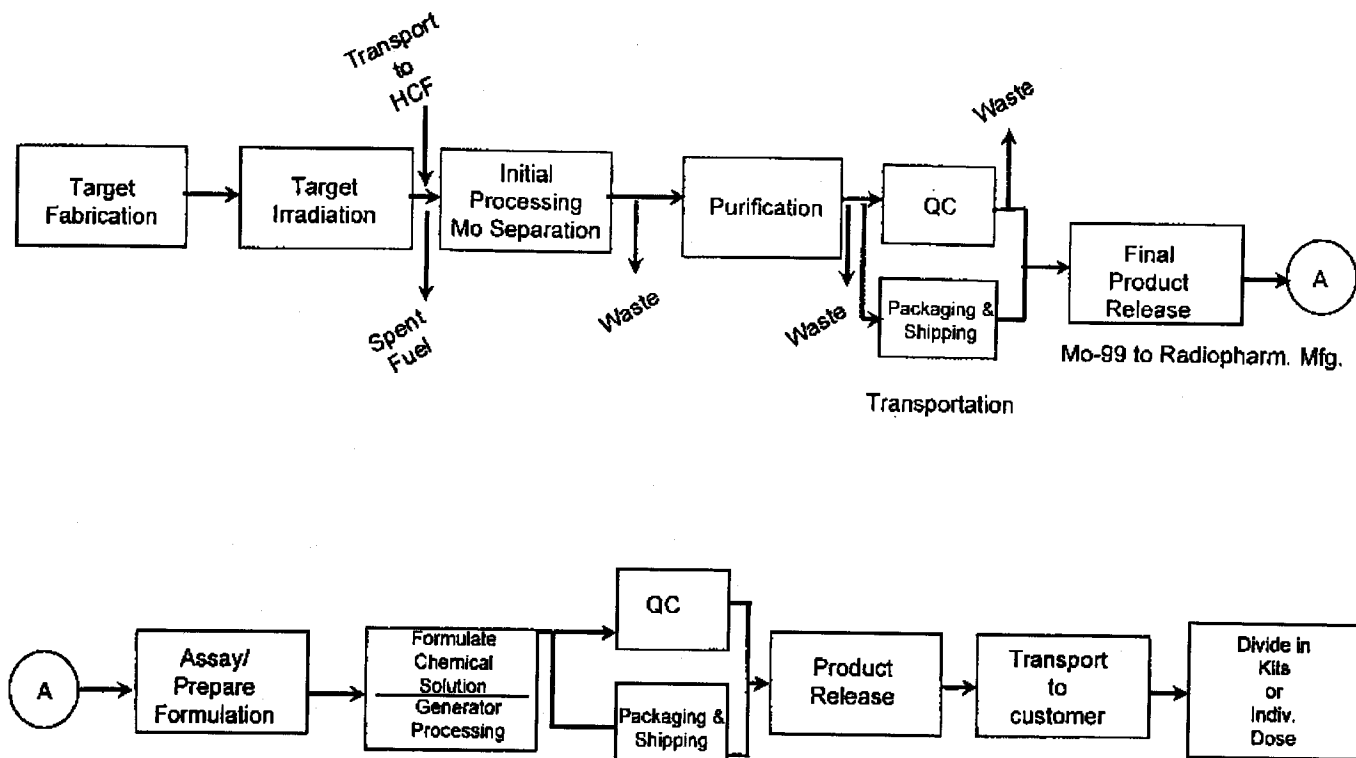
The other suppliers, primarily in Europe, could increase production for a limited time period only. Transportation distance and production capabilities in Europe would preclude meeting the North American supply for long periods.

A reliable backup capability in North America that could replace the current Canadian supply system during an interruption would better support the continued supply of Tc-99^m to North America than other identifiable solutions.

This plan begins by presenting the parameters of an emergency response option - those specifics which must be addressed in order for an option to be considered viable. This is followed by the parameters to be used in comparing/evaluating options. The various options offered at the workshop are then discussed in terms of their "terminal objectives" - the specific end points to be achieved for each specific option. Finally, an action plan is presented for achieving the chosen option - production of "raw" Mo-99 at SNL for shipment to Nordion in Canada.

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Figure 1.0
Mo-99 PRODUCTION & DISTRIBUTION CHAIN



2.0 PARAMETERS OF THE EMERGENCY RESPONSE PLAN

Any emergency response option must meet certain parameters if it is to fulfill its primary purpose of ensuring a reliable, cost effective mechanism to keep Mo-99 flowing in the pipeline to patients. This section delineates these specifics or parameters which the emergency response option must address. The plan must define the applicable requirements of each parameter and specify steps that are necessary to meet these requirements.

2.1 FDA Approval

The FDA approval process will involve amendments to the Drug Master applications filed by the radiopharmaceutical manufacturers and approved by FDA. This process will require that the Drug Master file (DMF) defines the Moly-99 production source and process; production site and procedures are approved, if required; and that the end customers (radiopharmaceutical manufacturers) have validated 3 production lots (trial runs of the emergency plan). If the final processing (refinement) step is accomplished by Nordion under its existing DMF this approval process may be greatly simplified.

2.2 Funding

The incremental funding required to create and implement an Emergency Preparedness Program is estimated to be an additional \$5 million in FY 1995. Some of these funds were planned for expenditure in FY 1996, but must be expedited to support the emergency response option. Obviously the program cannot be implemented unless the funding is available. It is critical that this funding include training personnel and developing support systems. The funding for this program is not currently available. Changing IPDP priorities, reprogramming DOE budgets or seeking other agencies support are the only possible government sources. These options must be evaluated and exercised immediately.

2.3 Quantity

The emergency response capability must be able to provide enough Mo-99 to support 100% of the North American requirements. This value is approximately 3000 6-day curies per week, or equivalent to 13,600 Ci per week at the pharmaceutical companies' docks. The amount of power required in targets to meet this demand is 400 kW. The reactor operation will be required for essentially 24 hrs/day, 7 days/week. If raw moly were shipped to Nordion, the production at the source must be increased accordingly.

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2.4 Quality

The process and product will need to be validated (qualified) to the level required by the Radiopharmaceutical Manufacturers. Concentration, purity and specific activity are included in the customer's product specification. A DMF must be written and submitted to the FDA so that customers may refer to it when applying to use the material. Good manufacturing practices must be followed throughout the process.

2.5 Time to Prepare Emergency Response Mechanism

The time required for the emergency response capability to be prepared for implementation must be as short as realistically possible since the supply is currently vulnerable. Implementation of the plan within six months of the issuance date is acceptable.

2.6 Cost for Preparing and Maintaining Plan

The cost required to prepare the emergency response plan and maintain it in a standby mode must be affordable, and the cost of the product, if the plan is initiated must be reasonable. Although this is a national priority issue, the cost must be within parameters which can be absorbed by the market or the U.S. taxpayer or a combination thereof.

2.7 Operational

Conduct of operation mentality appropriate to reliable continuous operation must be adopted by the facility and applied to all activities therein. Additional redundancy and reliability may be needed through equipment and procedural changes to ensure state of readiness. A complete compliment of trained staff and infrastructure necessary for all phases of operation in continuous 24hr/day operation must be maintained in readiness and be immediately available.

2.8 Time to Engage

In the event of an interruption in supply from existing sources, the plan should seek the initiation of Mo-99 production by alternate means within one calendar week, with final FDA - acceptable product being delivered to radiopharmaceutical manufacturers - within 2-3 weeks from the date when the interruption occurred. The entire North American demand should be met from week 3 onwards.

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2.9 Waste

The facility must have adequate waste management resources and must be capable of controlling gaseous emissions (I-131 & Xe-133 in particular), be able to either discharge liquid waste (including SLFP and possibly U-235) to a central waste handling facility on site or be able to solidify such waste for disposal with other solid radioactive wastes. It should be noted that the disposal of enriched U-235 must be considered carefully in order to prevent critically problem in the future and separation of U-235 may be necessary.

2.10 Other Regulations

Various regulations will effect the production and preparation of the product for shipment to the purifier and wholesale marketer. Specific regulations to consider include:

1. Target preparation - regulations concerning access to highly enriched uranium (Dept of State and NRC)
2. Reactor Operation - NRC or DOE approval of targets in reactor
3. Processing/Separation of Mo-99, handling of radioactive materials - NRC, DOE, or agreement state regulations
4. If transportation is involved between irradiation and processing - NRC, DOT plus International regulations, and State transportation regulations
5. Company, agency, organizational rules and regulations, within company facilities and controlled areas.
6. EPA and State regulations
7. For Government related operation - the NEPA process.

2.11 Staffing

The appropriate level of fully trained and available staff will be required for implementation of the plan. Staffing actions must consider documented training, overtime, and back-ups. Staffing plans should be driven by the short time required for implementation. Consideration should be given to temporary assistance from sources of existing expertise within the industry and appropriate agreements put in place.

2.12 Target Availability

The emergency response plan for Mo-99 requires a sufficient supply of targets to be available that are approved for irradiation in the selected reactor. The targets must be in a form that can be processed at an approved site. The inventory and product capability should be at least sufficient to supply the North American need for Mo-99 for 1 year. To the extent possible, the inventory should be at the reactor site. A fabricator for the backup targets must be available.

2.13 Target Processing

The relatively short half-life of the Mo-99 radioisotope (66 hrs) requires that the processing time (the time interval from removal of the targets from the reactor until the final product is delivered to the customer) be as short as possible. Under normal circumstances the target processing facilities have been at the reactor site or very close, in transport time, to the reactor.

The gross fission-product radioactivity contained in the uranium targets after irradiation for Mo-99 production is typically 25 times the Mo-99 radioactivity and must be shielded during the transfer of the targets to the processing facility. This gross radioactive inventory can amount to 10,000 to 100,000 Ci's per target depending upon the irradiation capabilities of the reactor.

The emergency response plan must provide a delivery system to enable the irradiation and processing of targets in the same time interval (1 to 3 days depending upon the option chosen) as is done in the routine normal production scheme. This maximum and minimum production time will depend on the starting Mo-99 inventory in the post irradiation target. The Mo-99 produced in the emergency response scheme must be equal in quality to the normal supply.

The target irradiation and Mo-99 separation process is technically complex and requires a highly trained staff of professional and technician level personnel in reactor operations, hot cell operation, radio-chemical processing, packaging, transportation and health physics. It would be extremely difficult, if not impossible to assemble a proficient team to accomplish an instant start-up. The available options for implementing the emergency plan should address this consideration.

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2.14 Transportation

One parameter required for a successful emergency Mo-99 response plan deals with transportation. Transportation will be required to take the Mo-99 product from the reactor to the process facility and then from the process facility to the customer. Due to the short half-life of the material it is necessary that all transportation time be minimized and scheduled commensurate with the anticipated target specific activity. The maximum and minimum transportation times will be determined by the curie content of targets. The capability to complete material transport must remain in place in order to support immediate startup of the process in an emergency.

By locating the process facility geographically close to the production reactor the first phase of transportation is simplified somewhat. Location of the process facility at the same site as the reactor could alleviate the need for using a certified licensed container for the movement. Locating the process facility close to the reactor could have the added benefit of minimizing transport time and the resultant decay of the product material. If the process facility is designed to produce a bulk Mo-99 product (i.e. not final form) transportation would be required, using certified container, to the final process facility (such as Nordion). If no processing capability exists near the reactor, transportation of thermally hot targets to a distant processing facility would be required. Pre-approved containers and plans to transport these "hot-targets" would be required.

The necessity of prompt delivery of Mo-99 to the customer requires that distribution logistics be addressed. The final process facility should be located such that it has ready access to air transportation (i.e. charter or military aircraft). These would have to be certified licensed containers and a sufficient number of these containers would be required to ensure that continuous "round-robin" deliveries could be completed. Additionally, the final processing facility must have the capability to complete rapid container decontamination to support shipment schedules.

2.15 Management

The management of the Mo-99 emergency response mechanism must be organized with a clear chain of responsibility and specific duties and authorities at every level. There must be a single individual with responsibility, accountability and authority to assure that the all parties and facilities are ready at all times to perform their function if the need arises. A single telephone call should be sufficient to implement the emergency plan.

The manager of each facility or operation involved in the emergency response plan must be fully responsible and accountable for the current and timely implementation of his/her part of the plan, and for the quality, quantity and cost of the product to be produced.

All functions and necessary actions of the plan must be documented and tested, and the documents must be available to every person who has a need to know.

The responsible manager(s) must periodically review developments in technologies and new discoveries in the associated fields to update information and documents used in the emergency response plan. All parties who might be affected must be notified of any changes on a timely basis, and training classes or exercises must be conducted where needed to implement changes.

2.16 General

Cooperative agreements between existing suppliers and the backup suppliers are paramount to a successful plan. DOE, Nordion and AECL have already held informal discussions on cooperative arrangements, and believe that within the context of providing backup support capabilities such agreements could be achieved without undue delay or difficulty. Agreements may also be required with national laboratories and customers.

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3.0 PARAMETERS FOR EVALUATING OPTIONS

In addition to the parameters of the emergency response plan discussed in the previous section, parameters were developed for evaluating/comparing options. These are obviously similar to those presented in section 2.0 but have a completely different purpose and are therefore distinct.

3.1 FDA Approval

Obtaining FDA approval requires understanding and implementing appropriate FDA guidelines. This includes establishing GMP (Good Manufacturing Procedures) procedures and facility operational specifications including final validations on site.

The steps involved in FDA approval will include one or more of the following:

1. Placing procedures and validation protocol in place and testing them, and getting data package ready for FDA approval
2. FDA review of data package
3. Complete and adequate response to all FDA questions
4. Customer validation of approved product

It should be noted that raw material may not require FDA involvement. The option must be evaluated to determine the extent of required FDA involvement and associated time for compliance with FDA requirements.

3.2 Management & Infrastructure

The DOE laboratories are not structured to facilitate the kind of production management required to implement a successful Mo-99 enterprise. Neither the experienced personnel nor the support systems are in place. This means that extensive training with substantial outside support should be undertaken immediately. The required culture change to go from a research-based to a customer-oriented production environment is a major undertaking. Without top management's strong support and appropriate resource allocation this program has little chance of success despite any technological accomplishments. The time and resources required to establish the required management and infrastructure must be compared for each option considered.

3.3 Cost and Economic Feasibility

All phases of cost must be considered for each option. These include startup, standby, operation (including target production and transportation), and post operation (including waste handling). Other considerations include capital, training, licensing, and overhead. The standby costs must be reasonable. The source of funding to cover these costs, whether government or customers, must be identified for each option.

3.4 Time to Get Ready and Time to Start Up in an Emergency

The amount of time required to implement, an option must be considered. There are two considerations, 1) the time required for the plan to be implemented, and 2) the time required for the plan to take effect when called upon. Six month may be on overly ambitious goal for a production backup to be established; one year or less may be more reasonable. When called upon to operate, ideally full production should be established within one week to ten days.

The minimum time to design, purchase, and install equipment in existing facilities; hire and train operators; obtain target supplies and be ready to produce and process Mo-99 is on the order of six months.

Administrative processes (NEPA, procurement, regulatory requirements of DOE, NRC, DOT, FDA) are additional time constraints that would extend the time to get ready. It is theoretically possible to obtain waivers of these administrative requirements such that additional time is not necessary.

Three major independent parallel activities are required. Preparation of a reactor, preparation of processing facilities, and preparation of a supply of targets. Each of the three major activities would require about six months of time for completion. Additionally, casks for transportation of irradiated materials, if required, would need to be made available.

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3.5 Transportation Feasibility

Transportation of the moly to the required destination must be feasible. Current approved shipping containers and methods of shipment must be considered as the most simplistic approach. New container certification requirements may be prohibitive. The containers must be currently certified, and enough must be available to meet the delivery requirements. The customer/supplier logistics must be considered. Delays and transportation times must be factored into the selection.

3.6 Complete Solution

The option must be complete. The option must fulfill the purpose of the emergency response. It must be a start to finish option dealing with all aspects of the problem, from raw materials, through waste management. The overall system must be optimized. The solution may require more flexibility in the supply chain. The solution must be able to produce raw and/or purified moly.

3.7 Public Support

The public and political support is essential for the funding and success of the program. Each option must be evaluated from this perspective to minimize public and political opposition.

3.8 Difficulty to Implement

The emergency response concept involves the almost instantaneous start up of a highly technical and complex operation to compensate for the unplanned interruption of the supply chain. The operations involved are normally closely regulated by government license or some other specific approval.

The emergency response plan should employ facilities or resources that are technically capable or allowable by license or permit to perform the necessary operations. The options must be evaluated in terms of establishing a capability which can be available in a "stand-by" condition of readiness.

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3.9 Waste Management

Waste parameters include disposition of liquid, solid, and high-level waste. The facility selected to complete Mo-99 processing must have the capability to safely handle and store liquid waste. Additional consideration should be given to subsequent solidification and long term storage of the waste products. Management of the waste products includes plans for routine, continuous handling of waste, waste minimization in the process, and plans for final waste disposition. The options must be evaluated on the capability to manage waste for the required length of time.

3.10 Product Quantity

Production quantity must be sufficient to meet U.S./North American needs in an emergency. Ideally it might be desirable to meet worldwide need to avoid allocations to/from European Sources. Any proposed plan must be evaluated as to its potential to meet these levels of production.

The test runs are required to confirm that adequate quantities will be available. If test runs indicate a shortfall, changes in irradiation/target/process will be made to correct the problem and re-testing will be performed.

3.11 Product Quality

The processing facility must have adequate analytical facilities and procedures to assure meeting the required product specifications prior to shipping. The specifications are well known and the analytical facilities must be able to detect the levels of impurities as noted in the product specifications.

3.12 Degree of Control

While the plan should include U.S. resources as much as possible, the use of AECL & Nordion resources for fluid processing and the use of European sources to help meet the shortfall should not be ignored. A clear definition of responsibility and ownership for the plan is required for effective initiation and management. This plan does not assure U.S. Independence in the market but shows a cooperative effort

Emergency Response Plan for Molybdenum-99 Production

between Canada and the U.S. is needed in order to avoid a shortfall of Mo-99. The critical point is that all aspects of implementation be within the control of those parties responsible for implementation.

3.13 Sustainable Production

Production of Mo-99 and delivery to the radiopharmaceutical companies must be sustainable for at least a two year period except for unpredictable factors such as strikes, "Acts of God," etc. It is preferred that there be no significant cost increase (e.g., greater than 10 %). The Emergency Response Plan must consider and evaluate potential disruptions in supplies of raw materials, transportation routes, equipment and/or facilities, and provide for alternate means of ensuring the supply if difficulties in any of these areas arise.

3.14 Reliability/Risk

The emergency supply pipeline for Mo-99 must use facilities and technology that can demonstrate the capability to perform their respective function reliably within the required response time and for the required time interval. This means that the needed staffing, infrastructure, management, and proper operational culture must be either in place or could be established.

3.15 Consistency with Long Term Solution

If the nature of the emergency is such be that viable commercial supply is interrupted for a long period, the emergency response mechanism shall be able to provide the basis for a long term supply option. However, the emergency response plan should not negatively impact the re-establishment of existing commercial supplier(s), nor impede the development of a new domestic supplier that may chose to pursue Mo-99 sales on a commercial basis.

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3.16 Consistency with Current Supply Chain

The emergency response plan preparation should not create changes in the current market system that would adversely affect any participant - producers, suppliers, distributors, users (patients). The plan, when and if it needs to be implemented should have as a goal, the ability to fill the production void fully and in a timely manner, with as little impact on the current participants as possible.

Organizations mobilized, as part of the emergency plan, must be willing participants, and need to be appropriately compensated. The emergency plan should integrate easily within the overall current supply chain. It is desirable, to the extent possible, that the commercial entities, currently involved in the supply chain, also be the implementers of the emergency response. The government should serve primarily as a helper, or facilitator, if necessary. It is inappropriate for the government to impose a system that causes any of the current participants to be a "loser". However, it is appropriate that all of the current participants take a role in effectively implementing an emergency response.

3.17 Impact on Existing Programs

Backup reactors or processing facility must be dedicated or prepared (and willing) to provide the production immediately following notification. Other program activities may piggy back during latent periods but must disengage without impeding Mo-99 production when required. Conduct of operation appropriate to Mo-99 production must be adopted by piggy back programs. Any programs, whose required disengagement, would delay initiation of production are precluded.

Backup process must be exercised periodically or continuously at low level (which may reduce time available to other programs), so as to periodically validate emergency readiness.

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3.18 Categories of Evaluation Criteria

Although each of the parameters for evaluation options discussed previously must be considered, they are not all of equal importance. The parameters (now evaluation criteria) for the options were divided into four categories as listed below:

Go-No-Go

1. The option must offer a complete solution
2. The option must be able to produce the required quality of the product
3. The option must adequately address the management of the waste generated
4. The transportation required to implement the option must be currently feasible

Very Important

5. The quantity of Moly-99 produced
6. The time to start up in an emergency
7. Time to get ready to implement the option
8. Reliability/Risk (This includes ability to sustain production)
9. Consistency with current supply chain (including FDA status)

Important

10. Public and political support
11. Cost and economic feasibility
12. Difficulty to implement
13. Management and infrastructure

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Not Very Important

- 14. Consistent with long term solution
- 15. Impact on existing programs

Based on the Go-No-Go Criteria certain options were dismissed. Based on other criteria, the team agreed on the preferred options discussed later in the report.

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4.0 EMERGENCY RESPONSE OPTIONS

This section provides a brief description of the ten options discussed in the workshop and evaluation criteria for the options.

4.1 ACRR Raw Moly

This option requires the irradiation of targets in the ACRR. The targets could be either Cintichem targets commercially produced by Babcock and Wilcox or by LANL, or AECL targets shipped from Canada. The first stage processing of the targets would be performed in the Gamma Irradiation Facility (GIF) located next to ACRR in the same building or in the Hot Cell Facility (HCF) located in a building adjacent to but outside the ACRR building. The crude Mo-99 obtained from first stage processing would be shipped to Nordion for final purification, QC verification, and distribution to radiopharmaceutical companies.

Major issues discussed relative to this option included modifications required to the ACRR facilities and training of personnel. Although these requirements will essentially be the same as that for the current SNL Mo-99 program, this option will not require the establishment of a QC laboratory. There will be additional funds (\$5 to \$6 million) required for this option which are not currently available. There will be additional regulatory issues that will have to be dealt with. It was stated that this option will take approximately six months to implement.

4.2 AECL Targets to U.S. Reactors

This option requires that AECL targets be irradiated in a U.S. reactor such as University of Missouri, McMaster, ATR, or ACRR and irradiated targets be sent to AECL for processing. As an alternate the irradiated targets could be processed at INEL or LANL. In either case, Nordion would receive the same crude moly-99 as they currently receive from AECL and would perform the same steps as they currently perform, i.e., final purification, QC verification, and distribution to radiopharmaceutical companies.

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The major issues discussed relative to this option were the required evaluation of U.S. reactors to irradiate AECL targets to the extent required for the emergency, the apparent lack of adequate shipping casks to accomplish the task, and the time required for shipment.

4.3 MURR

This option requires that spent fuel from the MURR reactor at University of Missouri be shipped to AECL. AECL would process the fuel to extract crude moly-99 which would be sent to Nordion for final purification and distribution.

The major issues involved evaluation of processing capability and willingness on the part of AECL (who was not represented at the meeting), the modifications required at AECL, and the extent of FDA involvement due to a revised process. It was stated that this option will take approximately 1 year to implement not counting the time required to obtain FDA approval.

4.4 Expedite Current SNL Mo-99 Program

This option requires that the current program at the SNL be expedited by using targets from B&W and by obtaining certain exemptions to the NEPA process. It was estimated that this would require additional funds and will take approximately 13 months to implement.

4.5 Multiple U.S. Reactors

This option required fabrication of the Cintichem targets by B&W, irradiation in more than one U.S. reactors including DOE and University reactors and transport of the irradiated targets to AECL for raw processing and finally shipment of raw moly-99 from AECL to Nordion for purification and distribution. The issues involved with this option are similar to those associated with the option described in 4.2 above.

4.6 SNL-LANL

This option required the targets (Cintichem) to be fabricated at LANL, irradiated at ACRR and shipped back to LANL for processing in their CMR facility. The processing at LANL could be the first stage processing to produce raw moly-99 which could be shipped to Nordion for purification and distribution; or LANL could perform the entire processing, including purification and QC verification and shipment to radiopharmaceutical companies.

It was stated that this option would take at least one year to implement and would require approximately 1.3 million dollars.

4.7 Commercial U.S. Reactors

This option required the irradiation of Cintichem targets in a commercial reactor and transport of irradiated targets to either AECL or SNL for processing to obtain raw moly-99 which could be shipped to Nordion. The commercial reactors would be compensated for the loss of power generated.

Major issues associated with this option are the required modifications to commercial reactors, the apparent lack of adequate shipping casks to accomplish the task, the time required for shipment, and potentially huge costs associated with loss of power generated.

4.8 ATR

This option required irradiation of Cintichem targets (fabricated by B&W) in ATR, processing of the irradiated targets at INEL to produce raw moly-99, and shipment of this product to Nordion for final purification and distribution. Although, ATR has previously irradiated Cintichem targets, the major impediment to this option was identified as the operating cycle of ATR and its inability to transfer targets during operation.

4.9 B&W Aqueous Reactor

This option required using the B&W aqueous reactor previously used at LANL (SUPO) in a hot cell at the CMR to produce raw moly-99 which could be shipped to Nordion for final purification and distribution.

4.10 McMaster Reactor

This option is similar to the MURR option described in 4.3 above except that the McMaster reactor will be used in lieu of the University of Missouri reactor.

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5.0 DISCUSSION OF PREFERRED OPTION(S)

The previous section described each potential option for providing a Mo-99 emergency response mechanism. Figure 5.1 depicts each option in a blank matrix format versus the evaluation criteria presented previously in section 3.0. Each option was evaluated against the evaluation criteria by all workshop participants. The first step was to eliminate those options which did not meet the "go-no-go" criteria. The participants agreed that the options of "Irradiating AECL targets in U.S. Reactors" and "Using Commercial U.S. Reactors" could be eliminated. This left eight (8) options to be ranked/evaluated against the evaluation criteria. The results of this exercise are depicted in Figure 5.2.

Based on the rankings shown in Figure 5.2 four primary options were chosen for further evaluation as follows:

- Option 1 - ACRR produce raw Mo-99 for processing by Nordion
- Option 2 - ACRR/LANL/Nordion cooperative venture
- Option 3 - Expedite the current SNL ACRR Program
- Option 4 - Ship MURR fuel rods to AECL/Nordion

Further analysis showed that the time required to prepare Option 3 was unacceptable and provided little advantage over the current program. Therefore, Option 3 was eliminated from consideration. This left 3 primary options for consideration. These options were analyzed in terms of "terminal objectives" - the "end state" that option must achieve to be prepared to serve as an emergency response mechanism. Many of the terminal objectives are common between the options and interrelated. Besides defining the end-point for each option, the terminal objectives drive the action plan for implementing a particular option. The remainder of this section further describes each of the three preferred options in terms of terminal objectives and time to prepare for implementation.

Figure 2.1
Evaluation Issues Matrix

Criteria	Public Private Support	Cost & Economic Feasibility	Time to Get Through	Time to Start Up in an Emergency	Whole Enterprise Management	Transportation Feasibility	Consistency with LAQ and State	Public Use Improvement	Complete System?	Impact on Existing Programs	Logistics of Control	Feasibility of Data	Feasibility of Quality	Product Quality	Modularity & Interchangeability	Consistency with State Goals
ACIR BAYVIEW																
ACIR Targets in U.S. Markets																
MURR																
Ensemble Current SR Program																
Multiple U.S. Program																
SHI-JAH																
Commercial U.S. Program																
AIR																
Many Agencies Responsible																
Reflector																

Figure 5.2
Vote Count and Rank of Options

Rank	1	2	3	4	5	6	7	8
Options								
ACR/NHAWMO	8	5	2	1	1	0	0	0
MURR	4	0	3	3	3	2	2	1
Expedite Current SNL Prog.	2	9	3	0	1	2	1	0
Multiple U.S. Reactors	0	1	0	3	2	2	2	4
SN-LANL	3	2	7	8	1	0	0	0
ATR	0	0	2	3	4	3	4	1
Baby Assisted Reactor	0	0	0	2	0	5	3	8
Schneider	1	2	1	2	5	3	2	2

5.1 Option 1 - ACRR Produce Raw Mo-99 for shipment to Nordion

5.1.1 Targets Available and Qualified for Processing Irradiation

Having targets available and qualified for processing in the ACRR requires the following steps:

1. Target Specifications and Test criteria to be mutually agreed to among B&W, Sandia and DOE.
2. Purchase agreement between B&W & SNL - Detailed purchase order can follow
3. B&W procure any equipment and raw material (fittings, stainless tubing) not in inventory and install process equipment
4. Manufacturing process flow chart established
5. Shipping arrangements - Uranium to Lynchburg/Targets to Albuquerque
6. Pilot run (~ 5 Targets) completed, tested and shipped
7. SNL Acceptance Test & Irradiation Tests
8. Process Modification, if required
9. Start Production at 40 Targets/Week
10. Ship 40 T/Wk

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5.1.2 Sufficient Staff Hired, Trained, & Qualified

The production of Mo-99 requires a very diverse staff, some of whom (radiological protection personnel, security, etc.) will be furnished by the facility independent of the type of work that is to be accomplished. The additional personnel, however, are mission specific and include the following:

1. Hot Cell Technicians trained in the use of manipulators, iodine control, good manufacturing practices, process procedures, decontamination techniques, radiation worker training, and waste handling
2. Reactor Operators trained to operate the ACRR and certified by testing
3. Maintenance personnel trained in the specifics of the facility, in particular the repair of manipulators, replacement of filters (both HEPA and charcoal) and the repair/maintenance of shipping casks
4. Supervision for the operating/maintenance crews
5. Quality Assurance personnel trained to the product specification and available for specific problem situations as they arise
6. Analytical Chemistry personnel, trained and equipped to assay product and process stream to the levels noted in the product specification
7. Facility manager trained to the Tech Specs of the Reactor and to the Operational Safety Requirements of the non-reactor nuclear facilities
8. Shipping and Transportation personnel trained to DOT regulations
9. Customer Services personnel trained to handle customer orders, complaints, problems, and billing

Emergency Response Plan for Molybdenum-99 Production

The staff must be of sufficient size to provide around - the - clock operation, both at the reactor and the processing facility.

5.1.3 ACRR Mods Complete/Uninterrupted Steady State Ops

Reactor Core Reconfiguration

The core must be reconfigured to accept and irradiate targets. The main modifications that must be made are simple and straight forward, requiring only the current staff to accomplish. These activities include removing the cavity liner and offser tubes, adding an attachment grid structure in the central core region to accept 19 to 37 targets, and reconfiguring the bridge. The time required to accomplish these tasks is estimated to be 3 months.

Heat Exchanger Upgrade

With the current 2 MW pool cooling capability, about 70% of the required demand could be met. In order to meet the full 100% demand, ~400 kW of target power is required. To meet this the reactor would have to operate at ~3 MW. The current heat exchanger upgrade design includes dual redundant 4 MW heat exchangers, pumps, and cooling towers. The upgrade of this system is estimated to cost ~1 M. The time required to install would be on the order of 4 months. This would require a parallel path with the EA.

Control Systems/Console

The current control console is located within 30 ft from the top of the reactor tank. Although this could be used for moly production, it is expected that the radiation levels would be too high for continuous 24 hr/day operations. The control console upgrade has been ongoing intermittently for several years. Currently there is a dedicated team working to have the complete system operational by May 1995. The control rod drive motors are also being upgraded.

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Ventilation System

At this point in time it is unclear as to what upgrades would have to be performed on the ventilation system. The current system may be adequate or minor modifications may be required.

Analysis for Operations and Safety Evaluation

Much of the calculative work has been performed for both operations and safety evaluation. This work could be finalized within 2 months.

SAR and TSR Change/USQ Addressed

There is a current SAR and TSR documentation. Changing over to moly will require a high degree of responsiveness from the DOE. This is the most uncertain area for achieving the desired goal. The review and approval path must be set up in advance and as much authority at the local level must be given as possible.

Prototype Testing

Targets must be tested after the modification and approval process to determine if the desired power levels of 21 kW per target can be achieved. ~400 kW is required for all targets.

5.1.4 Transportation Issues Resolved/Casks Available

A Transportation Plan must be delivered and subsequently implemented that addresses all of the issues appropriate to providing Nordion the raw Mo-99 product they require in a timely fashion. Shipping and Waste Packages must be certified for use and their licensing must be addressed so that they remain current. The product packages, namely CI-20 WC-2 and - 2A must be approved for shipment to Canada by US authorities and subsequently the Canadian Government must review and approve these packages for use in their country.

Emergency Response Plan for Molybdenum-99 Production

A handling and transportation staff must be identified, funded, trained and qualified to package, handle, and transport Mo-99 between production facilities and air charter or freight loading ramps. Air freight and/or charter air companies must be contracted to transport Mo-99 packages from Albuquerque International Airport to Ottawa Canada. The Production Plan will call for daily shipments and a combination of air freight and charter air may be necessary. Regulatory issues concerning all aspects of packaging, and ground and air shipments must be identified and complied with or appropriate waivers or exemptions must be acquired.

Coordination and agreements between SNL and Nordion must be accomplished to identify the required shipment schedule. The point of product acceptance in Canada (Ottawa ARPT), and the establishment of radio product package turnaround procedures.

Transportation also includes waste shipment to disposal sites or site. Similar to above personnel, packages, and appropriate licensing must be accomplished to support this function. In addition however, waste disposal agreements must be in-place or available to support this emergency production plan.

5.1.5 Hot Cell Facility/GIF Operational

There are several key tasks which must be accomplished to make the Hot Cell Facility or GIF Operational. These include the following:

Hot Cell Modifications

1. Deionizer in GIF Storage Pool
2. Isolate dissolve cell from reactor pool
3. Install pass-through between cells
4. Install adequate ventilation and air filtering equipment (HEPA - Carbon - HEPA) with sufficient decontamination factor
5. Provide product unloading (cask-loading) facilities in GIF
6. Provide fission product waste storage/unloading (cask loading) facilities
7. Provide manipulator handling, maintenance and repair facility

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Processing Equipment

1. - Target dissolver equipment
 - Heater/Rotator spindle
 - Target reentry fittings
 - Vacuum pump
 - Cold Trap
2. - Mo-99 Separation Equipment
 - Raw fission liquor bottle
 - Raw fission waste bottle
 - Precipitate filters
 - Ag/C column
 - Raw Mo 99 product bottle
 - Glassware holding equipment and liquid product transfer fittings, miscellaneous items (syringes, valves, needles, etc.)
3. - Waste packaging/storage equipment

Raw Material Inventory

1. - Target storage facilities (security & criticality)
2. - Warehouse & inventory control system
3. - Process equipment make-up lab

Documentation

1. - Revise SAR for Max credible accident
2. - Process procedures
 - Target handling
 - Dissolution & precipitation of Mo-99

Emergency Response Plan for Molybdenum-99 Production

Ag/C Purification of Mo-99
Fission waste processing/solidification
Mo-99 product packaging and shipping
Fission product waste packaging & shipping

3. - Operational Procedures

Hot Cell Maintenance
Manipulator Maintenance
Contamination Control
Ventilation Maintenance
etc.

5.1.6 FDA Approval

There are several key issues concerning FDA approval of this option which must be addressed:

1. Nordion needs to modify their DMF to include Cintichem type Uranium-Oxide targets, irradiated at any reactor as a source of first stage raw Mo-99 and processed to remove the waste material. To do this they need to obtain the product specifications as developed by SNL and sample material to test and run through their final chemical process to show that the final product is equivalent to their current product.
2. Generator manufacturers will need a sample of the SNL irradiated, Nordion processed Mo-99 solution to determine that the Mo-99 does not negatively effect the performance of the generator: Manufacturers may need to add a statement on their annual report to FDA that they have qualified this supply of material. They also need to amend their drug master applications.

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5.1.7 NEPA Issues Resolved/Exemptions

All NEPA issues must be resolved prior to start of Mo-99 production. The current EA (in the review and comment phase) must be amended to include processing in the GIF. Process effluent from any portion of HCF is already included. Process effluent from the GIF stack must be included as well as continuous operation within the high bay area. The EA must also be amended to include shipment of "Raw" Moly to Nordion and transfer of waste from GIF cells to HCF storage and handling area.

5.1.8 Repair and Maintenance Prog

There are several key factors to be addressed in developing a maintenance program for the reactor, Hot Cells, equipment, container, and associated facilities.

1. Adequate maintenance personnel available.
2. Maintenance program in process cell in accordance with GMP.
3. Adequate backup equipment.
 - Shielding window maintenance in place and personnel trained
 - Support systems, hydraulics, ventilation, HVAC, Radiological instrumentation etc., maintenance in place and operational

5.1.9 Nordion Ready to Accept/Process Crude Mo-99

Within the six months implementation window, Nordion must undertake activities required in order to accept and purify the crude Mo-99 stock provided by the first stage DOE process. These activities include:

- Definition of incoming product specifications
- Definition and Implementation of Incoming Product QC
- Facility Modifications as may be required to handle the designated shipping container

Emergency Response Plan for Molybdenum-99 Production

The end result is such that Nordion is able to perform validation run(s) at production levels as will be required in support of a change to its existing DMF with the FDA.

5.1.10 Operational Readiness Assessment

DOE orders require an extensive readiness review process to be completed prior to the initiation of a major change in a facility operation. In the case of Mo-99 production this would encompass operation of both the reactor and the hot cells. Furthermore the DOE order is based on a large reactor and the scope would imply evaluations of activities that are not significant to a small research reactor's operation. The SNL must be prepared to undertake the appropriate and necessary level of readiness assessment.

The obstacle to overcome is to establish a "waiver" condition where by the readiness assessment is scoped to the ACRR (not a 500 MW production reactor) and the duplication is reduced. A suggested assessment might include:

- a) form the SNL & DOE review teams
- b) Have the DOE team review the SNL scope to assure it is sufficient
- c) Have DOE team "observe" the conduct of the SNL review
- d) Have DOE team identify any specific areas that warrant a separate DOE review
- e) DOE team looks at any corrective actions that SNL is performing as a result of the SNL ORR.
- f) If satisfied that the SNL review has been sufficient and completed, and that the corrective actions have been taken; the DOE ORR process is completed.

5.1.11 Quality Control Lab Established

A Quality Control lab (facilities & resources) must be established to verify and release bulk Mo-99 for shipment. It must also have the capability to test and accept the raw materials required to complete the first stage process. The analytical services must be able to measure the quantity and quality of the 1st stage product as well as test chemicals and materials to USP specifications (or equivalent). In order to satisfy the requirements of Good Manufacturing Practices, a Quality Program and Quality

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Plan for Mo-99 production will need to be established which demonstrates satisfactory levels of control & documentation within operations and QC.

All operational procedures and test methods must be validated prior to delivering useable product to NII and ultimately to the industry. Nordion will have qualified (validated) SNL's first stage Mo-99 prior to this time as well.

5.1.12 Competing Missions Eliminated/Resolved

Once the required schedule is established, negotiations with competing programs must be conducted to eliminate, reschedule or accommodate any activity which impacts the emergency plan terminal objective.

5.1.13 Radiological Monitoring Equip Operational

A key aspect of establishing a Mo-99 operation is proper radiological monitoring. This includes:

- Hot cell processing will have a proven confinement.
- Confinement adapted to remote operations.
- Testable charcoal and HEPA Systems.
- Operating, trained team of Radiological personnel.
- Full coverage of Facility Monitoring equipment for Iodine, particulates and Noble Gases.

5.1.14 Waste Issues Resolved

Provision must be made to transfer process waste from the GIF cells to a transfer container for subsequent movement to HCF Waste Storage and Handling Area.

Emergency Response Plan for Molybdenum-99 Production

5.1.15 Industry Agreements in Place

The Emergency Response Plan requires that two distinct agreements being in place:

- (a) An agreement between DOE and Nordion covering - management of the supply chain; product specifications; transfer pricing; confidentiality; Nordion concerns about assisting in the development of a competitor
- (b) An agreement between the radiopharmaceutical industry and Mo-99 produces covering - Means of allocating product under Emergency Shortage of Supply During Transition Periods; Confidentiality; Emergency Supply situation; Management/Communication; Responsibility & accountability for each step of an emergency process; pricing considerations

5.1.16 Fuel Inventory Available

The available fuel inventory must support six months of steady state full power operation. Fuel fabrication must be available to start supplying additional fuel within four months of modification to start production.

5.1.17 Procedures & Documentation (SAR) complete

All required procedures, at the program level and as required by each facility to be used in the Moly-99 Emergency Response Plan are to be identified and preparations included in the preparations to effect the plan. These shall include, but not be limited to:

- Modifications to the facility Safety Analysis Reports
- Environmental Assessment(s)
- Staff Trained Plans and Procedures
- Waste Management Plan(s) and Procedures(s)
- Quality Control Plan(s) and Procedures; e.g. process control specifications, test procedures, standard operating procedures, etc.
- Change Control Procedures(s)

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5.1.18 Management Prepared

Central responsibility of the Moly-99 Emergency Response Plan (ERP) will reside in the Department of Energy (DOE), Office of Nuclear Energy (NE), Isotope Production and Distribution Program (IPDP). A single individual will be identified, who will have the authority to make binding decisions for the ERP within the governing regulations and policies of the DOE, EPA, FDA, etc.

With the approval of the IPDP ERP manager, each participating organization will also identify a single responsible manager to direct and manage the work on the ERP by his/her organization in cooperation with the IPDP ERP manager. An organization chart will be published and distributed, along with a brief description of the duties, responsibilities and authorities of each manager and how they are to interface with each other.

The group of managers shall identify all required documents, plans, procedures, etc. necessary to prepare for and to implement the ERP when and if necessary. Preparation of the documents will be done by the organization most directly affected by each one, subject to review and comment by the other, interfacing organizations, and approval by the IPDP ERP manager.

Under the guidance of the DOE IPDP manager, appropriate readiness reviews shall be conducted to confirm that the various parts of the plan and the associated organizations are properly prepared to perform their respective functions.

The ERP manager shall conduct meetings of the manager group as required to assess and control progress on the preparations, and once the plan is in place, additional meetings as required to ensure that readiness is maintained and changes or new developments are accommodated in the ERP.

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5.1.19 DOE Funding

Funding for the Mo-99 emergency plan, because of the timing, must come out of already allocated funds most likely within the DOE IPDP. While this will likely affect other isotope initiatives, there may be a opportunity to seek a higher funding level for the FY '96 IPDP budget.

In order to shift the estimated \$5 million needed for the Mo-99 emergency plan from other budget accounts the office of the secretary and the Director of Nuclear Energy must be convinced that it's the right thing to do. This pressure must emphasize the importance of putting an emergency plan in place and the fact that there is consensus within the nuclear community (including industry) and within parts of DOE for the need for an emergency Mo-99 plan.

There are also additional concerns that must be addressed. The first is convincing OMB of the need for Mo-99 program. This will realistically entail stopping OMB from making specific cuts in the Mo-99 program.

The likelihood of success in securing funding within DOE, while not easy is helped by the fact that industry has already begun to bring this issue to the attention of the Secretary's office, and OMB and Congress.

There is still a need to educate some Members of Congress and their staffs on the importance of Mo-99. Nevertheless, support for funding an emergency response plan for Mo-99 will have to overcome the inherent discomfort Congress may have with DOE and the frenzied budget cutting atmosphere.

5.1.20 Production Quantity and Schedule Established

The Sandia hot cell operation needs to be able to respond, in emergency, to a nominal 5 fold increase in normal output. This could be accomplished by:

- a) a transition from single shift/5 day week to around the clock operation; one crew to 3 or 4 crews. Crew readiness needs to be maintained; or
- b) major automation of the hot cell process, permitting automatic systems to ramp

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up and increase the output with little increase in manpower.

Option (a) requires higher continued operational costs. Option (b) requires higher initial cost (capital investment).

5.2 Option 2 - ACRR Irradiate targets - LANL Raw Mo-99 - LANL or Nordion Refinement (8 mos.)

This option entails all those terminal objectives applicable to Option 1 plus those described herein.

5.2.1 Target Transportation to LANL

Target transport to Los Alamos in lots of 1 to 8 targets is potentially available. Two B3 casks have arrived in Los Alamos and are in the beginning stages of inspections by LANL transportation. A fully compliant package will be available within the designated time frame (6 mo). A dedicated trailer will have to be purchased for expeditious shipping.

A inner package will have to be built that may require additional shielding. However the Certificate of Compliance (C of C) for the B-3 allows 9000# of internal shielding.

Transporting of up to 8 irradiated targets per shipment is allowed when the wattage/cask is 400 watts. Calculations show that 6 hours after removal from the reactor, the targets are less than 100 watts each. They could be received well within the 10-12 hour window that was originally planned for LANL processing.

5.2.2 Public Opposition Resolved

Public opposition is not a trivial issue, but can potentially be resolved by a functioning stakeholder office in Los Alamos. Opposition to shipping of Isotopes was minimal in previous public meetings. However, an effective outreach effort is required to keep this from becoming an issue.

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5.2.3 Waste Transportation to SNL from LANL

LANL has existing waste facilities that respond to ongoing funded processes. If necessary, the waste will not have to leave Los Alamos. It was suggested that the pipeline for this profile of waste (that SNL will have to establish anyway) be used to eliminate redundant efforts. In the scaled-down mode proposed at Los Alamos to handle emergencies, there is available allowed storage capability of 24 weeks of 3000 ci/wk production.

5.2.4 Completion of CMR upgrades

The upgrades to the Hot Cells within the CMR have been completed in the area designated for Mo-99 production. Radiological equipment and wiring to master control monitors is going on at this time with completion scheduled in the spring.

5.3 Option 3 - Expedite Current SNL Mo-99 Prog. (13 - 15 mos.)

Although this option was originally ranked as a preferred option, the time to implement (13-15 months) was deemed unacceptably long. Therefore, terminal objectives were not developed for this option.

5.4 Option 4 - Ship MURR Spent Fuel Element to AECL/Nordion (12 mos)

The specific terminal objectives necessary to accomplish this option are discussed herein.

5.4.1 Operational Readiness Review

When all other objectives are completed, sufficient number of test runs should be completed to prove operational readiness.

Emergency Response Plan for Molybdenum-99 Production

5.4.2 Waste Issue Resolved

AECL needs to be prepared to handle the larger volume of process waste generated per curie of Mo-99 when processing a MURR fuel element.

5.4.3 Industry Agreements in Place

AECL must agree to accept and process MURR fuel elements

- Nordion must agree to accept and qualify the raw Mo-99 from the process
- B&W must agree to fabricate the additional fuel elements on an emergency demand schedule
- DOE must agree to additional fuel support in case of an emergency
- MURR must commit to weekly shipments of one week fuel element.

5.4.4 Fuel Inventory Available

The available fuel inventory must support six months of steady state full power operation. Fuel fabrication must be available to start supplying additional fuel within four months of notification to start production.

5.4.5 Commitment for Additional Funds by DOE

DOE needs to agree to provide for the additional fuel fabrication cost necessary to support the Emergency Mo-99 plan. Funds may be required to cover modifications at AECL and to support increased waste generation if and when emergency plan is implemented.

DOE needs to fund feasibility review for this option.

Transportation costs need to be covered.

Emergency Response Plan for Molybdenum-99 Production

5.4.6 Production Quality & Schedule

Preliminary indications are that a single MURR fuel element run for 1 week and shipped on a weekly basis should meet the specifications required by Nordion, when processed in a similar manner to the NRU targets currently use. This will have to be validated by test runs.

5.4.7 AECL Prepared to Use MURR Fuel Element

AECL must determine what modifications are required to process a MURR fuel element and complete the modifications.

5.4.8 Transportation Issues

Approval must be in place for using an available cask for transporting a MURR fuel element with sufficient Mo-99 inventory from Columbia, Mo to Chalk River, Canada. This requires approval from the NRC for the use of the Cask and route in the U.S. and appropriate approvals for route and cask in Canada. Agreement must be in place to make cask immediately available if Emergency Mo-99 Plan is implemented.

5.4.9 FDA Approval

Raw Mo-99 from processed MURR fuel element must meet specifications set by Nordion to allow amendment of DMF.

5.4.10 Sufficient Staff hired, trained & qualified

Already in place.

5.4.11 Public Opposition (to transportation) Issue

Weekly shipments of a fresh fuel element through four states, across the border and through the province of Ontario will require appropriate understandings in advance

Emergency Response Plan for Molybdenum-99 Production

with each of the states, and an agreement with the provincial government as well as the Canadian federal government. Public opposition can be mitigated by making two aspects clear in public perception:

- a) A single short-decay fuel element has no more activity than the eight long-decay elements that have routinely been shipped across five states, and the fresh fuel decays at a faster rate than the old fuel.
- b) The purpose is to supply Moly-99 for medical needs for 36,000 seriously ill patients each day, and many thousands of other laboratory tests.

Making these points clear in advance of discussions with the states, and negotiations with Canadian officials, will result in a more gratuitous response. Also, emphasizing that the requests would only be used in an unlikely emergency will further enhance the probability of quick acceptance and no opposition.

Emergency Response Plan for Molybdenum-99 Production

6.0 ACTION PLAN

There are two key phases to implementing an emergency response capability. The first is to complete those initial steps necessary to confirm the feasibility of the emergency response option. These steps, as outlined below, are necessary for a go-no go decision to be made.

DOE

1. Draft Report to NE-1	2 weeks	1-27-95
2. Determine funding needs and options (diverting funds, etc.)	2 weeks	1-27-95
3. Define minimum required throughput & revenue stream required	2 weeks	1-27-95
4. Initiate Discussions with Nordion & AECL	Now	
5. Designate a central point of Coordination & Communication	Now	Savoie
6. Enroll Support from NE-1/Secretary/Etc.	4 weeks	2-10-95
7. Support MURR interactions with AECL	As Required	

SNL

1. Develop Resource Driven Schedule	2 weeks	1/27/95

Nordion

1. Review DMF	2 weeks	1-27-95

CORAR/MEMBERS

1. Review Regulatory Issues	2 weeks	1-27-95
2. Meet with DOE on 2-8-95		

Emergency Response Plan for Molybdenum-99 Production

MURR

1. Meet with AECL to determine feasibility of MURR option

T.B.D.

LANL

1. Evaluate Option 2 Issues vs. Option 1

2 weeks

1-27-95

Emergency Response Plan for Molybdenum-99 Production

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From the desk of...

Bobby Savoie

*This detailed write-up was
completed by Jim Ledbetter
(LANL) per the action plan.
It has not yet been
factored into the report.
Please review at your
leisure.*

Bobby

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DATE: January 20, 1995 **TIME:** 11:46

FAX NUMBER: (504-834-5890

TO: Joy St. Romain

FROM: Jim Ladbetter

MESSAGE:

This message consists of 10 Pages, including Cover

**M. Edgett, CRM-4, MS A150
MST-5 File**

Response to the Terminal Objectives of the Mo-99 Emergency Production Plan

James M. Ledbetter
Los Alamos National Laboratory
MST-5, Ph. (505)-667-4653

The following are responses to the Terminal Objectives for the Mo-99 Emergency Production Plan. Option 1 (SNL to produce raw Mo-99 and ship to NII) and Option 2 (Los Alamos to prepare raw Mo-99, from SNL irradiated targets, for shipment to NII) of the Emergency Plan were presented and voted upon during the meeting at SNL on 1/10-12. The Terminal Objectives that were defined were not debated due to a lack of time. A number of important considerations, that will determine the success or failure of the backup capability, must be discussed. Some of these important considerations are:

- 1.) Consolidation of irradiation and chemical processing in the GIF cells may not be a reliable backup option.

The probability of contamination incidents in the GIF hot cells at SNL during emergency production may deter or delay the schedule for regular full scale production. The Mo-99 separation process at Cintichem has demonstrated the likelihood of processing spills that contaminate the cell. The GIF cells at SNL are located in the same area as the ACRR Reactor. The reactor pool is connected to the interior of each cell. An assessment of the probability of a contamination incident and the impact on the facility should be considered. If a contamination event significantly impacts the reactor operation or the utilization of the confinement area, then it is imperative that we understand the probability and consequences of such an event.

- 2.) SNL's GIF Cells and the Los Alamos Hot Cells- a comparison.

A substantial amount of DOE funding and effort has been expended to establish a viable resource to separate and purify Mo-99 at Los Alamos. Operating experience has determined that the only way to process the isotopes in a manner that will satisfy the existing regulatory requirements is to provide primary containment. For the process, this primary containment must utilize an internal contamination barrier and a dedicated ventilation system. The cells at Los Alamos already have primary containment capability that can be put into service in the short term by utilizing the two new primary containment boxes located in the facility. In addition, the Los Alamos Hot Cells have recently undergone "Streaming Tests" which took six months to complete. These tests are required by DOE prior to the start up of new Hot Cell Programs. The issues of primary containment and streaming needs to be addressed at SNL. In particular, the feasibility of installing primary containment and the associated ventilation system in the SNL GIF cells needs to be addressed. The limited access to the cells may not allow such a system to be configured.

Interim storage of high activity waste is an issue at Los Alamos and SNL. At Los Alamos, up to 24, 55 gallon drums can be packaged and stored in adjacent hot cells (6 drums per cell, 4 cells). It is not clear how high activity waste can be safely removed from the GIF cells to an interim storage location.

The attached four drawings show the cell configuration and concept for backup Mo-99 production at Los Alamos. The Los Alamos Hot Cells already provide all the necessary equipment and facility compatibility to accomplish the task within the scheduled time frame.

3.) Los Alamos has targets available that can be qualified for irradiation in six months.

The target fabrication capability at Los Alamos has developed sufficiently to provide Depleted Uranium test targets in the next ten weeks. Call batch targets, (if needed) could be available by June 95, with pilot scale target fabrication of 10 to 14 target per week by August 95. The target gram weights will be limited to 13 to 21 grams. This is the present certified limit of the assay equipment. The maximum fabrication rate, in the short term, could be up to 20 targets per week. This production rate would require installation of additional platers in the pilot scale gloveboxes.

4.) Los Alamos has sufficient trained staff for Mo-99 production.
Staff qualification could be accomplished in the short term.

Los Alamos National Laboratory has been producing isotopes for over twenty years. There is a large cadre of available personnel experienced in hot cell operations and isotope chemistry to support the existing expertise in hot cell operations in the CMR building. Application of this personnel resource to Mo-99 production would have minimal impact on existing accelerator isotope production programs. It would only be necessary to qualify these highly trained personnel on the Mo-99 production chemical processing. This can be accomplished well within the time frame required to provide an emergency production capability.

5.) Transportation issues at Los Alamos and casks available.

The transportation personnel at Los Alamos have confirmed that irradiated target shipments in the B-3 casks are within the Cask's Certificate of Compliance (C of C). Since current plans do not require the use of OWR, no costly investment in cask liners would be required. Some internal radiation shielding may be needed if the external dose rate exceeds the specified external radiation limit for the cask. Nine thousand pounds of additional shielding is currently allowed by the C of C. The cost of the target shipping rack inside the cask and internal radiation shielding, if needed, would be minimal (approx. \$5,000).

There are two options for disposition of the waste from target processing at Los Alamos: i) Transport process waste back to SNL, so it can be included in the process waste stream that will eventually go from SNL to NTS, ii) Retain the process waste at Los Alamos. There is no technical limitation on the Los Alamos waste handling and storage capability.

The acceptability of either of these options has not been reviewed institutionally by Los Alamos or by DOE.

6.) The Hot Cell Facility at Los Alamos is fully operational.

The Los Alamos hot cell facility is operational. Decontamination and refurbishment of the Hot Cells for the Mo-99 program was completed eighteen months ago. All remote equipment e.g., rectilinear manipulators, master slaves, cranes, viewing windows, hydraulic systems, radiological instrumentation, and electrical systems, have been fully refurbished and continuously maintained.

7.) FDA Approval for Mo-99 production at Los Alamos will require little effort.

Because of existing isotope production activities, Los Alamos National Laboratory is registered with the FDA as an approved drug manufacturer. Our existing programs in Good Manufacturing Practices (GMP), required by the FDA, are easily transferred to Mo-99 production. This, combined with production using the existing "Clintchem- Drug Master File" now owned by the DOE, will streamline the FDA approval process. Ultimately, the timeliness of FDA approval will depend on close cooperation and support by the radiopharmaceutical manufacturers.

8.) NEPA issues at Los Alamos have already been addressed and no exemptions are required.

There are no known environmental issues associated with the processing of targets in the Los Alamos CMR Hot Cells. A NEPA review, performed for the Mo-99 program, resulted in the preparation of an Environmental Assessment. All operations that would be required in the CMR Hot Cells for emergency production were described in the original Environmental Assessment. The Environmental Assessment was under review by DOE Headquarters when the Mo-99 program at Los Alamos was put on hold pending resolution of Omega West Reactor issues. The Environmental Assessment should be reviewed/revised and resubmitted to DOE for approval.

9.) A Repair and maintenance program already exists at Los Alamos.

The facility presently utilizes an in-house capability for repair and maintenance of remote equipment, Hot Cell equipment, and Glovebox related equipment. All permanent service equipment (e.g., cranes, hoists, and etc.) is maintained as part of a laboratory wide program that complies with DOE Order requirements.

10.) The Operational Readiness Review (ORR) is already being planned for at Los Alamos.

Operational Readiness Review (ORR) will be performed jointly by the Laboratory and DOE prior to the production of Mo-99. The local area office has already agreed to support this ORR. Los Alamos had already assembled a team in preparation for completing the Operational Readiness Review for the Mo-99 program. Required programmatic documentation, procedures, etc. were being prepared. We estimate that 4 months will be needed to complete the documentation and the ORR.

11.) All equipment for the Quality Control (QC) Laboratory currently exists in the CMR building. A Quality Assurance (QA) Program is already in place.

As mentioned previously all required activities for FDA approval of Los Alamos, including QC/QA, as a drug manufacturer are in place. Transferring these programmatic requirements to the Mo-99 program can be accomplished well within the time frame required for emergency Mo-99 production. All instrumentation for the QC/QA program currently exists in the CMR building. Additionally, the Laboratory maintains an active QA instrumentation calibration program and a master Quality Assurance Program Plan. The MST-5 group that will operate the CMR Hot Cell facility already has a 5700.6C/10CFR830.120 compliant Quality Assurance Program Plan in place. Furthermore, MST-5 management is formally trained in implementation of ISQ 9000/ASI Q90 Quality Standards.

12.) There are no Competing Missions to be eliminated or resolved at Los Alamos.

At the present time there are no competing missions for the facilities proposed for this effort.

13.) All Radiological Monitoring Equipment at Los Alamos (CMR-Wing 9) is operational.

The radiological instrumentation necessary for the Mo-99 program has been procured as part of the Phase I facility upgrades and is in the last stages of installation. This instrumentation includes: particulate, iodine and noble gas monitoring for operating areas and the ventilation stacks. New fixed head monitors, Alpha CAMs, and Beta CAMs are being installed. Installation of these items will be completed by June.

14.) Waste issues are resolved at Los Alamos.

The waste issues for Mo-99 target fabrication and in-cell material processing and purification were addressed in the Environmental Assessment. Temporary, on-site, storage is acceptable.

15.) Industry Agreements with Los Alamos for Radiopharmaceuticals have been negotiated in the past.

Contracts with various Radiopharmaceutical Companies have previously been negotiated. Radiopharmaceutical manufacturing representatives and members of the Council on Radiopharmaceutical and Radioisotopes (CORAR) are well aware of the Los Alamos capabilities in radioactive material handling and chemical processing. They are well acquainted with our facilities. They have, uniformly, been very complementary of our Hot Cell and Chemical Processing facilities in both the CMR building and at the TA-48 Radiochemistry Site. We believe our facilities and capabilities will lend credibility to the emergency production effort. This would facilitate agreements with industry. Ultimately, industrial agreements would be the joint responsibility of the industry, the supplier to be backed up (Nordion), and the DOE.

17.) Procedures and Documents are well underway at Los Alamos.

Generic procedures for FDA approved isotope production are available from existing production activities currently regulated by the FDA and are readily transferable to Mo-99 production. Specific procedures related to production operations in the CMR building were in preparation when the Los Alamos effort was placed on hold. These efforts could be re-started and completed well within the time frame for emergency production.

18.) Los Alamos Management is prepared to continue its commitment to the Mo-99 Production Program.

Management is committed to the Mo-99 target fabrication program and continues to support accelerator isotope production activities. Los Alamos has always helped in meeting the emergency needs of the Nation.

19.) Target transportation to Los Alamos.

See Response #5 above.

20.) Public Opposition to the transportation of Medical Isotopes and irradiated components has been addressed at several public meetings.

It should be noted that nuclear material transport is already being done, on a regular basis, in compliance with DOT regulations. If a concern were expressed, it should be resolved within a six month time frame. Shipments of materials between Los Alamos and Sandia should not be any more difficult than any other shipments. However, public opinion is subject to change. Public opinion of the emergency backup plan is unknown and should be formally addressed.

21.) Waste transportation to SNL from Los Alamos.

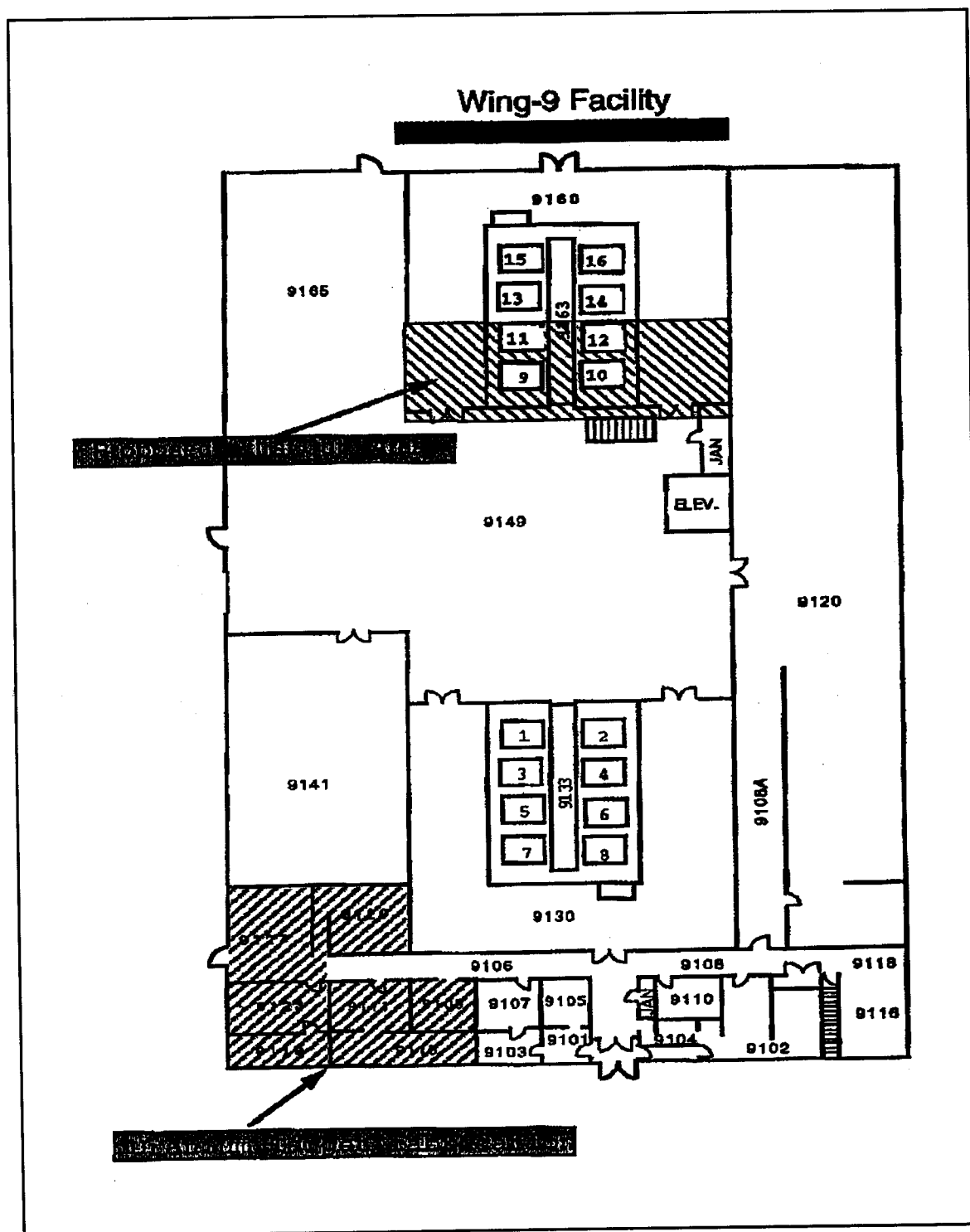
If Los Alamos is a part of a funded program that produces waste, then Los Alamos will provide temporary on-site waste disposition.

22.) Completion of CMR Upgrades in Wing-9.

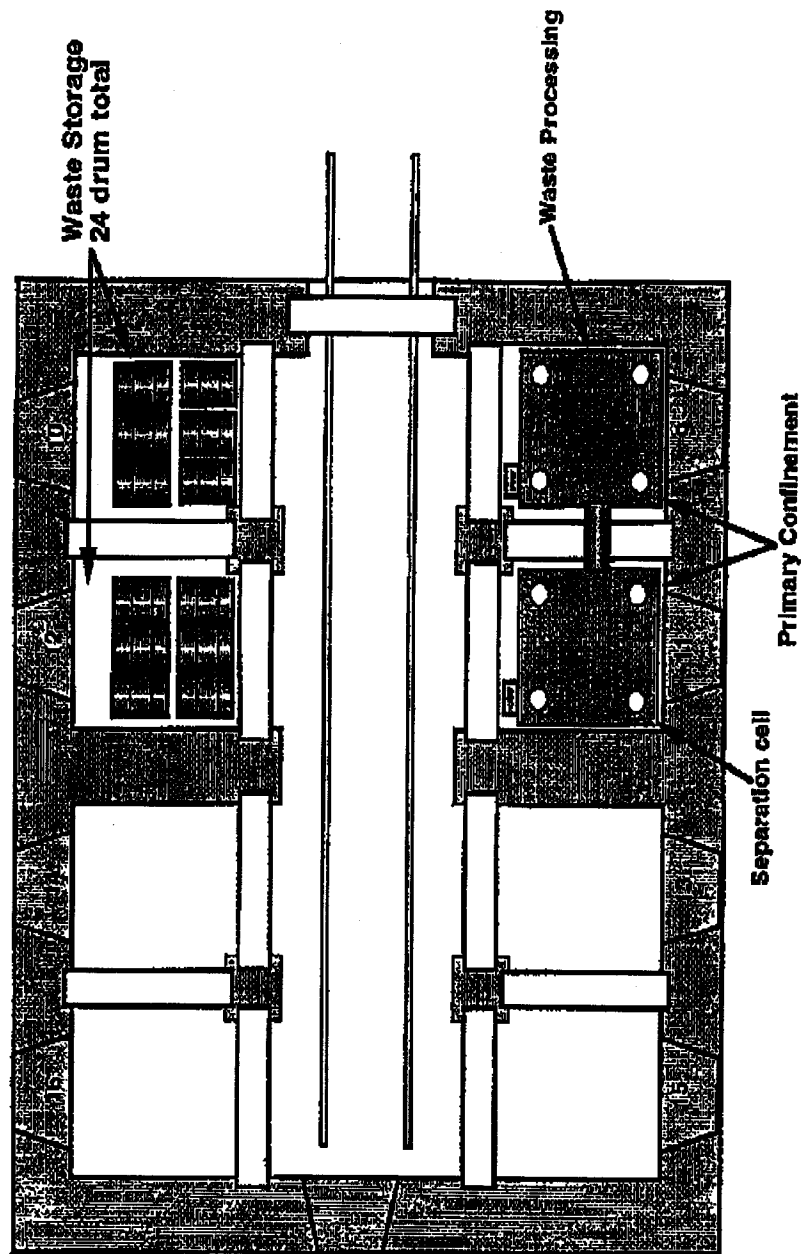
The completion of the CMR upgrades in the Hot Cell Facility is proceeding at the present time with Phase I nearing completion. Phase I included the replacement of electrical systems and radiological instrumentation. The radiological instrumentation upgrade has also included the installation of instrumentation for uranium target fabrications and the processing of medical isotopes in the Hot Cells. The Los Alamos Hot Cells Upgrades are 99% complete.

23.) Defense Nuclear Facilities Safety Board (DNFSB) Issues.

Operations at either Los Alamos or Sandia will need to be reviewed and approved by the DNFSB. At Los Alamos, we have a long established baseline for the operation of nuclear facilities and for the chemical processing of Actinides and irradiated materials. Los Alamos has a technically sound approach that, based upon past experience, should be acceptable to the DNFSB.



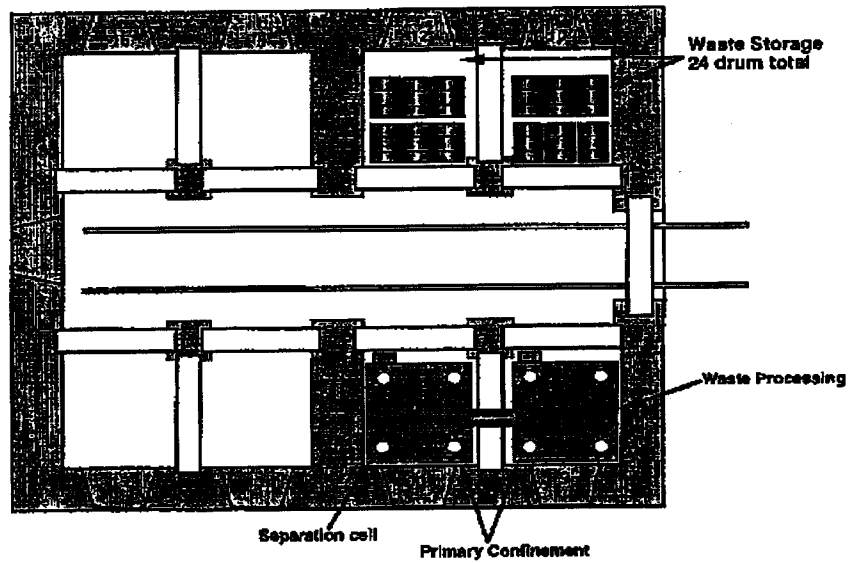
Los Alamos Mo99 "First Cut" Proposal



West Bank Plan View

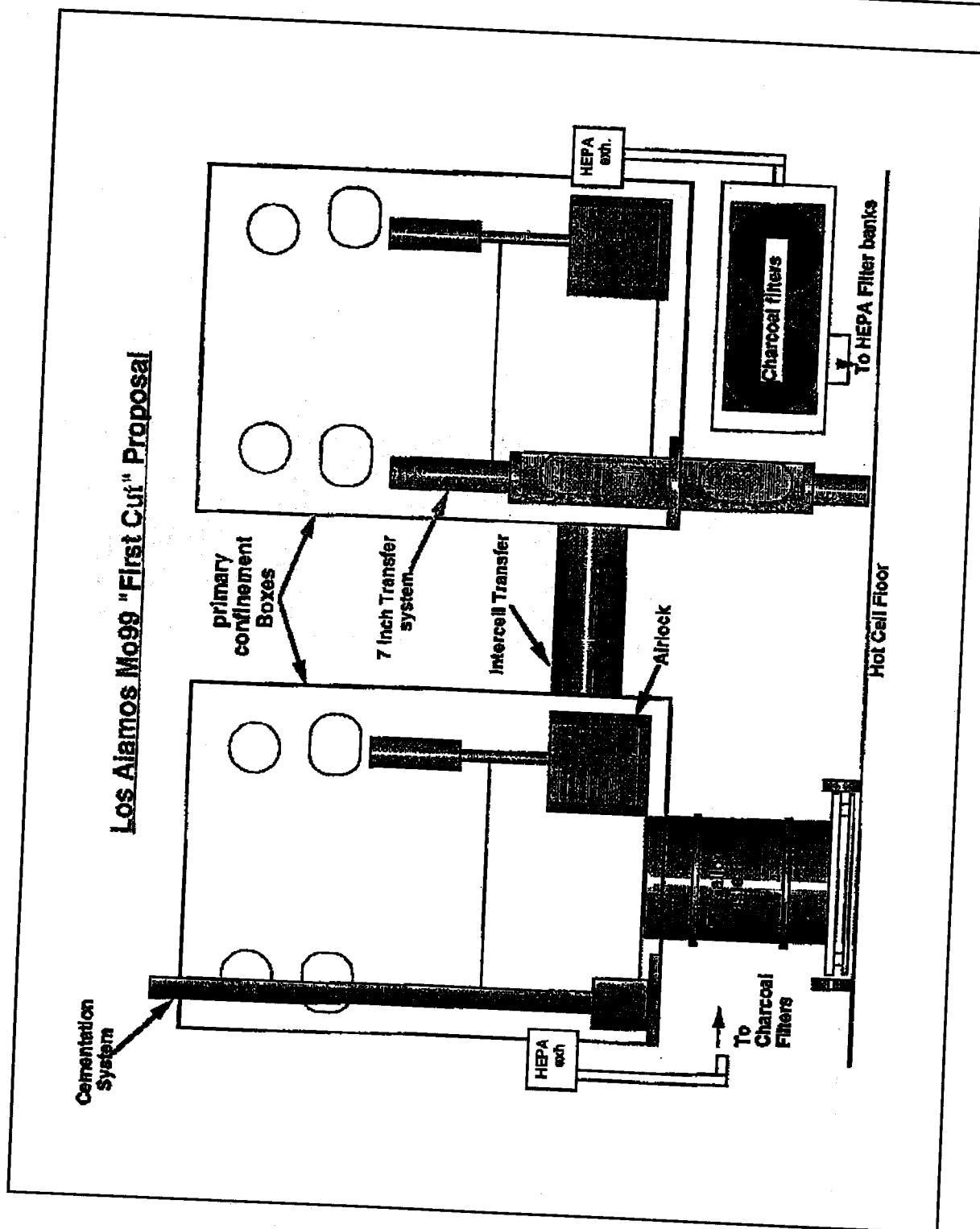
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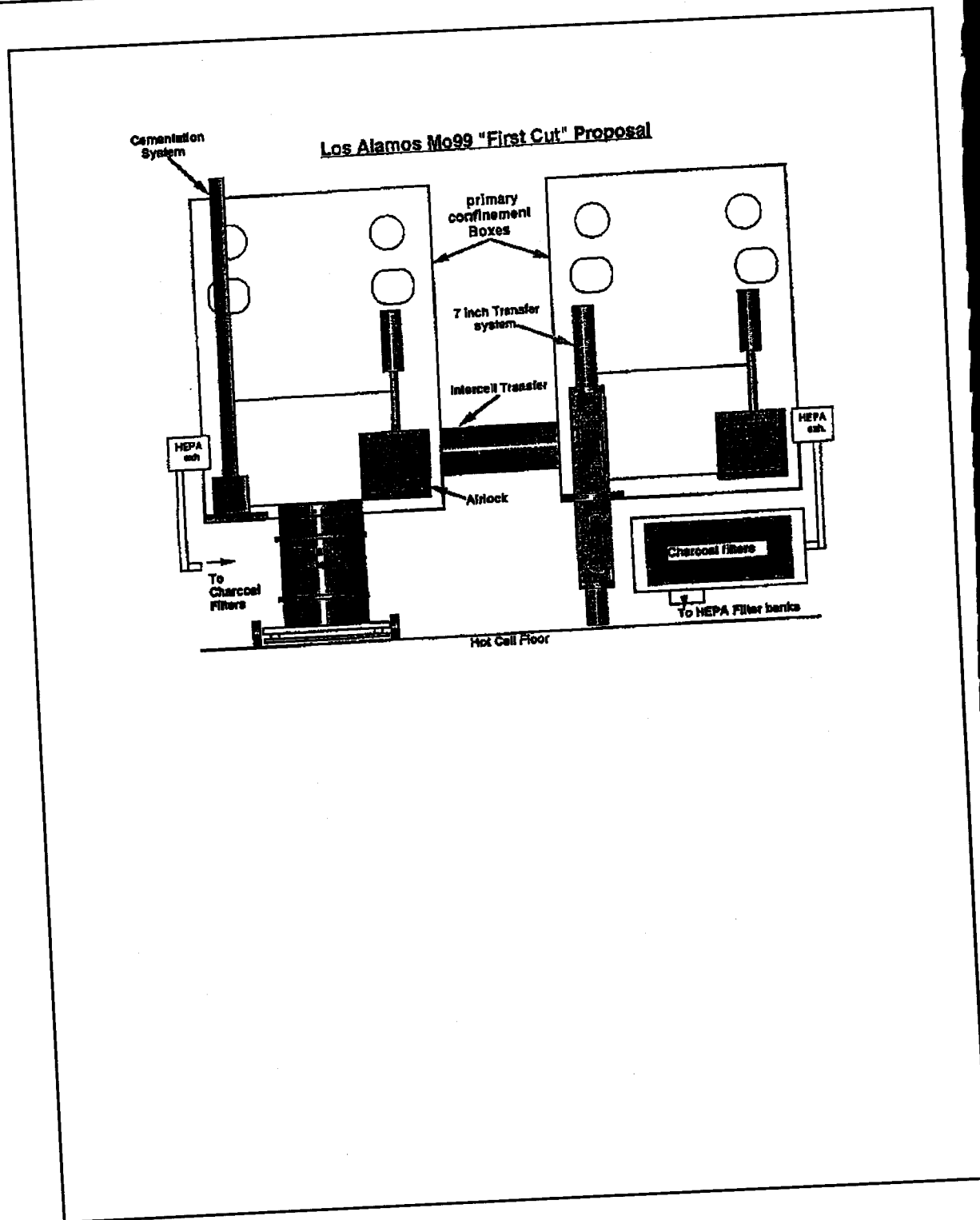
Los Alamos Mo99 "First Cut " Proposal

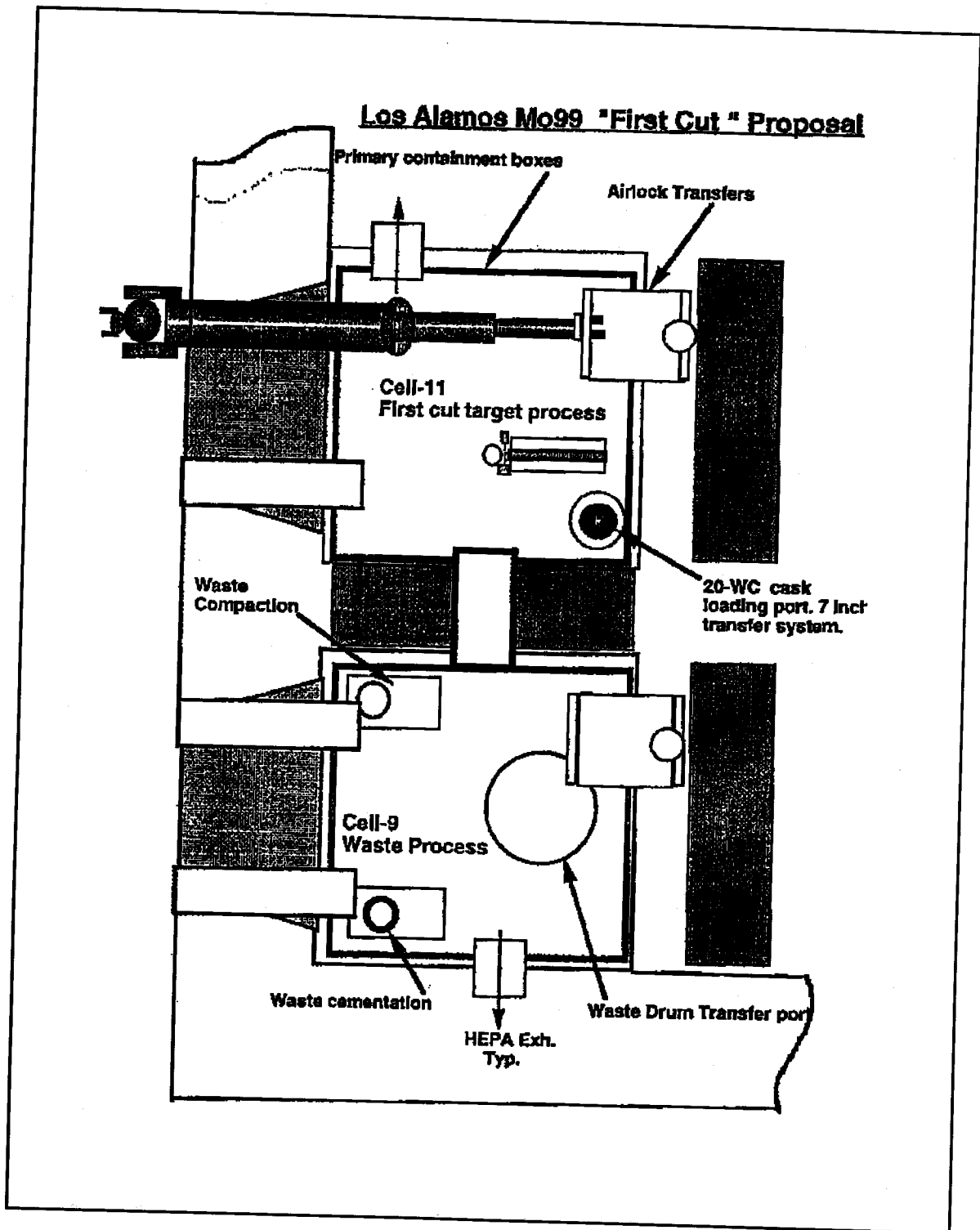


West Bank Plan View

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The Future Supply of Molybdenum-99

Since 1991, nuclear medicine physicians across the United States and much of the world have relied entirely on one 38-year-old nuclear reactor in Canada for the production of ^{99}Mo , the isotope used in $^{99\text{m}}\text{Tc}$ generators. This situation came about quietly in the 1980s as alternate suppliers dropped out of the market, leaving Nordion International Inc. in Kanata, Ontario as the major supplier in the world. While Nordion has managed to maintain a steady supply of the essential material to radiopharmaceutical makers, a series of reactor failures and labor disputes have come close to halting production several times at the facilities that produce isotopes for Nordion in Chalk River, Ontario.

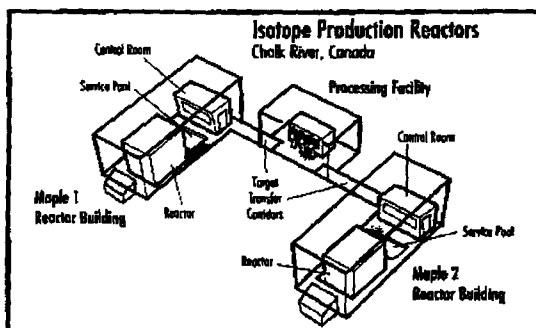
After four years during which nuclear medicine professionals had concerns about the reliability of ^{99}Mo supplies, several major initiatives to bring new production reactors on-line are finally getting off the ground. Nordion officials say they will soon resume construction on two new 10 megawatt reactors that will be dedicated entirely to isotope production. Pharmaceutical giant Mallinckrodt Medical recently obtained a license in The Netherlands to begin upgrading a reactor for ^{99}Mo production for their own supply. Moreover, the U.S. Department of Energy (DOE)—despite severe budget-cutting pressures from Congress and the Clinton Administration—has sustained efforts to convert a reactor formerly used for weapons research into a back-up supplier for ^{99}Mo .

"For now, we're still vulnerable if anything catastrophic happens to Nordion's NRU reactor. But at least there seems to be definite plans on the table," said Wynn Volkert, PhD, chairman of the Society of Nuclear Medicine's committee on radioisotope supply and professor of radiology at the University of Missouri. "There are options now that we didn't have a few years ago."

Representatives from radiopharmaceutical companies are expressing similar optimism tinged with some reservations. They say all of the new initiatives will require at least a year or more before they will result in facilities capable of producing ^{99}Mo . "That means there is still a very significant period of risk for the next couple of years," said William Ehming, a vice-president with Medi-Physics Inc., a unit of Amersham. Other industry executives point out that the building of any new facility is bound

to bring increases in the price of molybdenum. The exact amount of the increase that will come from the proposed plans as well as the pass along increase in cost for technetium generators remains unclear.

Regardless of the current concerns, both radiopharmaceutical manufacturers and nuclear physicians recognize the need for a reliable back-up supply of ^{99}Mo . They know that a steady supply of ^{99}Mo is crucial to the practice of nuclear medicine. In fact, $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$ generators are used in more than 80% of clinical nuclear imaging procedures. Move-



over, the parent isotope has a 67-hour half-life, so it cannot be stockpiled. This is why the nuclear medicine community has for years been pushing for an alternative source of ^{99}Mo in the event that Nordion's supply was ever halted. What follows are updates on the three biggest ^{99}Mo production ventures.

Nordion's Plans for Maple-X

With plans drawn up to build a new reactor facility, Nordion executives may have felt even more compelled to get their plans off the ground after a glitch occurred in the aging NRU reactor at Chalk River last April. Production was halted for five days when a fuel rod became stuck and could not be readily withdrawn from the reactor. Nordion managed to maintain shipments to generator manufacturers by calling on a back-up agreement with the Institut National des Radioelements (IRE) in Belgium. IRE provided material for use in Europe and supplies were ready for emergency approval

This diagram illustrates Nordion's proposed plans to build a new reactor facility for the production of ^{99}Mo . The site will have two identical reactors and a processing facility.

POTENTIAL NEW SUPPLIERS OF MOLYBDENUM-99 IN THE FUTURE

Supplier	Reactor	Power	Target date	Project cost	Production capacity
Nordion/AECL Chalk River, Ontario	Maple-X (new)	10 MW	~1998	\$140 million	Up to 100% world demand
U.S. DOE Sandia National Lab New Mexico	ACR (upgrade)	4 MW	mid-1998	>\$11.4 million	Up to 70% U.S. demand
Mallinckrodt Medical The Netherlands	HFR	45 MW	1998	N/A	About 25% world demand and more if needed

The chart above outlines the three biggest initiatives world wide concerning the production of ⁹⁹Mo. All aim to ensure a reliable supply.

by the Food and Drug Administration in the U.S., but the NRU became functional before this was necessary.

Nordion officials now say they have secured an "agreement in principle" with Atomic Energy of Canada, Ltd. (AECL) and the government of Canada to resume construction of two new reactors at Chalk River. Back in 1993, AECL tried to cancel the Maple-X project and halted construction after spending \$40 million on planning and other work. Nordion and its parent company MDS

Health Group Ltd. filed a breach of contract lawsuit against AECL. The suit has not gone to court yet, but the parties have been engaged in arbitration hearings where they have forged a tentative agreement. "There are some outstanding details to be worked out," said Nordion spokesman Ian Murnford.

The latest plan, calls for building two, 10 megawatt reactors and a new processing plant committed entirely to isotope production at a projected cost of \$140 million.

Constructing and getting the first Maple reactor up to full power will take three years, and no start date has been set for the construction. The second Maple-X reactor will be completed a year later. To finance the project, Nordion officials originally said they would have to raise the price of molybdenum by 40% in October 1995. In September, they announced that the increase would be "something less than 40%" and that the company would delay the increase until January of next year when the agreement with the Canadian government should be finalized. (See *Newsline*, October 1995, p. 32N)

Without firm figures, radiopharmaceutical makers are reluctant to estimate how the increase would affect the cost of generators. Molybdenum accounts for about 30% to 60% of the cost of manufacturing a generator. This will mean an increase in hospital budgets at a time when administrators are being pressured by managed care consultants to cut costs. Nordion's three biggest U.S. customers, Dupont Merck, Amersham and Mallinckrodt, have recently informed their own customers about the possibility of a future increase in the cost of ⁹⁹Mo/^{99m}Tc generators and ^{99m}Tc unit doses and are awaiting their feedback. Ehrig acknowledges that the price increase may be a cause for con-

(Continued on page 33N)

The Birth of Technetium—By Mail Order

The reference to ⁹⁹Mo as the "parent" of ^{99m}Tc makes complete sense, since ^{99m}Tc was literally born from ⁹⁹Mo. In 1937, Emilio Segre and C. Perrier received a small package sent to their Italian laboratory from the Lawrence cyclotron at Berkeley, CA, which contained ⁹⁹Mo targets that the two scientists had previously sent there to be bombarded with deuterons. Segre and Perrier dissolved the target in a solution of one part nitric acid and three parts hydrochloric acid. They then added manganese salts and allowed the resulting metals to precipitate. The result was a new element with a half-life of 8 hours. Since the element had to be manufactured in the laboratory, its creators dubbed it "technetium," which derives from the Greek word *technetos*, meaning artificial.

Perhaps a more fitting name for ^{99m}Tc would have been "freedomium," since Segre was able to use his discovery as a ticket out of fascist Italy to gain entrance into the U.S. Segre persuaded Italian officials to allow him to travel to Berkeley to manufacture vast quantities of the element—which he emphasized was bringing scientific fame to Italian soil. The officials were not aware that Segre was indeed able to produce ^{99m}Tc in his Italian lab by sending shipments back and forth to the Lawrence cyclotron. It was this duplicity that allowed Segre to emigrate in 1938 and enabled him to join his mentor, the Nobel prize winning physicist Enrico Fermi. Fermi had left Italy for the U.S. the previous year, after he convinced the Italian government to allow his family to travel to Stockholm with him as he accepted the Nobel prize.

—Adapted from Marshall Bruce's *A Chronology of Nuclear Medicine* (St. Louis: Heritage: 1990).

News Briefs

NEWSLINE

Diatech Receives \$10 Million for Peptide Research

In a deal that may signal the beginning of a new trend for radiopharmaceutical start-up companies, Diatech, Inc. in Londonderry, NH, recently announced that it had received a \$10 million investment from Hafslund Nycomed, a large company based in Oslo, Norway that makes contrast media products. Under a five-year cooperation pact with an estimated potential value of \$50 million to Diatech, Nycomed's initial investment will ensure

a 17% stake in Diatech's peptide imaging drugs market.

Diatech currently has six peptide products that are in various stages of clinical trials, including P-280 which is in Phase III trials for the detection of deep vein thrombosis. The other peptides are in Phase I and II stages and are being tested as diagnostic agents for pulmonary embolism, somatostatin receptors in endocrine tumors, atherosclerotic plaque and infections of unknown origin. Diatech has not yet submitted any of its peptide products to the FDA for approval. "Nycomed's investment will significantly underwrite the cost of conducting studies

for FDA approval," said Brad Miles, a spokesperson for Diatech.

He said Nycomed will make additional payments if Diatech's products win regulatory approval. "This is a giant company that was never involved in nuclear medicine, and this is their first leap into this area," said Miles. Nycomed executives recognize the promise of an imaging tool that could pinpoint diseases at an earlier stage and illustrate disease progression at a cellular level with greater sophistication than existing technology, including contrast media agents that Nycomed markets for x-rays and ultrasound. ■

Supply of Molybdenum-99 (Continued from page 22N)

cern among nuclear physicians, but he feels the new facility will be worth the extra cost. "My gut feeling is for people using unit doses out of a radiopharmacy the cost increases won't add more than a couple or three percent to their budget," said Ehlig. "And I can't think of a better way to assure a more secure supply."

The DOE's Proposal to Convert Sandia

For years, SNM leaders and other nuclear medicine leaders have been urging the DOE to build a reliable back-up facility for the production of ⁹⁹Mo. The DOE is currently preparing an environmental impact statement (EIS) on the production of ⁹⁹Mo. The department's preferred alternative is the annular core research reactor (ARR), a 2-megawatt reactor at Sandia National Laboratories in Albuquerque, New Mexico. By upgrading the Sandia reactor to 4 megawatts and adding processing equipment, Wade Carroll, the EIS Project Manager at DOE, said the DOE could provide 100% of the U.S. demand for molybdenum on a short-term basis. Carroll said the department is not planning to re-enter the market as a competitive supplier. "It would strictly be a back-up at this point," he said.

Given Nordion's plans to build a Maple-X reactor to be used solely as a back-up, the DOE's current plans to ensure a back-

up supply may seem duplicative. DOE officials say they are acting on a need expressed in the nuclear medicine community and that the U.S. cannot rely on the Nordion proposal to build the two reactors to assure an adequate U.S. supply in the future. Carroll said that a decision by the DOE is expected early next year on whether or not the department will produce ⁹⁹Mo and, if so, at what facility. "If Sandia is selected, production of moly could occur by October of next year at the earliest," he said.

Some industry observers remain skeptical of the DOE's effort. They say the project is bound to be delayed for months, if not longer, by the DOE's decision to put together a full-blown EIS. More than a few observers have expressed dismay at what they consider a lack of responsiveness from the federal agency. "We don't feel like they are listening to their customers," said Ehlig. The major concern is that DOE has moved too sluggishly to be of much help. "The DOE has great plans, and I have no doubts about their good intentions, but I do have doubts about their budget," said Peter Vermeeren, general manager of Mallinckrodt's nuclear medicine division.

Mallinckrodt: A New Producer of Moly?

In August, Mallinckrodt received a license from the Dutch nuclear regulatory

agency to begin work on medical isotope production at facilities in Petten owned by the Joint Research Center of the European Community, according to Vermeeren. The company started a trial production run in September as a step in gaining approval from the FDA to provide ⁹⁹Mo for generators marketed in the U.S.

"We expect to produce moly by the beginning of 1996," Vermeeren said. "We will then be able to use our own moly in Europe and in the U.S. when the FDA approves it." Mallinckrodt launched their plans about three years ago in an effort to create a secure supply of ⁹⁹Mo to ship generators to their customers. Vermeeren said Mallinckrodt is planning to produce only enough molybdenum to supply the company's own needs. Mallinckrodt supplies about 25% of the global market for ⁹⁹Tc generators, he said, and about 20% of the U.S. market. "We are not out to conquer the world market for moly production," he said. "We're just trying to create a more stable situation and a more acceptable situation for our customers worldwide." In the event of a sudden shutdown of the NRU reactor in Canada, Vermeeren said, "it would be possible for IRE and Mallinckrodt to crank up production to supply the world."

J. Rojas-Burke

Newsline

35N

Dear Society Member and Fellow Professional:

Nuclear medicine and industry leaders have been concerned for several years about possible interruptions in the continued reliable supply of ^{99}Mo to the medical community. This concern arose from the realization that the current Nordion production facility, located in Chalk River, Ontario, Canada, is nearing the end of its useful life. At present, Nordion is the principal worldwide supplier of ^{99}Mo , and no other facility is currently capable of producing sufficient amounts of this radionuclide to meet needs on an immediate basis.

We are pleased to report that Nordion, after consultation with the nuclear medicine industry and the profession, has adopted a plan to build two new reactors for ^{99}Mo production that will not only provide a fail-safe system by the constant availability of a standby reactor but also incorporate a new process to better manage radioactive waste. This plan will assure a reliable long-term supply of ^{99}Mo . The reactors will be located on Atomic Energy of Canada, Ltd. (AECCL) property, but will be owned and operated by Nordion. It is projected that the two new reactors, to be called Maple I and Maple II, will come on line by 1998. We support this plan as an essential investment in the future of nuclear medicine.

The cost of building these new reactors is significant. In order to pay for this project, Nordion is constrained to increase the cost of ^{99}Mo to all ^{99}Tc generator manufacturers. Nordion discussed with the nuclear medicine leadership the price increases that necessarily accompany their comprehensive program for guaranteeing a reliable high-quality supply of ^{99}Mo . While we are concerned about how this cost increase will be passed on to nuclear medicine facilities, third-party payors and patients, the nuclear medicine leadership feels that Nordion has dealt with this important problem in a responsible manner and concedes that a modest price increase is an acceptable alternative to lack of a reliable supply of ^{99}Mo . Since the price of ^{99}Tc generally contributes a small portion of the overall cost of a clinical nuclear medicine study, the total increase in procedure costs is expected to be modest.

Peter T. Kirchner, MD, President
Society of Nuclear Medicine

Robert F. Carretta, MD, President
American College of Nuclear Physicians

Responses to Comment Letter C068

- 1 The Department of Energy's proposed action in this environmental impact statement addresses the near-term requirements of a backup supply of Mo-99. It does not focus on a long-term plan. Regarding the emergency response plan cited in the comment, this plan was developed as a predecisional draft by a consultant to the Department, but was never formalized or adopted by the Department. Section 3.2.2 of the EIS has been modified to reflect the comments on the current status of Nordion's proposed actions.
- 2 At the time of this writing, Nordion still had not formally announced that they were going to resume construction of the Maple reactor complex. Nordion has informed the Department that construction and commissioning of Maple I would be completed about 3 years after an announcement is made and that FDA approval of Nordion's new Mo-99 production process is expected to be accomplished within that same time frame. The Department's estimate of 42 months was based on Maple I and the new processing facility reaching full production capability rather than an initial yield of product. Section 3.2.2 has been revised to more accurately reflect Nordion's stated position.
- 3 The Department believes that the discussion of the waste generation in the EIS is accurate. The waste generated during target processing is stored and allowed to cool for 6 months to a year before processing or disposition, at which time it meets the requirements of 10 CFR 61.54 to be categorized as "Class-C" low-level waste and meets the suitability requirements for near-surface disposal.

Further, DOE does not believe the waste generated is understated in the EIS. Calculations have been made to confirm the amounts of the fission products that would be produced from the targets. It should be noted that the volumes given are typically compacted and/or crushed volumes.

After the Maple I and II facilities and the new separation facility are built and in operation, appropriate waste figures can be attributed to that operation. Until then, the current process used by Nordion/National Research Universal is waste-intensive compared with the Cintichem process. The Department acknowledges Nordion's strong commitment to waste minimization as evidenced by Nordion's plans to employ in its proposed facilities a process similar to the Cintichem process (see Section 3.2.2).

- 4 The summary has been revised to clarify that the passages in question refer to production of Mo-99 by domestic (U.S.) private companies.
- 5 The Department is aware of the actions Nordion has taken in an attempt to narrow the window of vulnerability, and Section 3.2.2 has been updated to reflect the current world supply situation. The Department appreciates and welcomes these actions. However, even with these efforts, it is still the Department's view (as well as the view of the U.S. medical community) that there continues to be an inadequate backup foreign supply capability to meet U.S. demand for Mo-99 should the current source become unavailable for any extended period of time.

The Department understands that if Nordion's current source for Mo-99 were to become unavailable, Nordion has arrangements with other sources that could supply a portion of the U.S. demand. However, these sources are not capable of supplying more than about half of the current U.S. demand.

- 6 The Department believes that it is prudent to establish a production capability that could supply 100% of the U.S. demand in case of a Mo-99 supply shortage. Regarding the offer of cooperation, the Department

has kept Nordion apprised of the status of the Department's NEPA process and has been in contact with Nordion regarding plans for Mo-99 production. The option of shipping Mo-99 to Nordion for final product testing and distribution has been discussed with Nordion, is presented in the Summary, and is evaluated in Section 5.11 and in Appendix B of the EIS.

The EIS project team contacted radiopharmaceutical companies and asked the specific activity required when the product reached their loading dock. The companies provided an answer "in the range of 10,000 curies/gm." Further, when SNL/NM was preparing its environmental assessment, SNL/NM contacted the customers and asked the same question. The answer was the same, "in the range of 10,000 curies/gm." Pursuing a more definitive figure from the customers did not yield a more definitive answer.

The Missouri option was also eliminated from consideration because of the schedule on which it could deliver Mo-99. Missouri, irradiating one bundle per week, cannot supply the current market demand on a continuous basis. It can supply the pharmaceutical houses with more than 3000 six-day curies in one single lump delivery, but it cannot supply 3000 six-day curies with the deliveries spread evenly over five days. Without a significant upheaval in the way the medical community currently conducts business or without a fuel design change, Missouri cannot meet the industry demand. This analysis is given in Section 3.4.2.1.

- 7 The Department is aware of the proposed Nordion plans for new reactors. Discussions and press releases regarding these reactors have been issued for some time. Cost estimates for these reactors approach \$140 million dollars. Uncertainty has surrounded the ability to secure this funding and to reach construction agreements with Atomic Energy of Canada Ltd. It is the Department's understanding that Nordion is now in disagreement with the Canadian government regarding the tax treatment of the new reactors. These factors, combined with the Department's position that the U.S. is currently in a window of vulnerability, continue to require progress toward developing a backup capability to Nordion's current sources of Mo-99.
- 8 The Department believes that, as stated in the Jupiter report, Mo-99 production in the long-term should be conducted by the private sector. As stated in the EIS, the Department encourages private sector production of Mo-99, and if the private sector begins reliably producing Mo-99 in the U.S., the Department would phase out its production. The Department has simply proposed to establish a production capability to act as a backup to the existing Canadian supplier. The intent is not to compete with Nordion.

1581 Golden Gate
Pocatello, ID 83201
February 04, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U.S. Department of Energy
Officer of Isotope Production and Distribution, NE-70
19901 Germantown Road
Germantown, Maryland 20874

Dear Mr. Carroll

This letter requests an extension of the February 9, 1996, deadline for comments on the Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes Draft Environmental Impact Statement. Specifically, I request that you consider my comments that will be submitted by February 30, 1996. I was late to identify the Moly 99 project had an alternative that could potentially affect the area in which I live. My preliminary review raises the following concerns.

- 1 • Section 2.1 (Purpose and Need) states the long term goal is that production of Mo-99 in the U.S. should be conducted by the private sector. In selecting their preferred alternative, it appears that DOE has not put enough weight on the fact that the INEL is the only alternative that the private sector has expressed interest in participating. As stated in the Draft EIS, there is a lease agreement with the Idaho Brain Tumor Center to perform boron neutron capture therapy at PBF. Additionally, Idaho Brain Tumor Center has expressed interest in a shared cost venture. To meet DOE's long term goal of privatization, it appears that the INEL alternative is a more logical choice.
- 2 • It appears that DOE selected the preferred alternative before triggering the NEPA process. The problem DOE is attempting to solve is an unreliable supply of Mo-99. Selecting Sandia as the solution to the problem appears to violate the spirit of NEPA.

I need more time to review the Draft EIS and fully research the above concerns. A response to my request would be appreciated.

Sincerely,


Brad L. Swanson

Responses to Comment Letter C069

- 1 Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis.
- 2 The Department has not made a decision regarding if and where to conduct the proposed project. A preferred alternative is identified in an EIS, in essence, to tell the public which way the Department is leaning on a decision, but it does not mean that the decision has been made. Further, Council on Environmental Quality regulations require Federal agencies to identify the preferred alternative in a Draft EIS if the agency has one, and require that the agency identify a preferred alternative in a Final EIS.

The Annular Core Research Reactor/Hot Cell Facility combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.

100 North Morningside Drive
Idaho Falls, ID 83402

February 6, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U. S. Department of Energy
Office of Isotope Production and Distribution, NE-70
19901 Germantown Road
Germantown, MD 20874

Dear Mr. Carroll:

May I express my appreciation to you and your staff supporting the recent hearings in Idaho Falls related to the "Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes Draft Environmental Impact Statement." I had the opportunity to present comments orally the evening of January 17, 1996 and am following with written comments to expand on my earlier thoughts. In both cases, I am acting as a private citizen. This letter presents two general concerns and four specific concerns for your consideration in the project's record of decision.

General Concerns

1. In view of Secretary O'Leary's emphasis on "privatization" of DOE activities, I am significantly concerned that near-term isotope production "privatization" was not included as a criterion, and further, as a weighted criterion. Not only is it feasible, but in the situation at the INEL, the Idaho Field Office has already signed an agreement for "privatization" of the Power Burst Facility (PBF) reactor for medical therapy use. As one associated with a separate DOE "privatization" project, I have first-hand knowledge on this emphasis being pushed by the DOE. I recommend the near-term "privatization" criterion be added to the decision criteria.

2. Cost-sharing of related project work should be considered as an added criterion, or, as a minimum, include such activities in the cost analysis to show more appropriate benefits to the taxpayer. With the shrinking budgets, the DOE is needing to be creative on how to get more with less. Breakthroughs in thought or paradigm shifts are necessary generally to realize such goals. As in the case with the "privatization" of the PBF for use in Boron Neutron Capture Therapy (BNCT), I suggest that DOE obtain a commitment proposal so that a cost-sharing effect could be better evaluated in reaching a final decision on the medical isotopes project.

Specific Draft EIS Comments

3. Page viii (Summary): Regarding the statement "The conversion from HEU to LEU for the 3 alternatives discussed could be a relatively simple and inexpensive undertaking.", I question the accuracy of the statement and find it misleading. There is redesign of the core and the associated safety basis to be accomplished and authorized. Further, reducing the fuel density that would be involved would reduce the neutron flux available and thus the reactor's effectiveness.

4 | 2. Page xiii (Summary of Safety Consequences): While I agree that all options shown in the document can be done safely, the INEL option is more inherently safe because of the large distances to any population centers. The tables in Appendix C.1 dramatically show the preference for the INEL sites compared to the other options. I know from personal experience the closeness of the SNL option to the International Airport and City of Albuquerque and the Los Alamos option with the City of Los Alamos. For example, the shortest route between Los Alamos and TA-2, site of Omega-West reactor and below in the Los Alamos canyon, is by hang-glider.

5 | 3. Page 4.83 (Section 4.4.7.2): For accuracy of presentation, the prototype reactors at the Naval Reactors Facility (NRF) and EBR-II at Argonne-West National Laboratory (ANL-W) have been shutdown and are planned to no longer operate. It is likely that any emission releases by restarting PBF will be less than what these "shutdown" reactors historically emitted and should be addressed accordingly.

6 | 4. Page 6.1 (Section 6.1): The discussion indicates that all options would be under the DOE regulatory system. Under a "privatization" approach that would likely exist with the PBF option, the regulatory process would be under NRC license. It is my understanding that the NRC process is written into the agreement. This approach would also reduce the DOE oversight, thus a DOE cost reduction not available by the other options. This benefit should be considered in the overall cost picture.

7 |

Yours truly,


Roderic W. Thomas

Responses to Comment Letter C070

- 1 The Department intends to operate as a backup to the Canadian supplier. The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE. The Department is aware of this potential for the INEL alternative. Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.
- 2 The EIS presents cost information only for the proposed Medical Isotopes Production Project at each of the alternatives. The Department recognizes that facilities proposed for use in all of the alternatives under consideration could conduct other cost-sharing activities; however, these other cost-share activities and their impacts are outside the scope of the EIS and therefore are not considered in the EIS.
- 3 It is true that many research reactors do not perform as well using low enriched uranium fuel. Some cannot operate at all on low enriched uranium because they cannot accommodate enough low enriched uranium fuel in the reactor core. If the fuel and core design has not been completed, then the process is not trivial. However, the core and fuel redesign has been completed for the three alternative reactor facilities that are fueled with highly enriched uranium, and the necessary calculations are complete. The safety documentation for the affected reactor would have to be revised to reflect the change to low enriched uranium fuel. The cost to revise the safety documentation is included in Section 5.22. The core average flux reduces approximately as a function of the ratios of the core volumes with highly enriched uranium and low enriched uranium, respectively. Core power is basically fissile material density times flux times core volume. Slightly more total fissile material per core is normally used to compensate for the reduction in thermal utilization factor caused by the increased uranium-238, but the material is spread out over a somewhat larger core. To keep fission rate constant, the total number of neutrons available to cause fission must go up because of some parasitic capture in the fuel, but again this total number is spread out over a larger core volume. Because of the smaller core buckling of the larger core, some compensation is made by a reduction in leakage neutron loss. The result is a decrease of approximately 20% of the average flux. Reactors that have already converted have typically seen this type of decrease.
- 4 The benefits of locating the facilities in a remote location are reflected in the largely lower radiological consequences for normal operation and accidents at the facilities.
- 5 The radiological air quality section is based primarily on information in the Spent Nuclear Fuel Programmatic Environmental Impact Statement (DOE 1995b), which reflects site operations in 1991 updated to include some facilities that were expected to begin operation during 1995. The change in status for facilities noted in the comment is acknowledged; however, this information would not affect analyses or conclusions reached in the EIS.

Estimated emissions from the Power Burst Facility (PBF) were based on historical data scaled up for the increased operating time expected if medical isotope production were implemented there.

- 6 As stated above, the IBTC has not made a formal proposal to the Department regarding the dual use of the PBF. Therefore, the Department cannot say for certain whether operation of the PBF would be conducted privately (by IBTC) or by DOE. In developing the EIS, the Department assumed that if the PBF were selected for the isotope production mission, DOE would operate the reactor under DOE regulations.
- 7 The Department is currently preparing a separate response to an independent report that recommended that oversight of DOE operations be conducted by an outside body (e.g., the Nuclear Regulatory Commission [NRC] or the Defense Nuclear Facilities Safety Board). Therefore, it is possible that the NRC would be the regulator regardless of who (DOE or IBTC) restarted and operated the reactor.



LOS ALAMOS COUNTY

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COUNTY COUNCIL

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Linda Mair

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Jim Greenwood

Norma S. Pongratz

COUNTY ADMINISTRATOR

Alex Georgieff

February 6, 1996

Mr. Wade Carroll, MIPP
EIS Document Manager
Office of Nuclear Energy, Science and
Technology, NE-70
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874

Dear Mr. Carroll:

The Council of Los Alamos County endorses the Los Alamos proposal for utilizing the Omega West reactor for production of Molybdenum-99. We believe the U.S. should have a source for this valuable medical isotope within its borders. The Los Alamos solution to this has the immediate potential of producing 50% of the U.S. needs which is the break even point so that Department of Energy (DOE) will not have to subsidize this operation.

The people in Los Alamos have lived with this reactor for 37 years and would not view it as the threat that has been expressed in other communities competing for this project.

Since it is the DOE's plan to privatize this process in five to ten years; this production of these medical isotopes provides an opportunity for a business to spin out of Los Alamos that will provide jobs for North Central New Mexico. Shing this entire process at Los Alamos will accomplish another goal of DOE; that is for Los Alamos to move toward self sufficiency.

Sincerely,

A handwritten signature in dark ink, appearing to read "Alex Georgieff".

Alex Georgieff
County Administrator

A handwritten signature in dark ink, appearing to read "Ginger Welch".

Ginger Welch
Council Chair

cc: County Council ..

"A Consolidated City and County Government"

Responses to Comment Letter C071

- 1 Comment noted.
- 2 The Omega West Reactor, like the Power Burst Facility and the Oak Ridge Research Reactor, would have to be restarted for this project and thus does not have the capability to produce any Mo-99 immediately. All the alternatives would eventually allow the Department to produce greater than the 10%-30% U.S. demand. The purpose of the proposed action in the near term is to create a backup capability, not to create a primary source for Mo-99. Producing 10%-30% on a continual basis would provide some certainty that the alternative could meet production demands up to 100% of the U.S. demand if needed. Current companies that supply Mo-99 to hospitals throughout the U.S. are under contract with Nordion for their supplies. Because of these contractual issues, it is not certain that the Department could sell 50% of the demand immediately.

February 6, 1996

Mr. Wade Carroll
U. S. Department of Energy
Office of Isotope Production and Distribution (NE-70)
19901 Germantown Road
Germantown, MD 20874-1290

Dear Mr. Carroll:

I appreciate the opportunity to review the Draft *Medical Isotopes Production Projects Molybdenum-99 and Related Isotopes Environmental Impact Statement (DOE/EIS-0249D)* and to participate in the public meeting held January 30th in Albuquerque. Again I compliment you and your staff for the professional, businesslike, and patient manner in which the public meeting was conducted. DOE has gone out of its way to accommodate individuals whose comments were not focused on the contents of the EIS but rather broader attacks on the DOE.

1 In fact, the comments made by representatives of the Southwest Organizing Project (SWOP) and the Southwest Research and Information Center (SWRIC) raise the question in my mind. "What has DOE accomplished with this Draft EIS?" In my view, the answer in the technical realm is: nothing. The Draft EIS confirms the results of the earlier Environmental Assessment, the generation and processing of targets at Los Alamos National Laboratory, and Molybdenum-99 at Sandia National Laboratory (the DOE preferred alternative) pose no significant threat to either the workers or the public. Similarly, the effect in the "political" realm is also minimal. The Draft EIS does not give SWOP and SWRIC the answer they wanted, therefore, they conclude it is unacceptable as evidenced by their representative's "return" of the drafts. Furthermore, in my view, one of the approaches these groups take is disingenuous, at best. They argue that DOE should have private industry take over the isotope production role. But anyone with even minimal background in the nuclear safety arena knows exactly what would happen if a commercial entity did attempt to license a new reactor. Antinuclear groups, such as SWOP, would use every avenue available to thwart them, making the effort so economically difficult that it probably would be abandoned.

2 | During the public meeting, Dr. Karen Neuhauser presented some excellent arguments that I commend to DOE. In addition, I strongly second her recommendation that DOE reexamine its policy of "activist appeasement," as she termed it. My own experience suggests that once DOE "waffles," as I believe it did with respect to the earlier Environmental Assessment, it puts itself in a continuing "no win" situation. Each draft published that does not provide the answer sought by the activists leads to a call to "bring us another rock." The resources that have been expended to date on this "non-problem" (which I estimate to be in

Mr. Wade Carroll
February 6, 1996
Page 2

2 | excess of \$1 million) could much more profitably been spent to bring the project to fruition. An affirmative Record of Decision should be promulgated at the earliest possible date.

Although, as noted, I do not believe the EIS was needed, there are some minor points that if addressed may enhance its presentation.

- 3 |
- It is difficult to establish with any accuracy just how many persons are included in the estimates of population dose. The discussions in Chapter 5 seem at times to include every-one within an 80 kilometer radius. On the other hand, the results in section 5.15.1 (e.g., Tables 5-21, 5-23, 5-25, 5-27, and 5-28) appear to consider only some 133,266 persons within 80 kilometers to the "north." I've been unable to ascertain how this number was established. Interpretation of the results would be much easier if these populations were more precisely defined.
 - The tables in Chapter 5 frequently report results in mixed format. For example, an expected exposure is presented as 0.000089 rem, while the cancer risk is expressed in exponential notation as 4×10^{-6} . I strongly recommend that only the exponential notation be used.
 - In most instances the (impacts) exposures are reported in the tables in units of rem, while the narrative discussion that accompanies the table uses mrem. Obviously, either is correct and the conversion is a simple matter of 1000. However, given the extremely low values being reported, I think readability and comprehension would be enhanced if mrem were used throughout.
 - 4 | • In the Chapter 5 tables Fatal Cancers are reported as None, followed by the actual analytical estimate in parentheses. While I completely agree that the reasonable conclusion from the analysis is that there is no observable effect, it seems incongruous to state None and then quote a value. I recommend that the tables report the numerical results of the analyses and the associated narrative text draw the conclusion.
 - In Section 5.21 the narratives accompanying the tables and figures related to minority populations and low-income populations are difficult to follow. These should be examined for possible rewrite to improve clarity.

Mr. Wade Carroll
February 6, 1996
Page 3

I look forward to an early DOE decision in this matter.

Yours truly,

David M. Ericson, Jr., Ph.D.


Dr. David M. Ericson, Jr.
3517 Yosemite Drive, NE
Albuquerque, NM 87111
505/296-8802

Responses to Comment Letter C072

- 1 The Department decided to prepare an EIS based on the environmental assessment (EA) and comments received on the EA. The EIS was prepared in part to explore additional alternatives for meeting the purpose of and need for the proposed action.
- 2 Comment noted.
- 3 Population dose estimates for routine (i.e., relatively continuous) emissions from facilities consider the total population within 80 km of the facility, accounting for the fraction of time the wind blows toward each sector.

In the case of accidents, the wind was assumed to blow in one direction during the entire release, and the direction evaluated for the EIS was chosen to maximize the population dose. If the wind direction were assumed to change during the course of the accident, a larger population might be affected, but the quantities of radioactive materials to which those populations are exposed would be lower, resulting in a smaller total collective dose and a lower average dose to the downwind individuals. The analysis in the EIS chose a single wind direction in order to maximize the potential population dose for each accident, which is noted in the text and tables of Section 5.15.

- 4 The preferences expressed in the comment regarding presentation of numerical results are noted and have been implemented throughout the EIS as appropriate.

OFFICE MEMO

Subject:

COMMENTS on DOE/EIS-0249D

Time: 11:11 AM

Date: 2/7/96

As an interested citizen with recent experience in the preparation of DOE/EIS-0203-F, I attended the July 24, 1995 public scoping meeting on the Draft Environmental Impact Statement for the Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes. Because of a previous out-of-town conflict I was unable to attend the public comment meeting on January 17, 1996. Please consider the following as my comments on the DEIS:

1. At the scoping meeting, John Brasier of INEL (considered an expert on the Mo-99 process; see page A.1 of the DEIS) gave a discussion on the suitability of ATR. That discussion recognized that the Navy mission for ATR was not compatible with Mo-99 production. Neither Mr. Brasier nor anyone else at the scoping meeting suggested PBF as the most appropriate Mo-99 irradiation source at INEL. Therefore the preparers of the EIS are to be commended for identifying, on their own, this role for PBF.

2. At the scoping meeting, DOE made available DOE-NE-0111, its August 1994 strategy document for the production of Mo-99 and other isotopes. This document states that DOE completed a reevaluation of domestic reactors with a capability to produce Mo-99 (p.18), following the primary coolant leak in 1993 at the Omega West Reactor, DOE's original choice after the first evaluation. Based on information in the strategy document, PBF was not considered in this reevaluation, before ACRR was identified as the preferred alternative. Thus PBF has not been given adequate consideration so far in the selection process.

3. The details of the proposed action are subject to misinterpretation:

a. The near-term goal includes the capability to increase production to supply 100% of the US demand, should the Canadian source become unavailable (page v). The most obvious interruption is AECL's plans to shut down the source "near the end of the century" (p. iv). Early capability to meet the full demand therefore appears to be more important than partial supply at an earlier date.

b. The action should also define a period of performance, such as five years from the ROD (when the EIS has to be updated). Such a POP would then include 2-1/2 to 3 years of operation at full demand (or higher if the US demand is projected to grow during that period of time).

The various alternatives should be judged against an action that is better defined according to this comment.

4. The strategy document also states (p. 4-4) that DOE "will strongly encourage private sector involvement with the project at the earliest time in the project including the possibility of leasing the production facility to a private investor". However, the DEIS

- more -

4 indicates that privatization is beyond the scope of the EIS (p. iii). The basis for this scope limitation needs to be justified. In BNCT PBF already has a potential private mission. ACRR with a DOD primary mission will not attract private investment.

5 5. An additional disconnect between the strategy document and the EIS exists. Savoie and Singh 1994, referenced several times in the EIS (primarily in relation to purpose and need) is "An Independent Assessment of the DOE Plan to Establish a US Production Source for Mo-99". The plan, of which this document is an independent assessment, is not described nor referenced in the DEIS.

6 6. Just like the Navy mission at ATR, the standby defense mission for ACRR is not compatible with an assured, reliable Mo-99 supply in time of national emergency. The BNCT mission of PBF is compatible with simultaneous full (100% US demand) Mo-99 production.

7 7. The EIS correctly identifies the need to upgrade the PBF safety documentation to new requirements including those of DOE Orders 5480.22 and .23. This comment raises similar questions about ACRR:

a. To meet full Mo-99 production over a significant period of time, ACRR would require a new fuel type and increasing the power level from 2 MW to either 3 MW (Table 3-2) or 4 MW (p. 3.23). Although the strategy document mentions an upgraded safety analysis (p. 19), the DEIS does not explain whether the current safety documentation addresses the new fuel, the higher power level, and the DOE Order requirements. If it does not, the low cost estimate for documentation in Table 5-52 and any uncertainty advantage in schedule for ACRR over PBF must be challenged.

b. Significantly, ACRR is the only reactor of the four alternatives for which an SAR is not referenced in Section 5.23. If Massey and Coates 1995 is intended to serve that purpose, what DOE safety reviews has it undergone?

8 c. Even if ACRR is available in a year or less to provide a partial Mo-99 supply, it would have significant later unavailability during conversion to full production.

9 7. The EIS describes three core modifications for PBF (pp. 3.48 & 3.50) and indicates they have not been costed (p. 5.101) "which could add significantly to the overall preparation costs". The full Mo-99 production could be met by raising the PBF power level somewhat above the proposed 10 MW and doing only modification 1 (removal of the central experimental tube), which should be the simplest and cheapest to implement and analyze.

8. Another cost uncertainty for PBF (p. 5.101) is in hot cell preparation and operations. The hot cells at the Idaho Chemical Processing Plant should be used in the INEL alternative to reduce these uncertainties.

10 9. Also on p. 5.101, the INEL cost estimates are purported to suffer because of "limited resources available at INEL" to perform them. DOE must provide for the necessary time and resources at the alternate facilities in order to shield itself from criticism that the playing field is not level. Those resources should be adequate to include review of the FEIS (and its comment resolution) by INEL before the document is issued. The initiative must come from DOE-HQ because of the local perception that LMIT will not actively participate in the EIS process involving a preferred alternative for a sister company.

- more -

11 10. Finally on costs, Table 5-52 should be revised to indicate life-cycle costs for an action
structured similar to the suggestions in Comment 3 above. These life-cycle costs should be
used as one basis for the ROD.

12 11. The explanation of "fuel damage scenario" in the last paragraph on p. 5.42 is not clear.
Like ACRR, PBF is primarily a transient-mode reactor that shuts down when the entire core
heats up. Nevertheless individual fuel elements can overheat to melting due to channel
blockage, etc. Is ACRR really immune to similar scenarios?

13 12. While one cannot expect DOE EIS analyses to be done totally consistently from document
to document, some basic aspects ought to be consistent to allow a comparison of risks. The
public access location at the INEL has traditionally been on the highway between Idaho Falls
and Arco, which is about an order of magnitude further from PBF than the 1000 m used in
14 Tables 5-41 and 5-42. DOE-EIS-0203-F represented an effort to inject consistency in these
analyses between the various DOE sites. On facility accidents the Mo-99 EIS analysis should
be consistent to the greatest extent possible with the methodology outlined in Appendix F-5
of Volume 2 of the INEL EIS. Similar consistency between the two EIS's should be achieved
in the transportation analyses. The reasons for, and effects of, unresolved differences in
methodology should be explained. PNL is familiar with these methodologies because its
senior reviewers for the DEIS (p. 8.10) participated in the SNF/INEL EIS.

15 13. "High-activity low level" waste (p. 5.33) from Mo-99 production points out the difficulty
with DOE definitions of radioactive waste, i.e. by source rather than activity level. A better
description of the waste, including the fate of residual HEU, should be included in
appropriate places in the EIS, such as Appendix A. Such description (and associated cubic
meter, curie, and kw numbers) should be consistent throughout the EIS, especially among
Tables 3-1 & B-6 and p. 5.33.

Thank you for your willingness to consider my comments.

George A. Freund

George A. Freund
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Idaho Falls ID, 83404
Daytime Phone 208-522-5647

Responses to Comment Letter C073

1 The commentor is correct in stating that the Power Burst Facility (PBF) at the INEL had not been considered prior to the EIS. Part of the EIS process is to determine a reasonable range of alternatives. Through thorough analysis by the Department and the EIS technical team, the PBF was identified by the team as a reasonable alternative. The PBF has been given the same level of analysis and evaluation in the EIS as each of the other alternatives, including the preferred alternative.

2 To replace their single existing reactor, the Canadians plan to build two new reactors, each with the capability to produce 100% of the worldwide demand for Mo-99. They plan to have these two new reactors operating by the year 2000, so even if one were to shut down, there would be adequate backup production capability at that time.

In the near term, with a single reactor producing 100% of the U.S. demand (and about 85% of the world demand), if that reactor were to be shut down, it would result in a Mo-99 supply shortage. The potential for such a shortage is why the ability to produce even a fraction of the U.S. demand in the near term is considered important.

3 Since the Department's intent is to operate as a backup to the Canadian supplier and to phase out production as soon as adequate backup capability is available from other sources, it is not possible to accurately define exactly what the actual period of performance or production levels would be.

4 The EIS states that production of Mo-99 by private source in the long-term is beyond the scope of this EIS. The EIS also states that the Department encourages private sector production of Mo-99, and if the private sector begins reliably producing Mo-99 in the U.S., the Department will phase out its production. The Department has simply proposed to establish a production capability to act as a backup to the existing Canadian supplier. This near-term goal is the focus of the EIS. The intent is not to compete with Nordion.

Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis.

The Annular Core Research Reactor (ACRR) is a DOE, Office of Defense Programs, facility. The Office of Defense Programs has no current or foreseeable need for the ACRR. That Office has requested that, if the ACRR is selected for this mission, the capability of the reactor to perform defense experiments be retained in case of a national emergency. The possible diversion of the ACRR for defense use is highlighted in the EIS because, in an emergency, the ACRR is more likely than the other reactors considered in the EIS to be used for defense purposes. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration and to significantly diminish its potential for privatization.

5 The Department's National Isotope Strategy, DOE/NE-0111, has been referenced and briefly discussed in Section 2.0.

- 6 If the ACRR is chosen for the proposed project, its mission would change from defense programs to medical isotope production. It is possible that the ACRR, the preferred reactor for the proposed project, could be diverted to support defense missions in case of a national emergency. However, as stated above in response to comment 4, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.
- 7 The ACRR is operating under a DOE-approved 1981 SAR, which was the time of the last major modification to the facility. This SAR has been amended since its approval to account for minor changes to the facility. The ACRR safety documentation meeting the current DOE requirements (DOE Order 5480.23) has been submitted and is in the final DOE approval process. Although this SAR covers those aspects that would be required for initial Mo-99 production activities, it would need to be amended for full production capability. The current SAR addresses the cooling increase for the 4 MW upgrade and beyond (up to 8 MW), but does not address the fuel design changes to the extent that would be ultimately required. The calculations performed for the fuel and core design changes would need to be verified with in-reactor testing, and the SAR would have to be updated to address the characteristics of the new fuel and reactor core.

The main issue regarding cost and schedule uncertainty is vested in the quality of the schedule provided by the various facilities. Los Alamos National Laboratory and SNL/NM have detailed resource-loaded/logic-driven schedules; INEL and Oak Ridge cost and schedule information is based on individual task descriptions which are appropriate for the level of cost/schedule comparisons required for an EIS, but not for detailed scheduling and budgeting.

- 8 The ACRR would be unavailable for an estimated 2 to 3 months to allow for necessary reactor modifications to achieve 100% production.
- 9 As described in Section 3.3.4.9, more than one modification would be required to conduct medical isotope production at the PBF, even if the power level were raised above 10 MW. Besides modifying the central cavity, which is a significant modification, the reactor control system would need to be modified for a continued steady state, non-pulse mode. The transient rods would need to be removed and fixtures for target irradiation placed in the vacant locations. All material removed from the central cavity would require disposal, a legacy waste cost and man-hour/man-rem cost. Legacy disposal costs are involved in the transient rods and mechanisms. Cooling flow to the central cavity would need to be appropriately established along with the normal core cooling flow in lieu of the contained loop that currently exists. Flow balance valves for the central irradiation cavity would have to be designed and installed to assure that appropriate target cooling flow is established without flow-induced vibration of the targets occurring. The core would need to be redesigned to supply a hardened spectrum of neutrons to the central irradiation cavity. A thermal spectrum would cause uneven irradiations of the targets. Concentration of the power to the core center would be needed to establish the appropriate flux levels without needing to operate the reactor above 10 MW to make the facility competitive with the others regarding fuel utilization. The additional costs for these modifications have been obtained and are presented in Section 5.22.

The Test Area North (TAN) Annex was identified for use in the INEL alternative rather than the Idaho Chemical Processing Plant (ICPP) because the modification costs would be similar and because the TAN Annex provides a boundary environmental analysis in the EIS. This would not preclude use of the ICPP hot cells for Mo-99 production.

- 10 The level of information provided for cost estimates by INEL was considered appropriate for the purpose of an EIS. Although it is believed that the uncertainties associated with the INEL estimates are higher than those of other alternatives, the estimates have sufficient accuracy to demonstrate that costs for any of the alternatives is not a major discriminator and is not a basis to disqualify any of the alternatives from consideration within the EIS. Because INEL has not been identified as a preferred alternative for this proposed project in the past as the LANL and SNL/NM alternatives have or even as an alternative in the past as ORNL has, the amount of detail available in support of the proposed project at INEL is less, but what has been developed in support of this EIS is considered appropriate. Additional cost information has been obtained and included in Section 5.22 of the EIS, and cost and schedule information will continue to be developed for the Department's eventual decision on this proposed project. All alternative sites, including INEL and ORNL were provided funds by DOE to support the EIS preparation team. All sites actively participated in the development of the analyses and preparation of the document.
- 11 The costs for the modification of facilities and facility operations are presented in Table 5-1 and Table 5-52. An analysis of these costs and the projected revenues specific to this proposed project will be evaluated for each alternative as information for the Record of Decision process. Since each alternative proposes the use of existing facilities and the Department is already responsible for facility-related costs, such as facility decommissioning, an incremental cost analysis (rather than a life-cycle cost analysis) was considered appropriate information for the decision-making process for the proposed project.
- 12 The technical basis of the comment is substantially correct. The EIS attempted, to the extent possible, to utilize existing safety documentation and other analyses in developing accident scenarios that would represent the design basis accidents for facilities considered in the Medical Isotopes Production Project. However, the PBF safety analysis report (SAR) is outdated and does not contain sufficient information on radiological emissions associated with the design basis accidents evaluated in the document. Based on information contained in the PBF SAR, a coolant flow blockage in the core leading to overheating and fuel element damage was included as a credible design basis accident. This is similar to the type of accident evaluated for the Omega West Reactor (OWR) and for which a radionuclide release estimate was available. Therefore the OWR release estimate was used to evaluate a similar accident at the PBF and also at the Oak Ridge Research Reactor in the absence of more recent analyses specific to those facilities. The same releases were not assumed for the ACRR because the power level and core cooling system are substantially different from those of the other reactors, and a relatively recent analysis specific to that facility was available. The release estimates for all sites were combined with site- and facility-specific information (stack parameters, meteorology and location with respect to potential receptors) to estimate the consequences to workers and the public from these accidents.

In addition, the estimated radionuclide releases for fuel damage scenarios (from whatever cause) at OWR and ACRR were similar, and use of the OWR scenario to represent emissions from an accident at the PBF should bound the consequences of a design basis accident at that facility. Assuming a lower release or accident frequency based on the thermal characteristics of PBF fuel might result in a lower risk estimate; however, this would not likely change the conclusions reached in the EIS because the accident risk associated with operation of any of the facilities is low.

- 13 The access point assumed for the PBF facilities is actually a thermal luminescent dosimetry (TLD) monitoring station at the area boundary. In the absence of more detailed information, it was assumed for purposes of the analysis that a member of the public could gain access to this location. The analyses

presented in the EIS for consequences at the public access location following accidents at the PBF are therefore more conservative (i.e., estimate a higher dose) than if the highway location were chosen. However, this would not likely change the conclusions reached in the EIS because the accident risk associated with operation of any of the facilities is low.

- 14 The Spent Nuclear Fuel Programmatic Environmental Impact Statement (SNF PEIS) (DOE 1995b) evaluated very different facilities and transportation scenarios from those considered in this document. For purposes of this EIS, it would be more important to maintain consistency in analyses among the alternatives in order to identify any significant differences among them. To the extent possible, the site-specific information used in this EIS was obtained from the sites or from their published reports, and each site had the opportunity to review the EIS before it was issued as a draft. Specific differences in methodology and assumptions referred to in the comment were not provided, and therefore cannot be addressed individually. However, they would be unlikely to change the overall conclusions in the EIS relative to the environmental risks associated with medical isotope production.
- 15 Section 5.14 describes the quantities, characteristics and components of waste generated by the medical isotope production process (see Table 5-18 and Table 5-19). The fate of highly enriched uranium remaining in the target fabrication process stream is also discussed in this section. Highly enriched uranium may be recycled using a process developed by DOE, or it may be disposed of along with the other process wastes. Inclusion of highly enriched uranium in the solidified process waste is not expected to substantially change the volume or methods by which the waste would be disposed of. The waste quantities reported in the EIS summary tables (Table S-2 and Table 3-1) represent the total quantity of what would be generated by all activities associated with medical isotope production. The 49 m³ per year of low-level radioactive waste reported in these tables for SNL/NM represents the total from target fabrication (7 m³ per year, Section 5.14.1.1) and target processing (42 m³ per year, Section 5.14.1.1). The waste activity levels listed in Table B-6 are those assumed for shipping packages that would be transported to onsite or offsite waste disposal facilities and do not necessarily correspond to the waste activities per drum reported in Section 5.14.



LAND AND WATER FUND

Legal Aid For The Environment

February 15, 1996

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Re: Draft Environmental Impact Statement Concerning
Proposed Medical Isotopes Production Project

Dear Mr. Carroll:

The Southwest Organizing Project ("SWOP") and the Land and Water Fund of the Rockies ("LAW Fund") write concerning a proposal by the Department of Energy ("DOE") to develop medical isotopes at Sandia National Laboratories/New Mexico ("SNL/NM") and Los Alamos National Laboratory ("LANL") and to distribute those isotopes to private parties throughout the United States (the "proposal" or "project"). While the isotopes involved are very important to modern medical procedures in the U.S., DOE's proposal involves the first significant expenditure of public monies, over \$60 million per year within the next few years, for their production and distribution.

DOE has prepared a draft Environmental Impact Statement ("DEIS") concerning the proposal, dated December, 1995. DOE has asked for comments on the DEIS, and we have exchanged correspondence concerning the date we should submit those comments to you. We received a letter from you on February 9 indicating that we should provide you comments as soon as possible, and based upon that letter, we have done our utmost to expedite the process in getting these comments to you. We hope that these comments will prove helpful and that DOE will proceed cautiously in light of the substance of these and other comments provided during this period. Based upon a review of the information available, we believe that the DEIS is inadequate, in clear disregard of the letter and spirit of federal law.

2260 Baseline Road • Suite 200 • Boulder, Colorado 80302 • (303) 444-1168 • FAX (303) 786-8054
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I. Introduction

DOE has been pursuing aggressively its proposal to develop and distribute medical isotopes. During that time, SWOP and the LAW Fund have participated at every available opportunity. We have provided several comments and suggestions concerning the proposal and how DOE might proceed in a sound manner. To date, DOE has failed to respond appropriately.

Approximately one year ago, DOE attempted to bulldoze the proposal past all concerned parties in an Environmental Assessment ("EA"), despite the project's many significant impacts upon the environment. SWOP and the LAW Fund provided substantial comments concerning that effort, in the hopes that DOE personnel would address the issues involved in this proposal.

DOE then began to prepare an EIS and invited comments on the appropriate "scope" for that review. Again, SWOP and the LAW Fund provided extensive input. We suggested, for example, that DOE greatly improve its outreach to affected communities, particularly to affected communities of color and low-income communities. We also suggested that DOE could learn a great deal from the EA process the agency had spent time and taxpayer dollars pursuing. Unfortunately, DOE has failed to consider our counsel.

Because DOE has not incorporated our previous suggestions into the DEIS, many of the comments herein are destined to repeat the concerns we have identified previously. In fact, we believe we have been forced to repeat our concerns far too often, and it is our hope that DOE will take those concerns seriously at this stage in the process. We herein incorporate by reference our April 28, 1995 comments concerning the EA submitted to Kathleen Carlson ("SWOP/LAW Fund EA Comments") and the comments concerning the scoping process of Dan Moore, Michael Guerrero, and Everett Delano in Albuquerque, New Mexico on July 31, 1995 ("SWOP & LAW Fund Scoping Comments"). We urge you to review those comments before DOE proceeds.

The comments below identify several critical areas: (1) DOE is attempting to segment this project and its impacts; (2) DOE has failed to consider and address reasonable alternatives to the project; (3) DOE has failed to address several foreseeable impacts associated with the proposal; and, (4) DOE continues to ignore mandated requirements concerning Environmental Justice.¹

¹ Additionally, DOE has failed to comply with mandated requirements for public participation. DOE is required to ensure

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II. The DEIS Illegally Segments the Proposal From Other DOE Actions and Related Impacts

6 | The National Environmental Policy Act, 42 U.S.C. section 4321 et seq. ("NEPA"), requires that "[p]roposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement." 40 C.F.R. section 1502.4(a). DOE has isolated the effects of this proposal, as discussed in more detail below, such that the DEIS fails almost entirely to consider the substantial issues of waste management and minimization that should be associated with such a significant project. The almost full-time operation of the nuclear reactor at SNL/NM will produce significantly more waste, hazardous and radioactive, than has been produced at the facility previously.

Despite this situation, DOE has segregated issues of waste management and waste transportation, as if production of medical isotopes is somehow divorced from the handling of that production's byproducts. DOE acknowledges at least three different environmental reviews related to various aspects of waste management and transportation, DEIS at 1.4, yet it fails to consider how decisions in those areas relate to or could affect a decision on the proposal at hand.

III. The DEIS Fails to Provide For Considerations of Several Reasonable Alternatives

An agency's analysis of alternatives is supposed to be the heart of an EIS. 40 C.F.R. section 1502.14. Among other things, agencies are required to do the following:

- (a) rigorously explore and objectively evaluate all reasonable alternatives;
- (b) devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits; and,
- (c) include reasonable alternatives not within the

5 | an open and adequate consideration of the issues involved in the proposal. See e.g., 40 C.F.R. section 1503.1(a)(4). Essential under this scheme is an aggressive effort to involve affected individuals and communities in early and substantive discussions. These requirements are discussed in the SWOP/LAW Fund EA letter, as are additional requirements imposed by Executive Order 12898. Unfortunately, DOE has failed to involve affected stakeholders, proceeding instead to pursue minimal and inadequate public involvement.

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jurisdiction of the lead agency.

Id.

7 The Alternatives Analysis in the DEIS addresses two basic scenarios: "no action" and production at an existing DOE facility. The DEIS dismisses the "no action" alternative, discussing uncertainties associated with the private, and possibly foreign, production and distribution of medical isotopes. It continues by addressing four different options for large-scale (30% or more of the entire U.S. demand) DOE production: (1) the proposal at SNL/NM and LANL; (2) production at the Omega West Reactor at LANL; (3) production at Oak Ridge National Laboratory; and, (4) production at Idaho National Engineering Laboratory. Clearly, these are not the only reasonable alternatives.

8 The DEIS discusses briefly, but does not analyze, three additional scenarios: (1) production at other federal facilities; (2) production at university reactors in the U.S.; and, (3) public/private production options. Its analysis fails to account for DOE's own report of August of 1994, the National Isotope Strategy, which established a preference for private production or a joint public/private venture to produce and distribute medical isotopes. Indeed, this strategy is consistent with efforts at other levels of the federal government to avoid "corporate welfare."

9 Nevertheless, DOE has failed to follow through on this strategy by providing the analysis in the DEIS necessary to give such ventures their appropriate consideration. For example, the DEIS mentions one proposal from Isotopes U.S.A., "a not-for-profit corporation dedicated to education, research, and other scientific purposes relevant to the production and use of stable and radioactive isotopes." DEIS at 3.62. Contrary to NEPA's clear requirements, the DEIS fails to analyze this alternative, dismissing it as a "management, not a production concept." Id. It should be quite clear to those considering medical isotope availability that management concepts and issues are important and necessary considerations.

Similarly, the DEIS, although mentioning possible advantages associated with alternative production methods and alternative producers (such as in the critical area of radioactive waste minimization), fails to analyze those approaches. For example, the DEIS fails to analyze any of the following reasonable alternatives:

- DOE and/or other agency assistance to proceed with development of the Medical Isotope Production Reactor;

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- DOE and/or other agency assistance to proceed with development of small linear reactors to produce Tc-99m;
- DOE and/or other agency assistance to proceed with construction and commissioning of additional reactors in Canada;
- DOE and/or other agency assistance to proceed with development of backup supply availability from Nordion's acquisition of assets of the Institut National des Radio-elements ("IRE");
- DOE and/or other agency assistance to proceed with Federal Drug Administration ("FDA") approval of direct IRE supplies to U.S. markets;
- DOE and/or other agency assistance to proceed with assurance and/or development of sufficient transportation arrangements for shipments from IRE;
- DOE and/or other agency assistance to proceed with development of several sources of supply such that no one source should ever involve 100% of U.S. market need;
- DOE and/or other agency assistance to proceed with FDA approval of supplies from Mallinckrodt Medical; and,
- DOE and/or other agency assistance to proceed with development of backup supply availability from European production sources.

Each of these reasonable alternatives should have been considered, though some may be outside DOE's jurisdiction. 40 C.F.R. section 1502.14(c). The DEIS fails entirely to give the sort of reasoned analysis necessary for an informed decision.

IV. The DEIS Fails to Discuss Several Possible and Likely Effects of the Proposed Project

NEPA requires agencies to discuss the following:

the environmental impacts of the alternatives including the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented.

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Id. section 1502.16. That discussion must include, among other things:

- (a) Direct effects and their significance;
- (b) Indirect effects and their significance;
- (c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned; and,
- (d) The environmental effects of alternatives including the proposed action.

Id. Effects, used synonymously with "impacts," are defined to include: "ecological ..., aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative." Id. section 1508.8.

A practical consideration of DOE's proposal should entail, at a minimum, a discussion of several prominent environmental effects. A review of the records at past DOE operations and at other nuclear reactors would indicate that this is a reasonable place to begin an analysis of environmental consequences. Unfortunately, the DEIS addresses these and other effects in a cursory and incomplete manner, or it fails to address them at all.

Several effects are likely from the generation, storage, transport, and disposal of significant levels and kinds of waste. These wastes include "high-level" radioactive waste (spent nuclear fuel), liquid "low-level" radioactive waste, solid "low-level" radioactive waste, and "incidental mixed waste." The proposal would entail a significant increase in the generation of the most hazardous of these wastes, spent nuclear fuel. The DEIS, however, fails to consider the impacts associated with the storage of such wastes, dismissing such issues by asserting that significant additional storage capacity could be created on-site at SNL/NM and by asserting that decisions about the ultimate disposal of these wastes will be made through a different DOE NEPA process. See Section II above.

Again, the DEIS has failed to address the issues raised by several commentators during the EA process. These comments raised a number of effects the DEA failed to discuss, and many of the same effects were neglected in the DEIS. DOE should consider, among others, comments submitted during the EA process of the following parties: Letter to Kathy Carlson, DOE, from Dr. Gedi Cibas, New Mexico Environment Department (April 20, 1995); Letter to Kathy Carlson, DOE, from Dr. Gedi Cibas, New Mexico Environment Department (March 17, 1995) ("NMED letter I"); and, Letter to Kathy Carlson, DOE, from James N. Paglieri (March 6,

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1995). These letters are incorporated herein by reference.

Furthermore, the DEIS tries to dance over an alarming aspect of the proposal -- DOE may not be able to sell the medical isotopes it produces and will be forced to dispose of those isotopes as waste. In other words, DOE will be spending significant taxpayer monies and generating significantly more waste in order to produce isotopes that will themselves be treated as radioactive waste! The DEIS avoids this unpleasant detail, and its consummate effects upon the human environment, treating the prospect as if it were an inevitable aspect of government doing business in the private marketplace.

Additionally, the DEIS fails to address and consider the economic effects of the project. For example, the DEIS contains two, remarkably different tables projecting cost estimates, Cf. DEIS at 5.4, Table 5-1 & Id. at 5.100, Table 5-52, with no substantive discussion of their relation to each other. The DEIS provides no discussion of the effects that these heavy expenditures, \$226 million in four years (according to Table 5-1), are likely to have upon the private production of medical isotopes.² It also fails to consider how these expenditures may affect future costs associated with waste management and disposal for private parties.

The DEIS fails to consider many other reasonably foreseeable effects, including the following:

- effects related to current restrictions at the Nevada Test Site concerning the disposal of non-defense-related low-level radioactive waste, including effects associated with possible changes in operations and procedures at one or more DOE sites, see e.g., Memorandum from George K. Lasker, DOE, Albuquerque Operations Office to Marilyn S. Bange (January 25, 1995) (appended hereto as Attachment 1) ("The most recent projections indicate that the [low-level radioactive waste] generated from the [isotope project] will range from 72 to 127 drums per year, which likely will exceed the total annual volume of [low-level radioactive waste] generated at SNL/NM") (emphasis added);
- effects associated with a lack of federal EPA standards for radiation exposure to members of the public as a result of

² This failure relates to the DEIS's failure to consider several reasonable alternatives, since alternatives involving private producers or joint ventures would have very different economic effects.

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the storage and management of spent nuclear fuel at many DOE sites, including SNL/NM, see 40 C.F.R. part 191;

- cumulative effects associated with the generation, handling, storage, transportation, and disposal of radioactive, hazardous and non-hazardous wastes at SNL/NM and LANL;
- effects associated with the use of highly enriched uranium ("HEU") in the Annular Core Research Reactor at SNL/NM (Table 5-19 discusses wastes associated with spent nuclear fuel assuming the use of low-enriched uranium ("LEU"), DEIS at 5.40, yet the proposal involves the use of 170 HEU beryllium oxide fuel elements, Id. at 3.16);
- effects associated with DOE's past difficulties in waste storage and management, including several past citations for violations of hazardous waste storage and handling requirements at SNL/NM and LANL;
- predictable effects, instead of reliance upon projections and modeling, related to similar operations at other facilities, including the Cintichem facility which has provided the license to DOE for its current proposal and which has had problematic past incidents and accidents, see SWOP/LAW Fund EA letter at 8;
- effects associated with the storage and handling of Uranium-235 at LANL;
- effects associated with emissions to air from the management and storage of wastes;
- effects associated with emissions to water (the DEIS dismisses any possibility of such releases, DEIS at 5.12, 5.23 & 5.44), despite the release of 30,000 gallons of contaminated effluent into a local drinking water supply from the Cintichem facility during its operation as a producer of medical isotopes, see our EA letter at 8, and the release of cooling water spills and other spills at several DOE facilities, see NMED letter I at 3;
- effects associated with water use downstream from SNL/NM, including effects upon members of the Isleta Pueblo and restrictions imposed by the City of Albuquerque, see 40 C.F.R. section 1502.16(c);
- cumulative effects upon particular populations, such as exposed workers who also live nearby and eat locally grown produce;

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- effects unrelated to cancer, such as immediate deaths, short-term health effects such as nausea or loss of appetite, and long-term effects such as genetic harms (the DEIS dismisses consideration of non-cancer effects because, it claims, many of these "would occur at lower rates" than cancer, DEIS at 5.7), despite the fact that these and other effects are very germane to human health and the environment;
- cumulative effects associated with operations, accidents, transportation, waste management and storage, air quality, and other factors (the DEIS inadequately discusses "cumulative impacts," merely summarizing the discussion from five previous sections, DEIS at 5.73-5.79);
- cumulative effects to workers and others from past exposures from DOE activities and from exposures to other sources, despite the fact that the project will involve a ten-fold increase in radiation doses to workers, DEIS at 5.74; and,
- predictable effects, instead of reliance upon projections and modeling, associated with current rates of transportation accidents and incidents from similar operations and from available information concerning New Mexico highways.

V. The DEIS Fails Entirely to Address Considerations of Environmental Justice At All Levels

We are perplexed by the DEIS's trite dismissal of Environmental Justice considerations. We believe that our repeated admonitions to DOE on the subject have been ignored entirely. DOE's utter failure to be guided by its own materials and by the materials of other agencies strains credulity.

We have segregated discussion of Environmental Justice in these comments because it is an essential element of the NEPA process and because to do otherwise would have meant that we were discussing such issues within the context of each of our other comments. Environmental Justice considerations are necessarily a part of each element of the EIS analysis. NEPA and Executive Order 12898 are clear in this regard -- whether the agency is considering alternatives, impacts, or other aspects of a proposal, it must address their relationships to communities of color and low-income communities. DOE should not segregate its consideration of Environmental Justice.

We have discussed previously how DOE's own guidance, U.S. DOE Environmental Justice Strategy (April, 1995) and U.S. DOE Effective Public Participation under [NEPA] (December, 1994),

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describe several practical steps DOE must take in implementing federal law. See SWOP/LAW Fund EA letter and SWOP & LAW Fund Scoping Comments. These and other available materials should prove adequate to assist the preparers of the EIS, and there are certainly DOE and other personnel available to assist.

24 | While we have identified numerous inadequacies in the DEIS, perhaps none are as stark as its utter disregard of Environmental Justice considerations. All of the issues discussed above should have been analyzed in the context of such considerations. The DEIS's circular maps, DEIS at 5.82-5.99, are useless. For no
25 | other environmental considerations has DOE relied upon an arbitrary "zone" taken entirely out of context of such relevant factors as land use, human behavior, possible exposure routes, and susceptibility.

Among other things, the DEIS failed to address the following:

- 26 | • communities of color are significantly more likely to live in "hot spots," locations with greater possibilities for harmful exposure, despite several studies demonstrating this situation;
- workers of color are significantly more likely to be exposed to harmful substances (DOE's own report of June, 1981 revealed this potential for workers at SNL/NH);
- 27 | • transportation impacts from the proposal are more likely to affect the several Native American Pueblos along the transportation routes (the DEIS dismisses these considerations, claiming that its previous analysis had revealed no significant affects associated with transportation, yet it fails to consider how Pueblo residents might be affected in ways different from other populations);
- disproportionate effects associated with the disposal of wastes upon Native American lands and communities;
- 28 | • disproportionate effects experienced by certain communities of color upon nearby lands and crops; and,
- disproportionate effects associated with limited access by many people of color to procedures involving medical isotopes.

VI. Conclusion

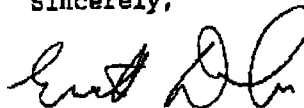
We have identified numerous inadequacies in the DEIS. We

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urge DOE to proceed cautiously and to comply with the letter and the spirit of NEPA. In doing so, the true effects of the medical isotope project should be clearly defined.

Thank you for your consideration of these comments. Please call us at the numbers listed below if you wish to discuss them.

Sincerely,



Everett Delano
Land and Water Fund
(619) 299-4484



Michael Guerrero
Southwest Organizing Project
(505) 247-8832

Enclosure

United States Government

Department of Energy

memorandumAlbuquerque Operations Office
Kirtland Area Office

JAN 23 1995

KAO:ESHCB:TPP

REPLY TO

ATTN OR

SUBJECT:

Request for Exemption to Dispose of Non-Defense, Low-Level Waste at Nevada
Test Site

TO:

Marilyn S. Bange, WMD, AL

On June 3, 1994, a memorandum was transmitted to you requesting an exemption to dispose of non-defense, low-level waste (LLW) at the Nevada Test Site (NTS). This exemption was requested due the new non-defense isotope Production Program (IPP) being pursued by Sandia National Laboratories, New Mexico (SNL/NM) for the production of radiopharmaceuticals. Subsequently, your office forwarded this request to DOE/HQ, and in response the attached September 29, 1994, memorandum was received from Jill E. Lytle, EM-351.

The attached letter states, "...the Sandia National Laboratories, and all other AL sites, will continue to be designated as defense waste generators for the purpose of disposing LLW at the NTS, as long as the amount of non-defense generated LLW is small in relation to the site's total LLW generation." Subsequent discussions with your staff indicated that as long as SNL/NM did not exceed 50% generation of non-defense LLW with respect to the total amount of LLW generated at the site, SNL/NM would be allowed to ship IPP LLW to NTS for disposal.

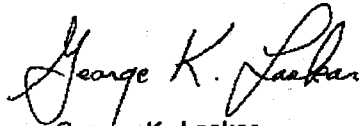
The most recent projections indicate that the LLW generated from the IPP will range from 72 to 127 drums per year, which likely will exceed the total annual volume of LLW generated at SNL/NM, except possibly during a few years of significant ER and D&D field work. There are many variables in SNL/NM's future LLW projections, such as the funding rate for ER cleanup and the percent of national medical isotope requirements to be supplied by SNL/NM, that prevent assurance that the 50% requirement can be met every year.

Due to the high visibility and priority of the IPP, it is crucial that assurances be made that LLW generated by this program have the NTS as a certain disposal option, or that other federal or commercial options be secured. Hence, I am requesting further assurance from your office and/or DOE/HQ to be certain that the LLW resulting from the IPP can be appropriately managed.

Marilyn S. Bange

2

Any assistance you can provide in resolution of this issue is appreciated. If you have any questions or require additional information, please contact Ted Pietrok of my staff at 505-845-5649.



George K. Laskar
Assistant Area Manager
Environment, Safety, and Health

Attachment

cc w/attachment:

T. Wallace, KAO

J. Retelle, KAO

J. Orban, WMD

M. McDonald, MS 1143, SNL/NM

T. Blejwas, MS 1315,

J. Guth, MS 1303, SNL/NM

E. Conway, MS 1310, SNL/NM

M. Lucas, MS 1303, SNL/NM

R. Seylar, MS 1303, SNL/NM

Responses to Comment Letter C074

- 1 As shown in Section 5.22 of the EIS, the estimated costs to prepare the facilities at the alternative sites for medical isotope production range from about \$17 million to \$21 million. Annual operating costs of the alternatives range from about \$8 million to \$13 million, but could be offset by revenues from isotope sales.
- 2 If a project does not clearly require an EIS but cannot be categorically excluded from further NEPA review, an environmental assessment is prepared. DOE's approach for the environmental assessment gave all interested parties a chance to review the proposed action and its impacts before it was approved. This approach is used to help the agency determine whether a project is significant enough in its scope and potential impacts to warrant the preparation of an EIS. In this instance, the Department responded to the results of the environmental assessment and to the public's comments and decided to prepare an EIS.
- 3 NEPA regulations require that public input be solicited at two points during the EIS process. Specifically, the Department is required to hold at least one scoping meeting before preparing the Draft EIS and one hearing to obtain public comment on the draft. Throughout the EIS process for the proposed Medical Isotopes Production Project, the Department has maintained an open channel of communication with members of potentially affected groups and other interested parties. The Public Participation and Outreach section (Section 1.4) highlights the range of outreach efforts in which the Department's project representatives have engaged to ensure that a full exchange of information has been achieved with the public. The Department held eight scoping meetings and eight public hearings. In addition, the Department has held numerous informal meetings and conference calls with the most interested stakeholders. A one-on-one meeting and a conference call were held with representatives of the SouthWest Organizing Project (SWOP) prior to the Department's decision to proceed with an EIS. SWOP representatives were also invited to an informal meeting following the release of the Draft EIS. The Department believes that it has allowed stakeholders ample opportunity to participate in the NEPA process.
- 4 Comments on the environmental assessment were considered in determining whether to prepare an EIS or issue a Finding of No Significant Impact (FONSI). The comments received during the scoping period were incorporated and responded to in the Implementation Plan and were reflected in the scope and content of the Draft EIS.
- 5 See response to comment C074-3 above.
- 6 Section 5 of the EIS discusses the potential impacts of the operation of the facilities during the proposed Medical Isotopes Production Project. Current resource use and waste generation were identified and compared with anticipated resource use (see Section 5.13) and waste generation (see Section 5.14). Potential impacts from this use and generation were then identified.

The potential impacts of the transportation of wastes are evaluated in Section 5.11. The EIS includes all aspects of the proposed program as well as potential cumulative impacts. Section 1 of the EIS identifies programs and proposed actions that are related to but not dependent upon the proposed action of the EIS. Changes in the proposed actions described in the related NEPA documentation section might require a modification to the proposed action in the EIS (for example, see discussion of waste management practices, in Section 3.3.4.8). If the modification required had not been anticipated and included in this EIS, supplemental analysis might be required.

- 7 The Department considered a full range of alternatives to meet the stated purpose and need. During the scoping process, public input was received to assist the Department in identifying a reasonable range of alternatives. Proposed alternatives were presented at the public meetings. Based upon public input and a diligent search and analysis, the Department revised the range of reasonable alternatives it analyzed in the EIS.
- 8 The three scenarios listed were subjected to a preliminary analysis and were found to be unable to meet the purpose of and need for the proposed project. Therefore, these alternatives were considered but eliminated from detailed analysis for the reasons identified in Section 3.4 of the EIS.

The Department would prefer that the private sector assume responsibility for ensuring that a reliable supply of Mo-99 is available to the U.S. medical community; however, private industry has thus far been unwilling to do so. Therefore, DOE has proposed to conduct the Medical Isotopes Production Project. If private industry is able to ensure a reliable supply of Mo-99 on its own, the Department could phase out its production activities.

Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The National Isotope Strategy states that DOE would consider privatization of its facilities if, by such an action, isotope production and delivery would be enhanced. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis.

- 9 The process by which DOE determined the alternatives to be analyzed in detail is discussed above. DOE's position on involvement of the private sector is also discussed in the above response and in Section 2.1.

DOE did not regard the concepts of the Medical Isotope Production Reactor and small linear accelerators as capable of addressing the near-term vulnerability of Mo-99 supply. Nor did DOE believe that issues related to the construction and commissioning of additional reactors in Canada and development of a backup supply through Nordion's acquisition of assets of the Institut National des Radio-Elements (IRE) to be in the purview of DOE or within the scope of this EIS. Furthermore, such alternatives would be further subsidizing a single source, and thus contrary to DOE's objectives.

Federal assistance for sufficient transportation arrangements for shipments from IRE is not necessary; sufficient transportation casks are available for the limited quantities IRE could supply (see Section 3.2.2).

The establishment of several sources of supply does not meet the facility needs set forth in Section 3.1. Since only a relatively small (4 to 10 MW) reactor is required to meet 100% of the U.S. demand for Mo-99 and DOE is proposing this action as a backup rather than the primary supply, the use of multiple facilities would introduce unnecessary infrastructure requirements and additional costs.

Mallinckrodt Medical does not need DOE assistance to obtain FDA approval of the isotopes they produce in the Netherlands. Even after Mallinckrodt obtained necessary approval, it would not have the capability to satisfy the U.S. need for a backup supply. The discussion in Section 3.2.2 of Mallinckrodt's Mo-99 production initiative has been updated.

DOE assistance with the development of backup supply from European production sources would not meet the purpose and need for the proposed action. As discussed in Section 3.2.2, foreign sources do not have the excess capacity to provide 100% of the U.S. demand for Mo-99 in a backup capacity.

- 10 DOE believes the EIS addresses all required and significant types of environmental impacts associated with the proposed Medical Isotopes Production Project. Adverse environmental impacts that cannot be avoided, the relationship between short-term uses of the environment and maintenance of long-term productivity, and irreversible or irretrievable commitment of resources are discussed in Sections 5.17 - 5.19 of the EIS. Direct, indirect (secondary), and cumulative impacts of the proposed action and each alternative are described in Sections 5.2 - 5.16, 5.21, and 5.22 of the EIS, including impacts on ecological, aesthetic, historic, cultural, and socio-economic resources, as well as land use and human health.

In keeping with its efforts to streamline the NEPA process and minimize costs, DOE has presented the various types of consequences at a level of detail appropriate to the potential magnitude of the impact. For example, more extensive analyses are presented for air quality, facility accidents, waste management, and transportation, which are the areas where impacts could occur. Historic experience with the DOE facilities involved, or with similar facilities, was used to the extent possible in estimating these impacts. Many other types of impacts, such as those on land use, aesthetic resources, historic resources, and ecological resources, would be minimal to nonexistent because all alternatives propose to use existing facilities with relatively minor modification. Consequences to these resources are described in less detail because of their relatively lower potential for significance.

- 11 Storage and disposal of wastes and spent nuclear fuel from the proposed EIS alternatives have been or will be addressed by other NEPA documents such as those for the proposed waste disposal facilities and DOE's programmatic EIS for management of spent nuclear fuel (SNF PEIS). The SNF PEIS was completed in 1995 in combination with the Waste Management PEIS (DOE 1995a); other potential waste storage sites such as the Nevada Test Site (NTS) and LANL are in the process of planning or preparing site-wide EIS documents that will address future waste management activities.

The quantities of either mixed waste, low-level radioactive waste, or spent fuel generated by the Medical Isotopes Production Project would be small compared to the total quantities of those materials managed at the receiving sites. For example, the quantities of low-level radioactive waste that would be generated under the alternatives in this EIS amount to 20-80 m³/yr, compared with the total volume of such waste managed at the potential receiving sites - 150,000 m³ at INEL, 220,000 m³ at LANL, and 460,000 m³ at NTS (DOE 1994b). Management of all radioactive wastes at the INEL was estimated to result in cumulative doses over a 10-year period of 1 to 8 mrem to a maximally exposed member of the public, and 4 to 35 person-rem to the population within 80 km of the site, depending on the options chosen for treatment and storage (DOE 1995j). Because it would require minimal additional treatment or packaging, the small incremental quantity of waste generated by the alternatives in this EIS would not be expected to increase the total impacts from radioactive waste management at any receiving location.

Generation of spent fuel by the proposed Medical Isotopes Production Project amounts to, at most, a few kilograms per year even at production levels sufficient to meet 100% of the U.S. demand for Mo-99. Immediately after removal from the reactor at the production site, spent nuclear fuel (SNF) would require temporary onsite storage because of heat generation in the fuel elements. The intent of the analysis in this EIS was not to imply that spent fuel would necessarily be left at these sites for an extended period, but to assure that the candidate isotope production sites could safely manage it during the onsite storage time. After suitable cooling period to provide for safer handling and transport, the spent fuel could be shipped offsite for storage in accordance with the 1995 Record of Decision for the SNF PEIS either at INEL or Savannah River (SRS). The timing and logistics of the transportation would be subject to arrangements between the shipping and receiving sites.

The consequences of transport and storage of spent fuel were evaluated in the SNF PEIS. The analysis in that document predicted no accidental or latent cancer fatalities resulting from all transportation of DOE-managed fuel in the preferred alternative (DOE 1995b, Volume 1, Appendix I). Storage of the fuel at either INEL or SRS would likewise be associated with very small doses to the public — less than 0.01 mrem/yr to the maximally exposed individual and less than 0.2 person-rem to the offsite population (DOE 1995b, Volume 1, Appendices B and C). Compared to the total quantities of SNF managed at DOE's designated regional management facilities, which amounts to several hundred metric tons, the kilogram quantities that would be generated under the proposed action would not substantially increase the risks at these sites.

- 12 Comments on the Environmental Assessment were considered in determining whether to prepare an EIS or issue a Finding of No Significant Impact (FONSI).
- 13 If the Department decides to pursue this project, it would only produce Mo-99 at full capacity in the event of a Mo-99 supply shortage. At all other times, it would operate under its normal backup mode and would only produce enough Mo-99 to maintain the capabilities of the facilities and staff to respond to a Mo-99 shortage.

In this backup mode, the Department would attempt to sell all of the Mo-99 and related isotopes (xenon-133 and iodine-131) that it produced. There may be times, however, when the Department would be unable to sell all of the isotopes and would have to dispose of them as waste. If Mo-99, iodine-131, and xenon-133 were disposed of as waste, they would not add substantially to the volume, activity, or cost of waste disposed. All are short-lived radionuclides that decay to nonradioactive or very low-activity isotopes, and could be incorporated into the normal process waste streams. The waste generation figures presented in Section 5.14 take into account the potential need to dispose of unsold isotopes. The EIS is forthcoming about this possibility, and the analyses of waste generation impacts in the EIS take this possibility fully into account.

- 14 Table 5-1 and Table 5-52 provide the same information in different formats required by the respective analyses. Because regional socioeconomic effects depend upon the rate of local spending and employment, as well as the total amount spent, Table 5-1 allocates the remaining total investment to complete the project (shown by facility, but not by year in Table 5-52) across the construction years discussed in the schedule for each alternative site. Annual operations expenditures and employment (shown in Table 5-52 by facility) are also shown (in Table 5-1) for those years in which they would occur if the facilities were operated to produce 100% of U.S. national demand for Mo-99. For some alternatives, construction and operations activities overlap in some years.

The commentor appears to have misread Table 5-1. In no alternative did the costs over 4 years reach \$226 million. In the table, the highest construction expenditure was \$21 million, the lowest \$17.2 million, consistent with Table 5-52. Annual operations costs range from \$12.8 million down to \$8.4 million. Expenditures during particular years are a mix of construction and operations costs, reflecting the special schedule conditions at each site: for example, operations labor would come on earlier with the SNL/NM alternative, and its 4 years of expenditures account for about 1 extra operating year.

DOE plans to sell the Mo-99 at prevailing world market prices; thus, the costs incurred may or may not be fully recovered, depending on the level of demand. Full recovery of operating costs is anticipated at about 30% to 40% of U.S. demand. In any case, the expenditures shown in Table 5-1 are not expected to adversely affect private production of medical isotopes. Private costs for waste management and disposal are not expected to be affected.

- 15 The NTS has issued a draft site-wide EIS which includes waste that would be generated from the Medical Isotopes Production Project. The Department believes that any uncertainty surrounding the NTS's ability to accept the waste from the proposed project is sufficiently small that there will not be an impact on the project.
- 16 Effects of DOE operations, including interim storage of SNF, are subject to the requirements of both EPA and DOE regulations. For example, fuel storage facilities would be required to demonstrate compliance with EPA regulations for atmospheric radionuclide releases in 40 CFR 61 and protection of groundwater in 40 CFR 141. DOE regulations in 10 CFR 835 and proposed 10 CFR 834 (expected to be finalized in 1996 and currently implemented as DOE orders) would govern radiation protection of workers, the public, and the environment. The regulation in 40 CFR 191 applies only to ultimate disposal of high-level radioactive waste and spent nuclear fuel, which is the subject of ongoing discussions between EPA, DOE, and the U.S. Nuclear Regulatory Commission.

Management of DOE's spent nuclear fuel over the next 40 years would be in accordance with the Record of Decision for DOE's programmatic EIS on spent nuclear fuel management (SNF PEIS). This decision designates regional storage and management facilities for different types of spent nuclear fuel, to be located at the INEL, the SRS, or the Hanford site. The programmatic EIS evaluated the impacts associated with spent fuel transportation to, and storage at, these regional facilities until the Federal agencies issue revised regulations and a decision is made regarding its ultimate disposition.

- Waste management activities are either included in Section 5 of the EIS or are covered by NEPA documentation for waste disposal facilities at the receiving sites. The cumulative impacts associated with waste management are not expected to exceed those discussed in Section 5.16 of the EIS. As indicated in that section, the quantities of wastes generated by the EIS alternatives are small compared to the total quantities of these materials managed by DOE at the receiving facilities.

- Management of spent nuclear fuel (discussed above) would apply equally to highly enriched uranium and low enriched uranium fuel. The quantities of spent fuel generated were based on use of low enriched uranium in the reactors because this estimate bounds the analysis; the quantities of spent fuel would be smaller than those presented in the EIS if highly enriched uranium were used.

- The cumulative effects of the EIS alternatives and past actions by DOE or others, to the extent that they have ongoing impacts, are considered in Section 5.16 of the EIS. Any future waste disposal activities would be subject to review and permitting by appropriate agencies and would be conducted in accordance with applicable Federal, state, and local regulations.

- Impacts of activities associated with the proposed alternatives are in large part based on past experience with the specific facilities considered at each site or on similar facilities, including the Cintichem facilities. The modeling conducted for the EIS accounts for these potential impacts using site-specific data appropriate to each location where the medical isotope project could be implemented.

- 17 A substantial amount of uranium-235 generated as a result of prior activities is currently in storage at LANL. Because of the nature of the target fabrication operations and the small quantities of material involved, fabrication of targets containing uranium-235 at LANL is not expected to result in environmental impacts that would be measurably greater than those now occurring from site operations. These impacts are described in Sections 4 and 5 of the EIS.
- 18 Management of radioactive waste at the alternative sites is bounded by the impacts evaluated for the processing facilities in this EIS or is included in NEPA documentation for the ultimate disposal facilities. Because the wastes would be solidified and packaged in sealed containers before removal from the processing facility, air emissions resulting from waste disposal activities would not be expected to contribute measurably to offsite consequences.

Releases of water by the Cintichem facility would not necessarily imply that such releases would occur, or would even be possible, at DOE production facilities because of the different design features of these facilities. For example, modifications to the Annular Core Research Reactor would provide containment of any potential overflow from the reactor cooling system. Other parts of the reactor cooling system, such as the cooling towers, are isolated from the reactor core cooling loop and would not be contaminated under normal conditions. Any accidental leakage between the systems that could result in environmental releases would have consequences substantially lower than the types of accidents evaluated in the EIS, as indicated by the minimal impacts associated with the liquid release accident at LANL (see Section 5.15.2.3). Liquid wastes would be solidified before disposal, which would take place in approved disposal facilities that meet applicable Federal, state, and local regulations. None of these systems would result in routine release of liquid effluents to the environment, other than normal sanitary wastes, and there would be no anticipated impacts on the Isleta Pueblo, the City of Albuquerque, or any other downstream population.

- 19 The maximum radiological impact to an individual who happens to be a DOE worker and a nearby resident would amount to the sum of the doses presented in the EIS for the offsite maximally exposed individual, and the maximum occupational dose to an individual worker. The maximum occupational dose to any DOE worker is limited by law to 5 rem/year. This limit is administratively controlled to lower levels, typically 500 mrem/year at many DOE sites including SNL/NM, although most workers receive much lower than the maximum dose. The dose from environmental exposure at a nearby residence would be less than 0.2 mrem/year for any alternative considered in the EIS.
- 20 The consequences of the actions proposed in the EIS would not be expected to result in any cancer fatalities as a result of radiation exposure or any other emissions to the environment, such as those from vehicles. If cancer fatalities would not be expected, neither would one expect to see genetic effects or other consequences that occur at lower rates for comparable levels of exposure. The intent of the EIS was

not to dismiss these other types of effects as insignificant, but to use the most prevalent type of effect — cancer fatalities — as an indicator of the level of consequences that might be expected. As the EIS analysis demonstrates, no observable health effects of any type would be anticipated from implementation of medical isotope production under any of the alternatives.

Short-term effects, such as acute deaths, nausea, or other indicators of high-level radiation exposure, would only be expected in the event of a severe accident and would likely only affect a small number of directly involved onsite workers at most. Environmental exposures resulting from routine operations, or from all but the most severe (and low probability) accidents, would not produce these types of affects in any member of the surrounding population. The maximum reasonably foreseeable accident directly involving an onsite worker might produce some observable short-term effects (such as temporary effects on blood cell counts or fertility), but the estimated exposure level would not be considered life-threatening.

Effects of current site operations, as well as any planned future activities at the alternative sites, are considered in the cumulative impacts section. The nature and consequences of these activities are indicated in the text of Section 5.16.

- 21 The cumulative impacts of radionuclide air emissions are discussed in Section 5.16 in terms of current and anticipated future operations at the alternative sites. The cumulative impacts of air emissions compared to past operations would depend on the types of activities that have historically been conducted at each site. For sites such as SNL/NM or LANL, where operations have typically been research-oriented, the proposed action may very well represent an increase in the recent collective doses to the offsite population as reported by the site. Cumulative doses to the population within 50 miles of LANL amount to about 13 person-rem from 1990-1994, and 0.6 person-rem at SNL/NM over the corresponding period.

For other sites, where the operations have been oriented toward strategic materials production, the cumulative historic doses would be expected to be much greater than those estimated for the EIS proposed actions. For example, cumulative offsite doses to the population surrounding the Oak Ridge Reservation, which historically has produced enriched uranium in addition to supporting a number of research missions, amounted to about 17,000 person-rem during the period from 1944 to 1987 (DOE 1988c). However, in recent years, many of the DOE defense materials production facilities have been shut down, and the missions at these sites have become oriented toward environmental restoration, which has dramatically reduced air emissions. Collective doses to the offsite population from 1990-1994 at the Oak Ridge Reservation amounted to 170 person-rem from a combination of defense materials reclamation activities (at a much reduced level) and research. At the INEL, where the historic spent fuel reprocessing mission has virtually ceased, the offsite doses are much lower — 0.47 person-rem over the same 5-year period. Air emissions from the medical isotope project would result in a relatively small increase (0.7-15%, depending on location) in the annual collective dose to the public from all DOE facilities, which was about 100 person-rem during 1994.

The pattern of cumulative occupational dose would likewise depend on the historic missions of the respective sites, and these too have been changing with the site missions. The annual occupational doses from the proposed Medical Isotopes Production Project would amount to a few percent of the 5-year cumulative doses to workers at LANL or INEL (about 1300 person-rem cumulative dose at each site from 1990 to 1994), whereas it would result in a proportionately larger increase in occupational dose at either

SNL/NM (5-year cumulative dose of about 100 person-rem) or ORNL (about 400 person-rem over the same period). As with the offsite cumulative doses, the occupational doses at former production sites have declined rapidly during recent years. For example, the historic doses to workers at the ORNL amount to about 19,000 person-rem over the 32-year period between 1943 and 1974 (National Research Council, BEIR 1990). The proposed project would also represent a small (less than 2%) increase in annual worker dose across the DOE complex, which amounted to about 1800 person-rem in 1994.

Collective doses to the public from air emissions at DOE facilities are taken from their annual air emission reports to the U.S. Environmental Protection Agency for calendar years 1990-1994.

Collective occupational doses at DOE facilities are taken from annual statistics submitted to DOE, which are summarized and published each year (see DOE/EH-0287T for CY-1990 and DOE/EH-0430 for CY-1991; more recent data are available from DOE's technical information service on the Internet).

- 22 The estimated consequences of transportation in the EIS are based on recent statistics concerning vehicle density, population density, and vehicle accident rates specific to the potentially affected routes, as well as on the relative severity of vehicle accidents. The models used to estimate accident impacts incorporate these data, along with information about the types and quantities of materials to be transported, in order to estimate the consequences of incident-free transportation and potential accidents.
- 23 There is no requirement in NEPA or Executive Order 12898 that each environmental impact element in an EIS include, in the context of the discussion of the element, an analysis of environmental justice considerations. DOE has consolidated such considerations in Section 5.21. Section 5.21 identifies and shows the location of minority and low-income populations relative to the alternative sites and considers the paths by which minority and low-income populations could experience disproportionately high and adverse impacts. No such impacts were identified in the course of normal operations of the proposed facilities. Accidental releases are discussed in Section 5.21. It was found that the impact on populations located in particular places depends on the direction of travel of any release, which cannot be known in advance. However, disproportionate impacts were discussed as a possibility if an accidental release occurred and if the wind were blowing in a particular direction. In several cases, depending on wind direction, the majority population is more likely to be affected.

Demographic and socioeconomic factors offer the possibility that subsistence resources are an extra possible pathway of contamination at some sites, especially for Native American populations. For this to occur, an environmental pathway from release, to subsistence resource, to human consumer must exist.

In the EIS, land use, human behavior, and possible exposure routes all were given consideration, along with direction and type of accidental airborne release. Because effects were small and uncertain for any population, however, detailed analysis of any particular sub-population for which potential impacts were even more uncertain was not performed. Differential susceptibility to effects, given exposure, was not considered because the possibility of disproportionate and adverse effects was itself considered so highly uncertain. Similarly, waterborne releases, which have a potentially different geographical pattern than airborne releases, were not considered likely enough or extensive enough even under accident scenarios to harm any offsite population.

- 24 Please see response to C074-23 above.

- 25 The practice of providing maps of the location of minority and low-income populations surrounding a proposed site as the beginning point for an analysis of environmental justice is accepted practice. The use of an 80-km zone for analysis of offsite effects of environmental releases and the use of "wind roses" to analyze the path of potential airborne releases for purposes of safety analysis and environmental analysis as it applies to offsite populations has been a standard practice of both DOE and the Nuclear Regulatory Commission for many years. Adding location of minority and low-income populations to these maps further specifies the geographic location of populations which are to be given special consideration in determining whether they face negative and disproportionate environmental impacts because of their location.
- 26 Consideration of the existing location of minority and low-income communities surrounding the four alternative sites considered in the EIS did not identify a potential for communities of color to be any more likely to be affected by environmental releases than communities composed of majority populations.

It is speculative and inappropriate to try to specify in advance which workers at the proposed facilities would be minority workers.

- 27 The comment states that "transportation impacts from the [proposed action at SNL/NM] are more likely to affect the several Native American Pueblos along the transportation routes," but provides no information to substantiate this assertion. DOE has not identified any mechanism by which Native Americans might be at higher risk than other members of the potentially affected population along the route. The relative risk of severe consequences following an accident would depend on a number of factors, including the length of the route that traverses the pueblos, the proximity of Native American populations to those routes, local meteorological conditions, and other circumstances of the accident. Because the consequences of transportation would not be expected to result in any health effects among the entire population at risk, no such consequences would be possible among Native Americans included in that population.
- 28 No waste disposal is planned on Native lands or communities. Before communities of color could experience disproportionate effects from this source, their lands and crops would have to be disproportionately affected or they would have to be disproportionately dependent on them. Section 5.21 allows for and admits such possibilities, but states that there is not enough known about the potential timing and direction of releases (which crops or lands would be affected) or ownership and dependency to state that communities of color would be adversely and disproportionately affected. Access to procedures involving medical isotopes is not an environmental effect of any of the alternatives and, thus, is outside the scope of this EIS.

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February 9, 1996

Mr. Wade Carroll
EIS Project Manager
Medical Isotopes Production Project (NE-70)
U.S. Department of Energy
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Subject: **STATE OF NEW MEXICO'S COMMENTS AND RECOMMENDATIONS ON THE
DRAFT EIS FOR THE MEDICAL ISOTOPES PRODUCTION PROJECT**

Dear Mr. Carroll:

Following are the comments of the State of New Mexico's Radioactive Waste Consultation Task Force (Task Force) on the draft Environmental Impact Statement for the Medical Isotopes Production Project, DOE/EIS-0249D, December 1995. These comments supplement our earlier comments of March 15, 1995, pertaining to the draft Environmental Assessment for the proposed project. The request for public comment was noticed in the Federal Register of December 22, 1995, Vol. 60, No. 246, p. 66542.

The Task Force, created by state statute in 1979, is composed of the Cabinet Secretaries of the Energy, Minerals and Natural Resources Department (EMNRD), Environment Department, Department of Health, Department of Public Safety, Taxation and Revenue Department, and the State Highway and Transportation Department. The EMNRD Cabinet Secretary currently chairs the Task Force. Included among its duties, the Task Force represents the Executive Branch of New Mexico State government in various areas relating to the management and disposition of high-level, transuranic, and low-level radioactive wastes. [Section 74-4A-7 New Mexico Statutes Annotated 1978] Hence, the Medical Isotope Production Project falls within the purview of the Task Force.

GENERAL COMMENTS

To begin, the State of New Mexico commends the U.S. Department of Energy (DOE) for its decision to prepare an Environmental Impact Statement (EIS) for the proposed Medical Isotopes Production Project. We believe the scope and potential effects of this project merit the more in-depth analyses inherent in the EIS process. And, even though the EIS process may have delayed commencement of the project, the resulting increase in public participation and input should significantly enhance the quality of the assessment. Hence, a more informed, extensive basis for issuance of a DOE Record of Decision on the project is anticipated. This is a particularly important consideration to the citizens and communities surrounding the alternative facilities being evaluated due to the project's nature (i.e., production, separation, and transport of radioactive isotopes) and corresponding implications.

1 | The State generally concurs in the DOE's selection of its preferred alternative. This alternative (Annular Core Research Reactor: Sandia National Laboratories/New Mexico in conjunction with the Chemistry and Metallurgy Research Facility: Los Alamos National Laboratory) appears to best meet the specific technical criteria established to satisfy the purpose of, and need for, the proposed action. In combination, the targeted facilities at Sandia National Laboratories/New Mexico (SNL) and Los Alamos National Laboratory (LANL) appear to offer several advantages over the other reasonable alternatives. These advantages include: 1) SNL's Annular Core Research Reactor is a currently operating (albeit "research") reactor, with qualified, experienced personnel readily available onsite to provide technical guidance and assistance on the project; 2) SNL is located in close proximity to Albuquerque International Airport, thereby minimizing potential transportation-related impacts; and 3) sufficient quantities of HEU (highly enriched uranium) feedstock already exist at LANL to support the project's full production requirements for several years.

2 | Another factor that weighed somewhat heavily in the State's concurrence in DOE's preferred alternative is the significantly lower estimated radiological dose to the so-called maximally exposed individual (MEI) from target irradiation activities at SNL. It is projected that this hypothetical offsite resident would receive a radiological dose of 0.00017 millirem per year--an order of magnitude below the alternative with the next lowest estimated annual dose. Although target irradiation activities associated with all of the reasonable alternatives had estimated MEI dose rates far below established regulatory limits, the preferred alternative (SNL) is clearly superior in comparison to the other facilities.

3 | In reviewing the draft EIS, we noted that the estimated annual MEI radiological dose rate from target processing at SNL was considerably higher than the LANL alternative. Upon closer inspection, however, it was determined that estimated air emissions from the SNL hot cell facility are based on historical emissions data from the Cintichem process. Because the ventilation system for the SNL hot cell must undergo a major upgrade if that site is selected for the project, the radiological consequences of actual air emissions would presumably be reduced as a result. If this is not the case, the State encourages DOE to comparatively evaluate even more closely the SNL and LANL alternatives--especially with respect to estimated cumulative air quality impacts on the public. The fact that SNL is situated within New Mexico's largest population center (Albuquerque) must be a primary consideration in the decision-making process for siting and configuring the Medical Isotope Production Project.

The State of New Mexico fully supports DOE's long-term goal regarding domestic production of Molybdenum-99 for the U.S. medical community: It should be conducted by the private sector. As you are well aware, one of the most controversial aspects of this project relates to its estimated substantial subsidy by the federal government. DOE's own cost estimates indicate that preparatory costs for the alternatives range from \$16.8 million to \$21.0 million, with operating costs expected to run between \$8.4 million and \$12.2 million a year. To most citizens, these are considered to be significant future expenditures of taxpayer

dollars. Consequently, we were pleased to see DOE's apparent commitment to privatization of DOE isotope activities in the form of a Notice for Expressions of Interest. This Notice was published in the *Federal Register* of December 11, 1995, Vol. 60, No. 237, p. 63515. It calls for innovative approaches to privatizing such DOE isotope activities as selling or leasing existing DOE facilities for commercial use; sale of existing isotope inventory; isotope marketing, distribution or technical services; and other possible arrangements for enhanced private-sector involvement in isotope operations. Issuance of the referenced Notice is an excellent first step toward privatization. Notwithstanding this initiative, if the Medical Isotope Production Project proceeds, the State urges DOE to move aggressively in facilitating its transfer to the private sector at the earliest available opportunity.

4 | A related issue that has raised some concern with the State of New Mexico pertains to various operational aspects surrounding implementation of the preferred alternative. Specifically, SNL has not in the past been called upon to produce and market radioactive isotopes. The EIS clearly states that this type of mission would be new to the SNL/NM facilities. Indeed, the SNL Annular Core Research Reactor has never functioned as a continuous production reactor. As with any new undertaking, the production of radioisotopes will require establishment of a broad spectrum of facility-specific operating procedures, safety protocols, training programs, and other measures designed to protect both occupational workers and the general public. Effective radioisotope marketing will be an equally challenging effort. Our point is this: It is incumbent upon DOE to proceed cautiously in this new endeavor; to take full advantage of private-sector experience and expertise; and to err on the side of conservatism in terms of project risk management.

5 | Finally, with respect to waste and spent nuclear fuel management, the State recognizes that varying quantities of both solid and liquid low-level radioactive wastes, as well as spent nuclear fuel, would be generated under each of the alternatives. We are confident these materials can be handled, processed, and transported safely at any of the DOE facilities under consideration, provided such activities receive priority attention and adequate resources. In particular, issues relating to on-site storage of spent nuclear fuel at SNL must be addressed carefully and thoroughly. Planning for the transportation of low-level radioactive waste offsite should also be comprehensive and detailed. Toward that end, we strongly encourage DOE to consult and coordinate closely with the State of New Mexico in the project's waste management and transportation activities.

SPECIFIC COMMENTS

The following comments are limited to those sections of the EIS relating to the SNL and LANL alternatives.

6 | p. 3.14, **Target Fabrication at SNL/NM:** This section states that the highly enriched uranium (HEU) needed for target fabrication at SNL would be transported from DOE facilities at either Portsmouth, Ohio,

6 or Oak Ridge, Tennessee. It is unclear why the uranium existing in various waste streams at LANL could not be extracted and then shipped to SNL if DOE determines that target fabrication should occur there. Irrespective of the source, the specific location where this HEU material would be stored at SNL is not provided. Please clarify.

7 p. 3.23, **Annular Core Research Reactor Modifications at SNL/NM:** It is noted that a replacement fuel would have to be installed in the ACRR so the present fuel would not become highly exposed by the Mo-99 production activities. However, the document does not provide any discussion of replacement fuel options, their sources, costs, or other considerations. The final EIS should explicitly address these issues.

8 p. 3.25, **Hot Cell Facility Modifications at SNL/NM:** Insufficient detailed information is contained in this section regarding the existing ventilation system and its proposed "major" upgrade. Because the ventilation system has a direct bearing on such important aspects of the project as operational efficiency and air emissions containment, a much more comprehensive discussion is warranted here.

9 p. 3.37-.38, **Waste and Spent Nuclear Fuel Management at LANL:** The draft EIS states that spent nuclear fuel (SNF) from the Omega West Reactor "...will be cooled for approximately six months and then transported to the onsite storage area." Please specify both here and in Table 5-19 in the final document the 6-month storage capacity at the OWR facility by number of fuel elements; and whether the "interim storage capacity" referenced in that table is the total capacity now existing (i.e., clarify how many elements are currently in storage and what remains for the SNF to be generated from the Medical Isotope Production Project). In addition, please identify precisely where the LANL "onsite storage area" is located. A relatively large-scale map of TA-54 may be appropriate for inclusion.

10 p. 3.38, **Required Modifications to the LANL Omega West Reactor:** Previous discussions in the EIS indicated the OWR was constructed in the mid-1950s and was operational for almost 40 years without a major incident. In December 1992, the reactor experienced an unplanned shutdown which led to the identification of a leak from the primary cooling system. Although this problem has been analyzed and plans are in process to avert future such occurrences, this event raises an important issue about the integrity and longevity of other reactor components. From the information provided in the draft EIS, it is difficult to determine the extent to which the OWR has been evaluated in terms of its remaining useful life. To what degree will the DOE 5480.23 Safety Analysis Report address this issue? Please provide more in-depth information on the planned assessment and its scope.

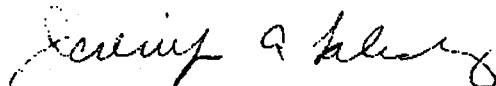
p. B.1, **Appendix B, Analysis of Transportation Impacts:** We want to express our appreciation to DOE for inclusion of this extremely comprehensive and useful appendix dedicated to potential transportation impacts associated with the project. Because the prospective air and truck transport of radioactive isotopes is the activity that will affect the greatest number of people, this

appendix goes a long way toward demonstrating the significant attention focused on this important issue. The State encourages DOE to give comparable priority to the environmental justice implications of its proposed transportation decisions in accordance with Presidential Executive Order 12898 and corresponding DOE directives.

In conclusion, the State of New Mexico acknowledges the precarious situation faced by the U.S. medical community should an interruption in existing Molybdenum-99 production occur. Total reliance on the sole Canadian producer of medical radioisotopes is not in the best interests of our Nation. We are pleased, therefore, that DOE is moving forward with a short-term solution to rectify this supply vulnerability. However, the State believes the conduct of this type of activity more appropriately belongs in the realm of the private sector. Consequently, DOE should proceed aggressively with its plans to privatize all isotope activities that make sense from an economic, efficiency, and safety perspective.

Thank you for the opportunity to present these comments on behalf of the Radioactive Waste Consultation Task Force and the State of New Mexico.

Sincerely,



JENNIFER A. SALISBURY
Cabinet Secretary and Chair
N.M. Radioactive Waste Consultation Task Force

c: Governor Gary E. Johnson
Task Force Member Agencies

Responses to Comment Letter C075

- 1 Comment noted.
- 2 The comment correctly notes that air emissions from target irradiation have lower consequences to an offsite member of the public at SNL/NM relative to the other sites. However, the total dose from target irradiation and processing at SNL/NM is comparable to that for the other alternatives. The dose to offsite individuals and workers is well within regulatory guidelines for all alternatives.
- 3 The estimated emissions from target processing at SNL/NM, INEL, and ORNL are based on historical emissions from the Cintichem facility during its final years of operation prior to 1989. At that time, the Cintichem facility employed emission controls to remove both particulates and iodine from its airborne effluents. The types of emission control systems that would be installed at SNL/NM, INEL, and ORNL would be expected to be similar to those used at Cintichem and would meet all applicable Federal, state and local standards.

The majority of radionuclide emissions from target processing consist of noble gases, which are unreactive and are not removed by either the particulate or iodine emission control systems. The only way to prevent noble gas emissions from these facilities is to hold up the gases that would normally be vented from the system long enough to permit decay of the shorter-lived radionuclides. A hold-up system has been proposed for the LANL alternative, using a process developed at that site, resulting in lower emissions from target processing than for the other alternatives. This system was not assumed for any alternatives other than LANL because it is currently under development, but the Department could use this system at other sites in an effort to keep doses as low as reasonably achievable.

- 4 If the Department decides to proceed with the proposed project, the effort would be coordinated with the private sector. The radiopharmaceutical companies have offered their assistance in executing the medical isotope production activities. The project would be carried out in accordance with all applicable DOE orders and other environmental, safety and health requirements.
- 5 Onsite storage of spent nuclear fuel would occur in existing facilities, with upgrades as needed to meet current DOE standards. Any shipments that would occur involving spent fuel, waste, or isotopes would be conducted in accordance with Federal and state standards for transportation of radioactive materials. Detailed planning for such transportation would occur after it had been decided whether to implement the medical isotope project and at which location it should be sited. Appropriate planning for routing of these shipments and contingencies for emergency response in cooperation with state, local and tribal governments would be in place before these materials would be removed from the SNL/NM site.
- 6 Shipment from Portsmouth, Ohio, or Oak Ridge or possibly LANL could all be performed. Portsmouth and Oak Ridge have established programs regarding shipment of highly enriched uranium material, and they do this with some frequency. LANL has little experience in the shipment of highly enriched uranium, but possesses a substantial quantity of the material. Portsmouth or Oak Ridge would be preferable because of their experience. Shipment from LANL is feasible, but LANL is not the Department's planned highly enriched uranium source.

A specific building for storage of the highly enriched uranium has not been designated by SNL/NM. Several buildings in the Tech Area V environs could be made to function as acceptable storage areas.

Historically, Room 108 in the Hot Cell Facility has been used to store highly enriched uranium for the Annular Core Research Reactor. The highly enriched uranium storage vaults at the Sandia Pulse Reactor (SPUR) facility currently contain many kilograms of highly enriched uranium, and this vault facility can easily accommodate more material.

- 7 Sections 3.3.1.4 and 3.3.1.9 describe the replacement fuel. The cost is factored into the annual operating cost of the reactor given in Table 3-1. The number of fuel bundles expended per year is also delineated in Table 3-1, which also refers to the usage of the new fuel design.
- 8 As discussed in Section 3.3.1.9, the ventilation system for the hot cell facility at SNL/NM would contain emission controls to remove both particulates and iodine from the airborne effluents and would meet all applicable Federal, state, and local standards. The majority of radionuclide emissions from target processing consist of noble gases, which are unreactive and are not removed by either the particulate or iodine emission control systems. However, the doses to the public from radioactive effluents that are not trapped by the emission control system would be well within Federal and state standards.
9. The interim spent nuclear fuel storage capacity referred to in Section 5.14 is the total unoccupied storage space which is currently available at the various sites or which would be available following facility modifications proposed in the EIS alternatives. The storage capacity at the Omega West Reactor represents less than 10% of the total available at LANL. Spent fuel could eventually be transferred from the reactor storage pool to other onsite storage at TA-54, or it would be shipped offsite after a suitable cooling period to permit safe handling and transport.

According to the 1995 Record of Decision for DOE's spent nuclear fuel programmatic EIS (SNF PEIS), spent fuel from the Medical Isotopes Production Project would ultimately be transferred to one of DOE's designated regional management facilities for these types of fuel—either at INEL or Savannah River. It was DOE's intent that sites other than those designated in the programmatic EIS would not undertake storage of spent nuclear fuel for longer than necessary. The timing and logistics of the transportation would be subject to arrangements between the shipping and receiving sites. The consequences of transport and storage of spent fuel were evaluated in the SNF PEIS. Compared to the total quantities of SNF managed at DOE's designated regional management facilities, which amounts to several hundred metric tons, the kilogram quantities that would be generated under the proposed action would not substantially increase the risks at these sites.

- 10 An investigation regarding Omega West's age and useful life has been documented in a LANL report titled "Reassessment of the Probable Lifetime of the Omega West Reactor" (LA-UR MO-5031). This report concluded that Omega West could easily operate for at least 10 more years.

A complete 5480.23 safety analysis report (SAR) for the Mo-99 activity has been prepared by LANL. The SAR has not been approved by DOE.

Response to Draft Environmental Impact Statement
for the Medical Isotope Production Project

February 9, 1996

Suzanne Noga
PO Box 6183
Santa Fe, NM 87502-6183
(505) 986-2008; fax 986-0028

DOE
Office of Isotope Production and Distribution, NE-70
19901 Germantown Road
Germantown, Maryland 20874

Att: Wade Carroll, MIPP-EIS Document Manager

Dear Mr. Carroll,

February 9, 1996

The following comments address the information presented by the DOE in its Medical Isotopes Production Project Draft Environmental Impact Statement and its predecessors, the Notice of Intent (NOI), dated July 6, 1995 in the Federal Register, as well as the Implementation Plan, dated September 1995, which reports the results of the Public Scoping Process and provides guidance for the preparation of the draft EIS. The MIPP-DEIS is dated December 1995.

The NOI announced to the Public, the intentions of the DOE to prepare an EIS instead of the Environmental Assessment (EA) which was not sufficient in addressing the issues brought forth by public comment. One of the issues earmarked by the DOE in this NOI was set forth as such;

- " (8) Potential economic impacts, including those from producing radioisotopes for commercial sector use. "

The Implementation Plan outlined comments presented by the Public for inclusion in the DEIS. Under Cost and Schedule the following is recorded;

- " 7. There is no discussion of the overall cost of the technology versus the cost of the medical applications and how the U.S. Government, the taxpayers, will be fully compensated for these costs.(etc.)
10. Why should the taxpayer foot the bill for items that will reap income for the distributors? Why are we unwilling to have the public sector support a health care system but (are) ready to finance private distributors? (etc.)

The disposition of the DOE on the above was: Chapter 3 and 5 will discuss the estimate cost and schedule for implementation of the various alternatives.

In the Draft EIS there are 429 pages.

In the section on Costs (5.22) there are 4 paragraphs and one chart which compares prep and operating costs between the candidate sites chosen by the DOE as alternatives but which actually are the same option exercised at four different locations. The text of this section includes a description of how these costs were achieved and takes up 4 paragraphs.

One other chart, listed on table 5-1 located on 5.4, lists costs for facility modifications and operations for FY1996-FY1999.

After reviewing the Draft EIS, I have located some points of interest with regard towards the economic impact potentials but have found them here and there as a line or two. For your perusal and convenience I have made some notes which I would like to share with you which were taken from the chapter and pages listed.

- iv Nordion & Cintichem only FDA approved suppliers at present.
- 2.2 Nordion supplies 100%US and 85% worldwide Mo-99.
- 3.5 NRU reactor operated by Atomic Energy of Canada Limited (AECL), a Crown Corporation.
- iv Rights for Cintichem process are owned exclusively by US DOE.
- 2.2 Rights sold to US DOE for \$750,000 plus 4% royalty on first five years of production. Title and liability for waste transferred to U.S. and DOE accepts spent fuel. November, 1991.
- Digression on Cintichem:
- 1961 Union Carbide opens reactor
- 1982 Bought by Hoffmann-LaRoche, parent company of Cintichem.
- 1989 Cintichem's HLW classified as LLW. Demands made by public groups that generators keep title and liability for waste. (ref. 1) NIRS presentation 2/25/89
- 1990 Cintichem closed 4/5/90. Expect 3 yrs. to decommission. (ref.2) The Report, RWC.
- 1990 Amersham buys Medi-Physics from Hoffmann-LaRoche but leaves out Cintichem which had been operated through Medi-Physics. Cintichem was cut out of the deal on 6/13/90 because of its regulatory problems. 6/16/90 Cintichem agrees to pay \$300,000 fine and to issue \$5 million letter of credit to guarantee company lives up to its promises with regard to the radioactive clean-up necessary to decommission reactor & plant. (ref. 3) The Time Herald Record, 6/16/90.
- 1990 In September, the plant manager, James McGovern, estimated the cost to repair the three leaks at \$3-\$5 million and decommissioning as much as \$20 million. Instead, Hoffmann-LaRoche decided to get out of the business entirely. However, Cintichem continued to import isotopes from Nordion and shipped them to Amersham who is expected to build its own plant in 3 yrs. (ref.4) The Time Herald Record, 9/6/90
- 1991 Amersham, with Terry Fox, buys Nordion on June 12, 1991 as noted in the Wall Street Journal Index-Corporate News 1991.
- 1991 In November, US DOE closes deal with James McGovern for amount and conditions listed above in DEIS 2.2.
- 1992 Article on \$20 million clean up does not mention who pays. (ref 5) Sunday Record, February 2, 1992.
- 5.2 The pharmaceutical companies that are waiting for their shipments, will not be obligated to buy the US DOE produced Mo-99 or any of the other isotopes. US DOE will throw it away in that case as LLW.
- 6.2 Pharmaceuticals may need FDA approval to market these products.
- B.3 Dupont-Merck, Mallinckrodt Medical, and Amersham Medipysics are the only pharmaceuticals to be shipped to.

1 | It is my opinion that there are costs and economic impacts that are not being explained or analyzed.

I do believe that Teddy Roosevelt said it was best to walk softly but to carry a big stick. I also do believe the Public has been walking softly. I think the big stick comes about with law suits and such.

It appears to me that there has been a monopoly in radioisotopes for many years due to the sources being connected to nuclear businesses or to Governmental Agencies that were producing these by-products.

It seems foolish to me for these same entities to expect to carry on into the new century with these old ideas but old habits die hard.

I also noticed in the DEIS, that the FDA has a restrictive "catch-22". Nordion's European subsidiary is IRE in Belgium who has never sold Mo-99 in the US. To do so they would need FDA approval. The IRE submitted a Drug Master File to the FDA in 1991, but no action has been taken by the FDA because IRE has no US customers. (DEIS 3.6)

Perhaps the FDA might be encouraged to step up interest in medical isotope process and distribution licenses so that new companies can enjoy the benefits of the huge profits that come with very little string attached.

Having brought up information on Cintichem, Amersham or DOE, for that matter, I do not wish to impose judgement or imply impropriety but there is a long term relationship going on here and the Moly-folk seem to intermarry.

Although the DOE has declared long-term Mo-99 production a private sector issue, I believe it is being demonstrated that the private sector is unwilling to proceed with that course and why limit ourselves to the short term? If Nordion has 100% of the US market, then the US DOE can have that entire market in the not so distant future and make a good profit for the Treasury. By absorbing the responsibility for production and waste disposal, it would seem only fair to be able to sell it to any and all appropriate takers, domestic or world-wide and the heck with operating in the red.

And for the first five years, why not operate at the barest minimum so as to reduce our financial burden and to give the private sector some time to think about opening their own reactor or participating more fully in the democratic process.

I would assume that that Crown Corporation north of the border knows how to turn a profit. And why not us? After all...good old American know-how shouldn't be out shadowed by foreigners when we're the ones with such enormous purchasing power.

By keeping the production rate way down for five years, there appears to be enough room at the Hot Cell Facility at Sandia, for example, to sufficiently store the waste within the HCF itself.(DESI 3.22)

It should also be noted that refurbishing existing facilities would result in lower environmental impacts than construction of new facilities either by DOE or by a private enterprise.(DEIS 5.80)

7

To reference back to the Implementation Plan used to prepare for the DEIS, the evaluation of isotope and waste disposal by medical users is not considered within the scope of the EIS, (C.16) Nor was the use and administration of isotopes by the medical community considered a candidate for inclusion. (C.28) Nor were any cumulative health impacts from the global disposal of radioisotopes, some of which are disposed of in landfills, found to be appropriate for consideration in this document. In which document are they considered? If there is an international agency charged with this monitoring, I would appreciate knowing about it. If it does not exist then it's time. Who writes the EIS for the whole planet?

The interest in this project was first introduced through the House Government Operations, Environment, Energy and Natural Resources Subcommittee. When Mike Synar charged the DOE with developing a US source of Mo-99, it was anticipated that the isotope program would pay its own way. Since that time, several other realities have set in and that stipulation has been removed from the program but that doesn't mean we need to omit prudence and wisdom in handling our nuclear resources.

Since then, the Committee on Appropriations has stepped in to support the domestic production of medical isotopes, particularly Mo-99. Pete Domenici, a member of that committee, stated on February 14, 1994 at a meeting of the Board of Governors of the National Center for Genome Resources here in Santa Fe in a consensus statement refining the mission of the Center, in part: "In all cases, the primary goal will be the delivery of cost-effective solutions to the pressing resource needs of the national research community and the biotechnology industry."

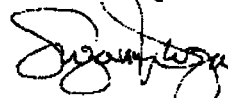
Let us not forget the pressing needs of the US taxpayer.

(It was noted in the New Mexican on 8/24/95 and 11/10/95 respectively, the National Center for Genome Resources received \$10 & \$2 million in federal funds. Just by chance, Merck & Co is represented on the Board. It seems to me that some of these resources could be sold, particularly when there are many large companies that can afford to pay.)
ref. 6 the New Mexican

8

In addition to the environmental impacts analyzed in this EIS, the DOE has announced that it will also base its decision on cost, policy, national need and other considerations. Balance is the key word. We shouldn't charge too much but we shouldn't charge too little either. Integrity, balance and common sense...I hope I've helped to elicit this somewhat and that my comments are helpful and may this be a window of prosperity, not vulnerability.

Sincerely,



Suzanne Noga

ref. 1

Nuclear Information & Resource Service

Presentation, Saturday, February 25, 1989 in Norwich, NY

Radiopharmaceutical Reactor Waste should be high-level.

In New York, we have a special situation, because there is a reactor that generates the short-lived radiopharmaceuticals for most of North America. The Cintichem reactor, in Tuxedo Park, NY, takes stainless steel bottles, lined with U-235, and bombards them with neutrons in the reactor core (in the same manner that power reactors bombard U-235 in fuel rods with neutrons). The bottles are rinsed with chemicals to extract molybdenum-99 which decays into technetium-99m which is used in medicine. The radiopharmaceutical products are short-lived but the reactor wastes are similar to the wastes from any reactor. Some of the wastes are really high-level, by federal definition of high-level waste. But, because of its importance in health care, all of the Cintichem waste is considered "low-level" despite the similarity of the waste to high-level waste and irradiated fuel. Citizens in New York are beginning to demand that the Cintichem waste be considered high-level waste, thus a federal or corporate responsibility rather than a NY State responsibility. This is for the technical reason that the waste fits the description of high-level waste and for the logical reason that the products benefit the entire continent and should not be the motivating reason to site a dump in New York.

Conclusions:

Get the Cintichem (Hoffman-LaRouche) waste from radiopharmaceutical production out of New York's "low-level" waste stream. It should be an industry or federal responsibility, not NY taxpayers.

Redefine "low-level" waste to exclude any waste hazardous longer than the active institutional care period for the dump.

Store the waste retrievably for its entire hazardous life.

Reduce the production of long-lived radioactive waste by implementing alternative means of generating electricity and as many other procedures as possible that lead to waste generation.

Say "no." It may "have to go somewhere," but it IS somewhere. If it shouldn't be where it is, should we keep making it?

Demand that generators keep title and liability for the waste, to encourage the incorporation of waste costs into the real costs of doing business.

ref. 2



THE REPORT

▲ SPRING 1990

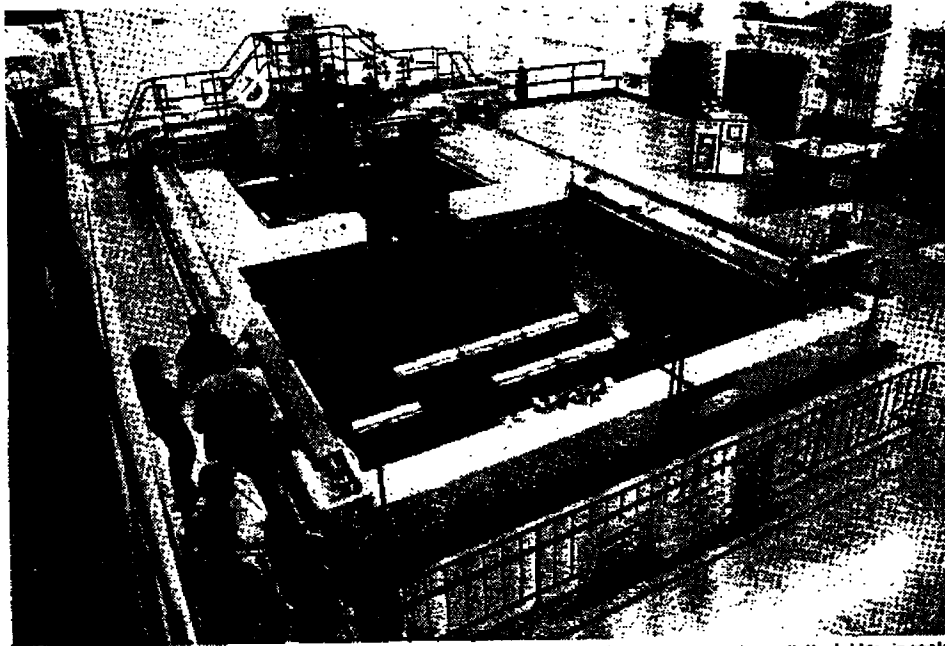
Cintichem Closed!

See Story p. 4

On April 5, 1990, Cintichem announced that it would dismantle its nuclear reactor. Cintichem faced expensive repairs after three radioactive leaks were discovered.

Plans are that the plant will continue to assemble and package radioactive isotopes. But, the raw materials are expected to be brought in from a Canadian company, Nordion International Inc.

Decommissioning is expected to take three years to complete and Cintichem must submit a plan for the dismantling of the reactor to the Nuclear Regulatory Commission (NRC) for approval.



Visitors view the pool where Cintichem's nuclear reactor core, beneath the bridge, is cooled.

embark on a monitoring program designed to pinpoint any lasting or further instances of contamination. The firm must also post a \$5 million bond with the state to assure terms of the agreement aren't violated.

In details of an out-of-court settlement released yesterday, the state Department of Environmental Conservation alleges:

- CintiChem didn't notify the DEC about an Oct. 18, 1989, radioactive leak that registered between 6,000 to 60,000 times the maximum permissible level for two months. The company denies this.
- During heavy rains this past Feb. 9, CintiChem released 30,000 gallons of radioactive water to the Indian Kill Reservoir, which supplies drinking water to more than 150 people in Sterling Forest. CintiChem has said the water was only very slightly radioactive and was released to prevent a dam washout.
- Groundwater tested Feb. 13 showed higher than allowed levels of the radioactive isotope iodine-131. The company denies this.
- CintiChem has never had a valid air emission permit for its isotopes, going back to 1978. The company says the DEC never acted on its application for a permit. The emissions are controlled by terms of a 1978 out-of-court settlement, CintiChem says.

State officials could not be reached for comment yesterday, but a spokesman for the federal Nuclear Regulatory Commission, which actually licenses reactors, says the fine is one of the largest ever levied in the state.

Marvin Resnikoff, a nuclear physicist who was involved in the fight to shut down the plutonium recycling plant in West Valley, N.Y., said the fine against CintiChem "is pretty strong."

CintiChem is seeking the NRC's permission to decommission its reactor. The company pulled the reactor's switch Feb. 9 to undertake extensive leak detection and repairs. The NRC ordered it to remain shut down until CintiChem could prove that there would be no more leaks.

When the reactor went down, CintiChem laid off 27 employees. Wasilewski said yesterday it was hard to say whether there will be further layoffs until CintiChem gets a better idea about when the NRC will approve decommissioning the reactor.

The NRC found 23 violations of federal nuclear standards in the past five years at CintiChem, including employee contamination. During that time, CintiChem was fined \$12,500 for an employee's mild external contamination and was criticized a number of times for lapses in day-to-day operations.

On Wednesday, an English company, Amersham, purchased Medi-Physics, a Paramus, N.Y., subsidiary of Hoffmann-La Roche. CintiChem, which had been operated through Medi-Physics, was cut out of the deal, in part because of its regulatory problems, Wasilewski said.

17 of 62, 21 Terms

in 1990

CINTICHEM WILL PAY MASSIVE FINE

Pg 1 of 2

06/16/90

The Times Herald Record Saturday, June 16, 1990
CintiChem agreement

CintiChem will pay a \$300,000 fine in connection with radioactive discharges at its Sterling Forest plant.

The agreement also requires:

- A \$5 million letter of credit to the DEC to guarantee the company lives up to its promises.
- A groundwater monitoring program, including an extensive hydrogeological study and underground monitoring wells.
- Plans for cleaning up contamination under or above ground.
- An evaluation of air emissions, including the effectiveness of ventilation systems. The company must submit an air permit application.
- Daily sampling of the reservoir at the intake point to the filtration system, including analyses of water quality and aquatic plants and soil sediments.
- Analysis of the plant's safeguards against internal and external contamination from current manufacturing operations.

CintiChem says it has already taken many of steps as part of the company's efforts to satisfy federal Nuclear Regulatory Commission requirements.

ref. 3

6/16/90 2 of 2

ref. 4 p. 1

9/6/90
1421 of 62, 4 Terms
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CINTICHEM TEARS DOWN EQUIPMENT

09/06/90

The Times Herald-Record
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Thursday, September 6, 1990

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ILLUSTRATION: Record photo by Jeff Goulding: Chris Navarra of Queens mans a device that injects grout into cracks of the canal at the Cintichem plant. Record illustration by Sherry Svec: Shows small map of area - and area of cintichem complex.

HEADLINE: CINTICHEM TEARS DOWN EQUIPMENT

BYLINE: By WILLIAM BEREZANSKY Staff Writer

DATELINE: STERLING FOREST

TEXT:

Crews have started dismantling radioactive production equipment at Cintichem Inc., and will eventually level the buildings where nuclear medicines were once produced, company officials said.

The 145 employees at the plant, plagued in the past year by radioactive leaks, face an uncertain future.

Plant manager James McGovern said this week that Cintichem's parent company Hoffmann-La Roche of Nutley, N.J., is getting out of the radio-pharmaceutical business. He said he doesn't know what will happen to the Sterling Forest plant.

"We have no plans right now," McGovern said.

Until this year, Cintichem's wooded campus on the banks of the Indian Kill Reservoir produced most of the drugs the nation used for radiological medical tests.

But last October, a leak was found at the firm's aging 5-megawatt nuclear reactor. Problems, including a leak into the reservoir, persisted until Feb. 9, when the company shut down the reactor. The federal Nuclear Regulatory Commission ordered the company to keep it shut down until the leaks were fixed.

McGovern estimated that would have cost between \$3 million and \$5 million. Instead, Hoffmann-La Roche decided to get out of the business entirely. Decommissioning the reactor and radioactive production areas could cost as much as \$20 million, McGovern said.

Cintichem has hired a consulting firm, and expects to submit a plan for dismantling the reactor to the Nuclear Regulatory Commission by the end of the month, the plant manager said.

McGovern said about half of the company's employees will have work for the next two years helping to put that plan in action. They've already started - painting a series of 6,000 yellow numbered dots on walls, floors and ceilings in the reactor building.

The dots mark where radioactive samples have been taken. The levels are logged to identify low level nuclear waste, McGovern said.

In all, more than 60,000 samples will be measured in the 20,000-square-foot, three-story building.

The plant was built in 1961 as a research reactor for the Union Carbide Co.

Building material that does not show higher than normal radioactivity could

be disposed in a construction and demolition debris site. Cement and equipment contaminated with low-level radiation would be shipped to a federally-licensed low level disposal site at Barnwell, S.C., McGovern said.

At the reactor, workers continue to watch radiation levels.

The highest radiation can be found in the "hot cells" where workers once used glove boxes or mechanical arms to package isotopes. The room is generally closed to workers; special suits will be worn to clean up the rooms.

A pool of water covers the last of the plant's radioactive fuel on the floor of the reactor pool. Once used for cooling the reactor process, the water now acts as a shield to contain the waste.

Eventually, the water will be pumped out and cleaned further before it is released outside, McGovern said. The waste fuel will be taken by the federal

13 of 62, 10 Terms

Pg 1 of 2

mi90

CINTICHEM TEARS DOWN EQUIPMENT

09/06/90

Department of Energy, he said.

Because Cintichem is voluntarily decommissioning, the NRC is not requiring the company keep to a deadline.

However, McGovern said the company's low-level nuclear waste site in Barnwell, S.C. will not accept out-of-state waste after 1993. This would include any construction debris or equipment contaminated by radiation, he said.

Under federal law, companies that generate low-level waste would be required to store or dump their waste in New York state. The state does not have any sites to store or dispose of nuclear waste.

An NRC spokeswoman said a public comment period would be scheduled within several months, after the agency reviews the decommissioning plan.

Since the reactor closed, Cintichem has been importing isotopes to continue packaging pharmaceuticals, in a section of the administration building. About half the company's employees are working on that project. The medicines are sold under a contract with Amersham, an Illinois firm.

But Cintichem expects to run out of work within three years, when Amersham builds its own plant.

"Roche strategically didn't want to be in this business any longer," McGovern said. "It just didn't fit into the mainstream of their business."

ref. 4 p. 2

the region

ref. 3

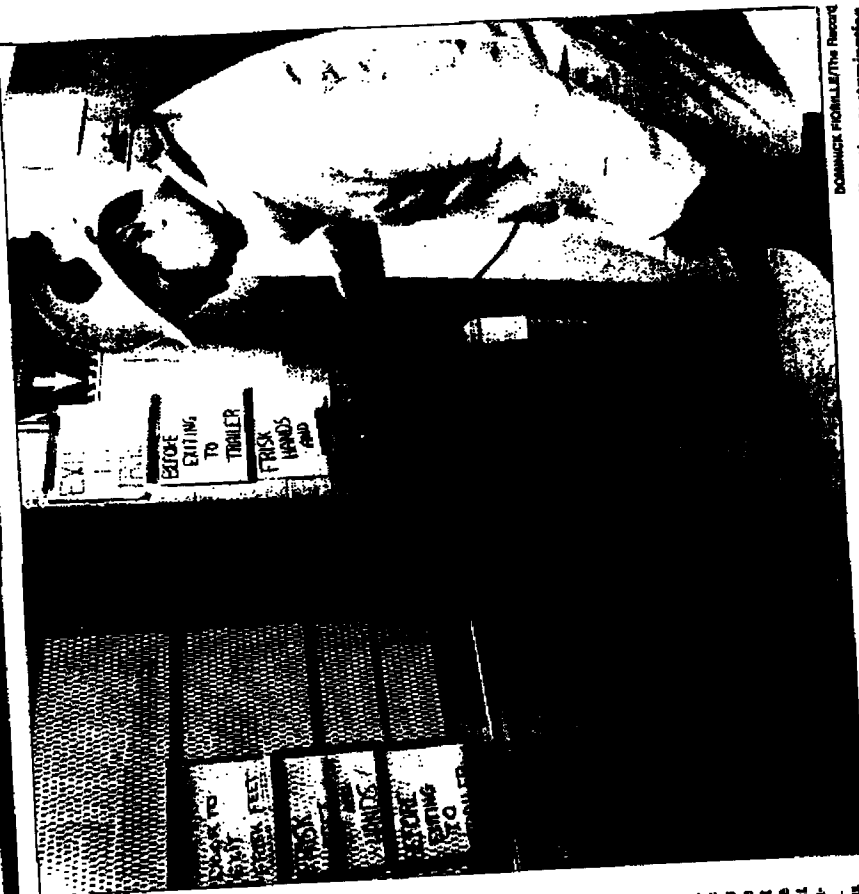
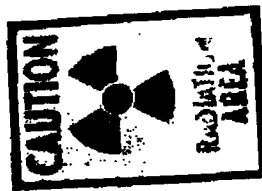
A costly, delicate cleanup

By WILLIAM BEREZANSKY

Staff Writer
STERLING FOREST — How do you take 100,000 cubic feet of radioactive waste out of a 30-year-old, leaky nuclear reactor?

Truck by truck, can by can, that's how Clutchem Inc. of Sterling Forest is dismantling its 5-megawatt nuclear reactor and laboratory. To comply with federal guidelines, the \$20-million plan calls for every square inch of radioactive waste to be collected in shielded 55-gallon cans and removed by flatbed truck.

Clutchem plans to move more than half of the waste to a low-level radioactive waste dump in Barnwell, S.C., which is to close by the end of the year. Clutchem's remaining waste will be stored on the Sterling Forest site until an alternative dump can be found — a fact that worries some local officials and environmentalists. State and federal officials overseeing the dismantling say Clutchem is following the rules and there's no need for concern.



Jay Adler of T.G. Engineering, the consultant overseeing the project, checks for radioactive contamination. DOMINICK FIDELL/The Record

ref. 6

11/10/95

In brief

Genome center to receive funds

The National Center for Genome Resources in Santa Fe will receive \$2 million in federal funds in 1996.

A statement from Sen. Pete Domenici, R-N.M., said the grant will help the center in its

work to unlock the secrets of the human genetic code.

The center's work "to decipher the genetic code will help scientists find treatments for genetic diseases," Domenici said.

Genome center to get \$10 million

The National Center for Genome Resources in Santa Fe will receive \$10 million over a five-year period from the Department of Energy to share information about the sequence of human genes, according to an announcement by Sen. Pete Domenici's office.

The money will go toward developing at the genome center the genome sequence database program, which will facilitate access to information regarding the known sequences of human genes.

8/24/95

The New Mexican

Responses to Comment Letter C076

- 1 A major purpose of the EIS is to ensure that environmental information is available for consideration in the decision-making process. While the EIS does not provide an evaluation of the dollar costs associated with the proposed action, it does provide the best comparable information regarding the cost of start-up and operations available at this point in the process. The Department has attempted to explain the basis and source for the analysis contained in the EIS. Economic impacts that might arise at the alternative sites as a result of potential cost-sharing uses of the production facilities are outside the scope of this EIS.
- 2 The FDA's actions with respect to foreign Mo-99 producers are outside of the scope of the EIS.
- 3 The Department is not proposing to replace the Canadian reactor or to compete with Nordion. Instead, the Department is proposing to establish a backup to the Canadian reactor, to act as an "insurance policy" in case that reactor unexpectedly shuts down. If the DOE decides to proceed with this proposed project, it will operate its Mo-99 facilities at full production capability only in the event of a Mo-99 supply shortage.

If it became apparent that the Canadians were going to be unable to build even one new production reactor, DOE would assess the world supply situation at that point and might investigate the possibility of increasing its role in the Mo-99 supply market or establishing further production capability.

- 4 Unless a supply shortage arises, the Department would produce only as much Mo-99 as is necessary to maintain the capabilities of the facilities and staff to be able to produce 100% of the U.S. demand.
- 5 The reason that DOE has commenced the Mo-99 initiative is the concern that the National Research Universal reactor may be unavailable. For example it is possible that this reactor may be forced to shut down before Maple I (Canada's proposed reactor) is built and running. In this instance, should DOE decide to proceed with the proposed project, full production would be required from the selected site. For this reason, waste generation was calculated and planned from a full-production level. However, production at levels lower than 100% would allow greater use of the Hot Cell Facility for interim storage if needed.
- 6 Comment noted.
- 7 The small quantities of radioactive waste generated by the end users (hospitals and medical clinics) would be disposed of according to the arrangements currently in place by those users. It should be emphasized that these users are currently receiving, using, and disposing of Tc-99m generators in their operations and that under the actions proposed in the EIS, only the source of the isotope might change. The types and quantities of isotopes used in medical procedures by these institutions would remain substantially the same as their current practices under any alternative, unless the current Canadian supplier ceased production and no backup supply were available.

Management of radioactive material by commercial institutions, including the pharmaceutical manufacturers, medical isotope end users, and commercial radioactive waste disposal facilities is regulated by the Nuclear Regulatory Commission (NRC). The end users typically return spent Tc-99m generators to the pharmaceutical manufacturers, where the nonradioactive components are recycled. The quantity of residual radioactive material remaining in the generators would be small because of the short radioactive half-life of the isotopes. This waste would be disposed of, along with other radioactive wastes generated

by the pharmaceutical companies, in an NRC-licensed, low-level radioactive waste facility. Any NRC-licensed commercial radioactive waste disposal facility must undergo a NEPA review similar to this EIS before construction, and it must meet all NRC standards for licensing, operation, and decommissioning of the facility during its life cycle.

Any radioactive wastes generated at DOE-controlled facilities by the production of medical isotopes would either be disposed of at a DOE-approved facility within the generation site (in the LANL or INEL alternatives) or shipped to an offsite DOE-approved facility (in the SNL/NM and ORNL alternatives). The impacts of medical isotope waste disposal would be evaluated, in conjunction with other wastes to be managed at the location, by a risk analysis for the ultimate disposal facility (such as a waste management EIS for the receiving site, or other appropriate NEPA review). Because the medical isotope waste would be a relatively small fraction of the waste disposed of at any site, the consequences of such disposal would likely be small by comparison to the total, or to any regulatory standard.

Disposal of low-level radioactive waste at DOE and commercial facilities is regulated by the DOE and the NRC, respectively. In addition, the disposal of waste is subject to any applicable regulations adopted by the receiving state or local governments. The U.S. Environmental Protection Agency has also considered issuing standards for disposal of low-level radioactive waste, but has not finalized such regulations at this time.

- 8 The Department intends to charge the prevailing world market rate for the Mo-99 it produces.

1990 Camino Mora
Los Alamos, NM 87544
February 1, 1996
(505) 661-6505

Mr. Wade Carroll
EIS Project Manager
Office of Nuclear Energy, Science
and Technology (NE-70)
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874-5434

Dear Mr. Carroll:

I am taking this opportunity to comment on the "Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes" draft environmental impact statement (EIS) dated December 1995. I am making these comments as a public citizen, not in my professional capacity. However, so you may judge the value of my comments, I provide the following background.

I am a former nuclear submarine officer with almost seven years of active duty. I was a fully qualified nuclear engineering officer. Following separation from the Navy, I have worked in facilities management in the private sector for two and one-half years. For the last three and one-half years, I have been the leading radiological air quality engineer at Los Alamos National Laboratory (LANL). In this role, I have developed compliance strategies for LANL, reviewed all new LANL projects for regulatory compliance, assisted in the development of Environmental Assessments and EISs, and measured, analyzed, modeled and assessed all radiological air emissions from LANL. I was actively involved in the review and oversight of the Mo-99 program development at LANL prior to the Omega West Reactor (OWR) shutdown. Therefore, I am fairly familiar with most technical aspects of the project.

The attached list details all my questions, comments, and concerns in this draft EIS. Please contact me if you have any questions. Your attention is appreciated.

Sincerely,

Eric A. McNamara

Eric McNamara

**COMMENTS ON
MEDICAL ISOTOPES PRODUCTION PROJECT:
MO-99 AND RELATED ISOTOPES
DRAFT EIS**

1 1) It is not at all clear why Sandia National Laboratory, New Mexico (SNL) was chosen as the preferred alternative. Almost nothing in the EIS, in terms of environmental impact, cost schedule, or organizational capabilities, supports SNL as the preferred alternative. The following items specifically listed in the EIS specifically indicate SNL as a non-preferable alternative:

- 2
 - The collocated worker dose from normal operations is second highest of all alternatives (Table 3-1).
 - The MEI dose from normal operations is second highest of all alternatives (Table 3-1).
 - The population dose from normal operations is second highest of all alternatives (Table 3-1). In addition, as discussed later, the true population dose will be much higher than shown.
 - The population dose to project workers is the highest of those calculated (Table 3-1).
 - The annual incidence of illnesses and injuries to workers is the highest of the alternatives (Table 3-1).
 - The dose to the public and the transportation crew from incident free transportation is the highest of all alternatives (Table 3-1).
 - The population dose from the analyzed accidents for target irradiation from the inhalation/external pathway (the pathways of greatest concern because they cannot be controlled) is the highest of all alternatives (Table 3-1). In addition, as discussed later, the true population dose will be much higher than shown.
 - The population dose from the analyzed accidents for target processing are the highest of all alternatives (Table 3-1). In addition, as discussed later, the true population dose will be much higher than shown.
 - The resource usage for construction is the highest of all alternatives (Table 3-1).
 - The usage of highly enriched uranium (HEU), stainless steel, and chemicals for operations is the highest of all alternatives (Table 3-1).

- The quantities of liquid waste is the highest of all alternatives (Table 3-1).
- The total cost for construction and operations is the highest of all alternatives after just two years of operation (Table 3-1).
- The most extensive facility modifications of all alternatives would be required, especially in the hot cells (Table 3-2 and §3.3.1.2).
- The least spent nuclear fuel (SNF) storage. In fact, the long-term requirements for SNF storage at SNL have specifically not been included in costs, schedule, etc. Only limited production requirements were included (Table 3-2 and §3.3.2.4).
- The current ventilation for the SNL hot cells is described as inadequate, and even the planned upgraded ventilation system is only a single stage HEPA and charcoal system as opposed to two stage systems at LANL (Table 3-2).
- The total schedule from record of decision (ROD) to full production capability is the longest of all alternatives (Table 3-2). Although it is true that SNL shows the shortest time to initial production, the stated intent of the project is to be able to produce 100% of the Mo-99 demand in the event Nordion shuts down. I do not believe that a quick turn-around to initial production, but a long turn-around to 100% production capability meets this intent.
- Low-level wastes must be shipped off-site (Table 3-2).
- SNL has no isotope production history or experience (Table 3-2, §3.3.1, and §13.3.2).
- SNL is in the highest (most restrictive) seismic zone of all the alternatives (§3.1.6, §3.2.6, §3.3.6, and §3.4.6).
- SNL does not and will not have a spare hot cell capability (§3.3.2.6).
- SNL does not have an existing capability to recycle fuel (§5.14.1.1).
- No other alternative would require transportation of targets before irradiation.
- SNL has less developed separations capabilities and knowledge (§3.1.2).
- SNL does not have target production capabilities that already exist elsewhere (§3.3.1.1).
- The planned configuration for the annular core research reactor (ACRR) is an unproved configuration. All other alternatives would operate in a configuration that has many years of proven service (§3.3.1.4).
- The potential exists to lose this facility to national defense needs. This alone seems to defeat the entire purpose of the program (§3.3.1.9).

- Other sites have waste compacting capabilities that SNL does not (§3.3.2.2).
- It has been stated in the afternoon public meeting in Albuquerque that SNL, as an operating reactor, would not have to "staff up" for this project, as would the other sites. Since SNL would have to transition from operating at something less than eight hours per day, five days per week to an operating schedule of twenty-four hours per day, seven days per week, it seems they also would require significant additional staffing.

This extensive list seems to raise significant questions regarding the preferred alternative. I grant that each alternative has advantages and disadvantages, but I don't believe the plethora of issues exists at any of the other sites as exists at SNL.

2) Page 3.4, §3.1.2 indicates a potential need to dispose of Mo-99 that couldn't be sold? With such a short half-life, why wouldn't it be stored until decayed and then disposed of as non-radiological trash?

3) Page 3.41, §3.3.3.4, states both "the reactor would be solely dedicated to the production of Mo-99" and "costs could be offset by sharing expenses with other users of its experimental facilities". These two statements seem to contradict each other.

4) Page 4.3, §4.1.1 says current SNL operations releases 218 Ci/yr of Ar-41. Page 4.11, §4.1.7.2 says 1993 releases were 3.2 Ci. These two statements do not coincide. In addition, neither of them particularly supports the contention that increased operations of ACRR (even with the removal of the air core) will result in 2.2 Ci/yr of Ar-41 release (Table 5-2).

5) Page 5.33, §5.14.1.1 refers to "high-activity, low-level liquid waste". Is it really high-activity or low-level?

6) Page 5.43, §5.15 states that "population" doses were only calculated for the most impacted sector. This in no way provides a true picture of total "population" dose. Neither is it an equitable comparison. Although I have no personal knowledge of Oak Ridge's environment, both LANL and Idaho Falls (INEL) have populations predominately in one sector and the given figures are reasonable. SNL however has large populations close to the facility in several sectors and the true total population dose is probably (almost certainly) much higher than what is shown. There is no valid technical

23 |

reason to calculate a "population" dose in only one sector. A true population dose should be calculated, analyzed, and reported for all sixteen sectors.

Responses to Comment Letter C077

- 1 The Department has not made a decision regarding if and where to conduct the proposed project. A preferred alternative is identified in an EIS, in essence, to tell the public which way the Department is leaning on a decision, but it does not mean that the decision has been made. Further, Council on Environmental Quality regulations require Federal agencies to identify the preferred alternative in a Draft EIS if the agency has one and to identify a preferred alternative in a Final EIS.

The Annular Core Research Reactor/Hot Cell Facility (ACRR/HCF) combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.

- 2 The comment restates results presented in the EIS summary table (Table 3-1), with reference to impacts of implementing medical isotope production at SNL/NM. The EIS presents information on the relative health consequences, risks, resource use, costs, and waste generation associated with each alternative, along with other pertinent factors, to assist the decision maker in making its decision on whether to undertake the proposed production of medical isotopes and at which site (if any) such a project should be located.
- 3 The Department recognizes that the estimated preparations costs for SNL/NM are the second lowest and that the estimated operating costs are the highest. The uncertainties associated with the estimated cost of the SNL/NM and LANL alternatives are lower than for the other alternatives. If the Department decides to proceed with the proposed action, the information presented in the EIS (including cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

Regarding the necessary modifications for each alternative, the modifications to the SNL/NM Hot Cell Facility are recognized to be more extensive than the modifications required for the hot cells at the other alternatives.

- 4 All of the reactors currently have sufficient fuel to support initial operations at the low production levels proposed in this EIS. The schedule for replacement and storage of existing fuel would depend on the production requirements for Mo-99, which would be low unless DOE were called upon to replace the existing supply for an extended period. Even at full production levels, SNL/NM has enough existing spent fuel storage space for 6 years of operation, and this could be expanded. The costs associated with spent fuel storage were included in the cost of reactor operations to the extent possible and would not be expected to differ substantially between alternatives.
- 5 The ventilation system proposed for the hot cell facility at SNL/NM, or the ventilation systems for any of the alternative hot cells, would contain emission controls to remove both particulates and iodine from the airborne effluents and would meet all applicable Federal, state and local standards.
- 6 As shown in Table 3-2, the estimated time required to full production for the preferred alternative is second shortest, tied with the LANL alternative.

The ability to produce even a small amount of Mo-99 in a short period of time is important in that, if a Mo-99 shortage were to occur in the near future, the Department would be able to supply at least a fraction of the U.S. demand. The Department has proposed the Medical Isotopes Production Project to respond to a

near term "window of vulnerability" in the Mo-99 supply situation; therefore, the ability to produce even a small amount of Mo-99 in a short period of time is an important factor and will be considered in the Department's decision on the proposed project.

- 7 The Department recognizes that "cradle-to-grave" waste management is a benefit of the INEL and LANL alternatives and will consider this factor in making its decision on the proposed project.
- 8 As shown in Table 3-2, the Department recognizes that all sites under consideration except SNL/NM have significant isotope production experience.
- 9 Although significant seismic activity at any alternative site is a relatively rare occurrence, differences in potential for facility damage are reflected in the seismic safety requirements for facility construction at each location. Because all facilities or modifications would meet the seismic safety requirements appropriate to their locations, the level of risk associated with potential seismic damage to medical isotope production facilities is expected to be similar for all EIS alternatives.
- 10 At full production, SNL/NM would have excess hot cell capability for certain Mo-99 production steps, but would not have as much spare hot cell capability as other alternatives. Currently, DOE does not plan to recycle any spent nuclear fuel that would be generated as a result of the proposed project. The capability to recycle uranium extracted from targets is currently available at LANL, but the technology could be implemented at any of the alternative hot cell facilities.
- 11 The commentor is correct, three of the four alternatives will fabricate targets onsite. The preferred alternative will utilize the target fabrication experience and expertise at LANL, although the option exists to fabricate targets at SNL/NM (see Section 3.3.1.3).
- 12 The Department recognizes that the isotope separation chemistry experience at SNL/NM is not as extensive as any of the other three alternatives. However, SNL/NM personnel are developing separation chemistry expertise by working with LANL in the verification of the Cintichem separation process and would continue to develop this expertise if SNL/NM were selected for the proposed project.
- 13 As discussed in Section 3.1, the preferred alternative would have targets fabricated at LANL. Also, as discussed in Section 3.1, the target fabrication process that is being validated by LANL would be transferrable to any of the alternative sites.
- 14 The ACRR proposed configuration is predicated on calculations. Significant testing activities will be conducted during the reactor startup and power escalation periods. Neutron flux levels, target irradiation zone power distributions, natural circulation cooling of the targets, and the dynamic effects between effectively two separate, neutronically coupled concentric cores must be verified through the planned testing activities.
- 15 It is possible that the ACRR, the preferred reactor for the proposed project, could be diverted to support defense-related missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.
- 16 Comment noted.

- 17 The statement was that "Because it is a currently operating reactor, and it has the trained operators on board right now..." The commentor is correct that additional staffing would be required to reach a 24-hour, 7-day/week capability. The objective of the statement was that SNL/NM could begin initial reactor operations for the proposed project quickly, to act as a backup to the existing supplier.
- 18 As with any project, there are uncertainties and issues associated with each of the alternatives considered in the EIS, including the preferred alternative. These issues are identified throughout the EIS.
- 19 Mo-99 and Tc-99m eventually decay to form Tc-99, which has a long half-life (about 216,000 years) but is still radioactive. The unsold Mo-99 would be allowed to decay before disposal to reduce the activity level, but the remaining Tc-99 would still be mildly radioactive and would be disposed of as low-level waste.
- 20 The term "solely dedicated" should not have been used. The commentor is correct. If ancillary programs are undertaken to offset the operating cost, then the facility is not solely dedicated to the production of Mo-99 and related isotopes. Some of the costs could be offset by sharing expenses with other users of its experimental facilities on a non-interference basis. Section 3.3.3.4 of the EIS has been revised to reflect this comment.
- 21 The estimated emissions for ACRR in Section 4.1.1 refer to hypothetical continuous operations with the current core configuration. Because the reactor did not operate continuously during 1993, the releases reported for that year (see Section 4.1.7.2) were lower. The estimated ACRR emissions for the EIS proposed action (Table 5-2) were based on historical operations, with adjustments for changes to the core configuration that would remove the major source of argon-41. This estimate is consistent with an SNL/NM analysis of projected emissions from the reconfigured reactor (Section 5.7.1).
- 22 The terminology used is correct.
- 23 Population dose estimates for routine (i.e., relatively continuous) emissions from facilities consider the total population within 80 km of the facility, accounting for the fraction of time the wind blows toward each sector.

Because accidents are short-term scenarios relative to normal operations and because the wind cannot blow in all directions simultaneously, the population impacts are typically evaluated for a bounding condition. For the purposes of this analysis, the wind was assumed to blow in one direction under minimum dispersion atmospheric conditions during the entire release, and the direction was chosen to maximize the population dose. If the wind direction were assumed to change during the course of the accident, a larger population might be affected, but the quantities of radioactive materials to which those populations are exposed would be lower, resulting in a smaller total collective dose and a lower average dose to the downwind individuals. The analysis in the EIS was designed to maximize the potential population dose for each accident by choosing a single wind direction, which is noted in the text and tables of Section 5.15.

February 1, 1996

I brought a special guest here to the meeting, this is my son Ian Todd Dempsey. I took Ian on a tour around the CMR building, and past the Omega West Reactor before we came here. Ian was too young to remember when he had Tc-99, but I explained to him that he was very sick and that it helped to save his life. Ian has a scar on his stomach from the two surgeries he had performed on him when he was six to eight weeks old. The first surgery was unsuccessful because the problem could not be identified with the barium x-ray diagnosis that was used. The second surgery relied on a Tc-99 diagnostic technique, and the Tc-99 was able to pinpoint the problem. Ian has affirmed his support for this project to me.

1 | I have come here tonight to tell you that I read all the portions of the draft EIS for MIPP related to Los Alamos and Sandia and that I want the Medical Isotope Production Project to proceed. I find that the draft EIS is a thoughtful, well written, comprehensive, and informative document. I do have one dissention, I find that the NO ACTION ALTERNATIVE is COMPLETELY UNACCEPTABLE!!! I want the project to proceed here in Los Alamos. I can see the Low Level Waste dump from the roof of my house in White Rock, and I want the project here. I drive past the spent fuel storage area everyday on my way to work, and I want the project here. The Omega West Reactor is behind McDonald's, where my children like to get Happy Meals, and I want the project here. But if some other site in the United States is deemed to be a better location, well so be it. Just as long as we again manufacture this medicine here in the USA.

My job as a contractor for LANL is in Radiation Protection, and I am completely confident that we can produce this medicine without incident. I would not have my family living here, working here, and going to school here if I thought it was unsafe. This is a special community and the people I work with are some of the smartest in the world. We can do this, we can do it safely, we can do it smart, and we can be proud of it, damn proud to be making medicine for our nation.

I heard some crap from protesters on the news from Albuquerque on Monday night (1/29/96), about how this was a pork barrel project, a secret plan to keep the nuclear weapons program alive at Sandia, and that how we should continue to buy our medical isotopes from Canada. I am sorry that some people are so misguided, so unhappy, so uninformed that they will tell and believe lies to support their positions. I don't want to rely on other countries for this vital medicine, and I want us to make the hard choices that keep us strong as a nation. This is a tremendously important project, and it must go forward in some fashion. If the controversy in Albuquerque will prevent or slow this project, then I must insist that the controversy be considered when selecting the site for the MIPP. The people against the project operating at Sandia or the against the project in any form, would

sing a different tune if the medicine was needed to help save the life of one of their children. In 1989, when Taos county voted itself a nuclear free zone, they specifically exempted medical isotopes. Even these rabid anti-nukes saw the need for this medicine. If these people who are against the MIPP were faced with a real life need for this medicine, they would not give a damn where it was made, just so long as they had it.

We in Los Alamos are in a unique position, and can do so much for this project. We have all the required facilities, hot cells, reactor, fuel rods, spent fuel storage, process facilities, and high and low level waste facilities. We can have a cradle to grave operation with little or no dissention FROM THE RESIDENTS OF THE COUNTY. What some of less than objective neighbors think is not important because they have already affirmed their opinion on the necessity of medical isotopes.

At the last meeting related to this project I heard some comments about expense, about pursuing a liner accelerator or liquid reactor technology, and related issues. am not against these ideas, but I know that they are unproven and may require more time than remains before the Canadian reactor shuts down. We must go forward with this proven technology. In the future, if some other method proves more reliable, more cost effective, more efficient, then we will do as Americans have always done and embrace the new way. For the time being however, we must move forward, begin this project and produce this medicine for OUR country. Let us begin, now, here, in this county, doing more work to keep our nation strong, self sufficient, and proud.

Thank You,

Michael and Ian Dempsey
300 Connie Ave.
White Rock, NM 87544

{505} 672-3726

Responses to Comment Letter C078

1 Comment noted.

2 Comment noted.

**GREATER IDAHO FALLS CHAMBER OF COMMERCE**

February 9, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U. S. Department of Energy
Office of Isotope Production and Distribution, NE-70
19901 Germantown Road
Germantown, Maryland 20874

**SUBJECT: COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
MEDICAL ISOTOPIES PRODUCTION PROJECT: MOLYBDENUM-99 AND RELATED
ISOTOPIES**

Dear Mr. Carroll:

On behalf of the Idaho Falls Chamber of Commerce INEL Committee, we
would like to make the following comments on the subject EIS:

- 1) INEL's mission includes medical uses of nuclear technology. The two New Mexico labs are Defense mission labs. DOE should be supporting the labs' assigned missions. INEL has the isotope experience and existing support functions that is not present at the New Mexico labs.
- 2) Earliest production of small amounts of Mo-99 should not be a requirement or the basis for DOE's selection decision. As stated in the EIS (pp iv), the Canadian source is not in question for at least 3-4 years. The need for a backup has existed for seven years! Now is not the time to make a time related decision when only an additional 12 months would be required to do it right. There is no race with time to make the wrong decision to get an inadequate backup. If the Canadian source were to fail it would most likely be a complete failure as stated in the EIS (pp v) and Sandia's backup capacity would not begin to meet the U. S. medical needs. Early capability to meet the full demand therefore appears to be more important than partial supply at an earlier date. **THIS IS OUR MOST IMPORTANT POINT AND WAS NOT ANSWERED AT THE PUBLIC HEARING.**
- 3) Given that 100% or more production requirement is necessary, it is clear that the INEL alternative is the best option. It is the best from a technical sense for medical isotope production, best from an environmental sense and least overall cost (even reduced from the EIS estimates with use of the Chem Plant hot cells, raising the PBF power from that used in the EIS which substantially reduces reactor

"Your Partners In Progress"

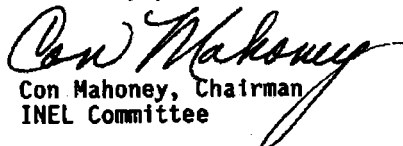
(208) 523-1010 • FAX (208) 523-2255 • 505 Lindsay Blvd. • P.O. Box 50498 • Idaho Falls, Idaho 83405-0498

Mr. Wade Carroll, MIPP-EIS Document Manager
Page Two

3 | modification costs, the more detailed existing PBF estimates as
4 | well as the reduction in cost by cost sharing the operational cost
5 | with the concurrent BNCT treatment option).

- 4 | 4) The ability of the INEL to do the entire medical mission within
5 | site boundaries (no public highways) is also deemed to be a major
6 | advantage and reduces public and environmental risks.
- 5 | 5) The ACRR at Sandia is a reactor facility with a defense mission
6 | which would make commercialization very difficult and severely
 limits the reliability of it as a MO-99 backup even though there
 may not be any present DOD use (defense priority in time of need).
- 6 | 6) There is strong public support in Idaho for the medical mission.
 There was not a single statement in opposition of either of the two
 very well attended public hearings.

Sincerely yours,


Con Mahoney, Chairman
INEL Committee

cc: Secretary O'Leary
Idaho Congressional Delegation

Responses to Comment Letter C079

- 1 As stated in Table 3-2, the INEL, LANL, and ORNL sites all have significant isotope production experience.
- 2 To replace their single existing reactor, the Canadians plan to build two new reactors, each with the capability to produce 100% of the worldwide demand for Mo-99. They plan to have these two new reactors operating by the year 2000, so even if one of those reactors were to shut down, there would be adequate backup production capability at that time.

In the near term, with a single reactor producing 100% of the U.S. demand, a shutdown of that reactor for any reason would result in a Mo-99 supply shortage. The potential for such a shortage is why the ability to produce even a fraction of the U.S. demand in the near term is considered important. This would provide DOE with a Mo-99 extraction process which has met FDA approval requirements in the very near term and would be capable of providing up to 30% of the U.S. demand on an emergency basis. This early experience would also be an asset in the expansion to full-scale production capability.

- 3 All of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99. Power Burst Facility (PBF) operation above the power level assessed in the EIS would incur additional costs and schedule to meet operational requirements for a higher power reactor. The existing PBF cost estimates were a source for some of the information required for this EIS, but were not all-inclusive. Additional cost information specific to the proposed Medical Isotopes Production Project was developed.

The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

As discussed in Section 5, the environmental impacts of the proposed Medical Isotopes Production Project were found to be low and essentially the same for each of the reasonable alternatives.

- 4 The comment correctly notes that the operation at INEL would occur substantially within the site boundaries. Although the risks of some aspects of the project are lower at INEL than at other sites because of this, transportation of separated isotopes would require shipments to the Idaho Falls airport over public roads, and the risks associated with these shipments are comparable for all alternatives.
- 5 If the Annular Core Research Reactor (ACRR) is selected for the proposed project, its mission would be changed from a defense mission to an isotope production mission. The reason that the possible diversion of the ACRR for defense use is highlighted in the EIS is that, in an emergency, the ACRR is more likely than the other reactors considered in the EIS to be used for defense purposes. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.
- 6 Comment noted.

February 7, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U. S. Department of Energy
Office of Isotope Production and Distribution, NE-70
19901 Germantown, MD 20874

Subject: Comments on the DEIS for Medical Isotope Production Project

Dear Mr. Carroll:

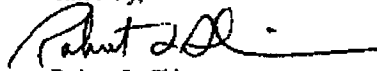
I appreciate the opportunity to comment on the Draft Environmental Impact Statement for the Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes. After reviewing the document I would like to submit the following comments for consideration.:

I am concerned that choosing the ACRR as the preferred alternative does not take into consideration several items:

- 1 | 1. The ACRR is currently located at a facility controlled by the military. If this facility were to be utilized, the military could reassume the facility at any time. This would seem a poor option if you were seeking to attract investors/venture capital.
- 2 | 2. The possibility of utilizing the PBF facility in conjunction with BNCT was not addressed. It would seem that dual usage would save considerable money.
- 3 | 3. If the ACRR is utilized, has the new core option been environmentally approved (EIS submitted and approved)?

Considering the above, I feel the decision to designate the ACRR as the preferred option has flaws.

Sincerely,


Robert L. Skinner

Responses to Comment Letter C080

- 1 The Annular Core Research Reactor (ACRR) is a DOE-owned facility. It is possible that the ACRR, the preferred reactor for the proposed project, could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration and to significantly diminish its potential for privatization. It is expected that the Department will be able to maintain access to the site under all circumstances.
- 2 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 3 Modification of the ACRR for the Medical Isotopes Production Project and any associated environmental impacts are evaluated in this EIS.

Ruth F. Weiner
7336 Lew Wallace Drive NE
Albuquerque, NM 87109
(505) 856-5011

February 8, 1996

Wade Carroll
EIS Project Manager
NE-70
USDOE
19901 Germantown Rd.
Germantown, MD 20874-1290

Dear Mr. Carroll,

Please enter the following statement into the hearing record of the Mo-99 Draft EIS:

The radiation doses during incident-free transportation to people living and working along the transportation routes were probably over estimated by about two orders of magnitude. The total doses were presented, which included the stop dose (which was itself ridiculous in many cases). The correct dose to cite is the off-link dose, which is usually about two or more orders of magnitude smaller than the total that includes the stop dose.

Ruth F. Weiner

Response to Comment Letter C081

- 1 Comment noted. The assumptions were consistently applied for all alternatives.

**IDAHO FALLS
MEDICAL
SOCIETY**

**6991 Limousin
Idaho falls, idaho 83404
(208) 524-6370**

February 6, 1995

Wade Carroll, MIPP
EIS Document Manager
Office of Nuclear Energy, Science and Technology, NE 70
US Department of Energy
19901 Germantown Road
Germantown, Maryland 20874

Dear Sir:

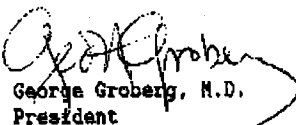
The Idaho Falls Medical Society supports the production of medical isotopes at the Idaho National Engineering Laboratory near Idaho Falls.

We feel that the use of the power burst facility at the INEL would be superior and would be most cost effective and best in line with our national interests. These isotopes are medically necessary, and the advantages of doing them with the power burst facility are as follows:

1. The power burst facility reactor is the only one using the low enriched uranium which reduces waste generation and security requirements
2. PBF can dispose of low level waste generated on site, while an alternative would require packaging and shipping across state lines to the Nevada test site
3. The low cost of the operation of the PBF along with the spent fuel produced and the air quality impact are important factors
4. The PBF is the only choice which envisions the private sector taking over production
5. The reactor used for this would also be suitable for the cancer treatment mission if that is pursued
6. There is technical ability to produce 100% of the nation's demand for these medical isotopes with the PBF
7. The initial expenditure and operation expense is at least one-third lower than the alternatives, if done at the PBF site near Idaho Falls

On behalf of the Idaho Falls Medical Society, I am writing in support of this project.

Sincerely,


George Groberg, M.D.
President

GG:k

Responses to Comment Letter C082

- 1 Comment noted.
- 2 Comment noted.
- 3 The Power Burst Facility (PBF) is the only option currently using low enriched uranium fuel. All the other options evaluated in detail have designs for converting to low enriched uranium. The objective is not to build any more highly enriched uranium fuel bundles for any of the other options, but to use the fuel already on hand until the supply is exhausted or, in the case of the Annular Core Research Reactor (ACRR), until the burnup limit is reached (see Section 3.3.1.9). Two or three transition cores of both low enriched uranium and highly enriched uranium would be used during the conversion to all low enriched uranium fuel for these options. This is a long-term safeguards advantage, in that it depletes and irradiates the weapons grade material on hand.

It is not true that use of low enriched uranium fuel minimizes waste. More spent fuel bundles are generated per reactor full power year with the use of low enriched uranium bundles.

- 4 The INEL alternative and the LANL alternative both allow the small quantities of low-level waste to be stored onsite. The preferred SNL/NM alternative and the ORNL alternative would require some shipment of low-level waste to the Nevada Test Site (NTS).
- 5 The estimated operating costs of each alternative are presented in Section 5.22, the estimated fuel utilization of each alternative is presented in Table 3-2, and the air quality impacts of each alternative are discussed in Section 5.7. Each factor is important and will be given due consideration as the Department formulates its decision on the proposed project.
- 6 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE. The Department is aware of this potential for the INEL alternative. Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.
- 7 As mentioned above, IBTC has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be useable for BNCT. If the Department decides to pursue this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected for medical isotope production.
- 8 All of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99.

- 9 The preparations costs for the INEL alternative, as shown in Section 5.22, are estimated to be about \$2.4 million (or about 12%) less than for the preferred alternative. The operations costs for the INEL alternative are estimated to be about \$4.4 million (or about 34%) less than for the preferred alternative. However, the uncertainties associated with the cost estimates for the INEL and ORNL alternatives are expected to be greater than for the LANL and the preferred alternative.

330 Hartert Dr.
Idaho Falls, ID 83404
February 9, 1996

Mr. Wade Carrol
MIPP EIS Document Manager
Office of Nuclear Energy
Science and Technology (NE-70)
U. S. Department of Energy
19901 Germantown Road
Germantown, Maryland 220874

Dear Mr. Carrol:

I am writing to comment on the draft EIS since I was unable to attend the public hearing held in Idaho Falls on January 17. I am employed at the INEL, but these are my comments as a private citizen.

1. It does not appear that the the correct distances were used in estimating some radiological doses to the public. The nearest public road to PBF is the state highway which crosses through one edge of the site 11 km from PBF.

2. As I remeber my last visit to Sandia, the Lab is at th edge of a military base and anyone can drive right up to the front gate. The ACRR facility is right in the Lab complex and not remotely located from the complex or the gate.

3. 2. In assesing the possible radiological consequences, and changes to the desigh of the ACRR reactor core and internals, no basis was presented for some of the assumptions. It appears to me that fuel melting has been assumed to be a beyond design basis event for the ACRR taking credit for the existing ACRR core design and operation. I don't see any discussion as to how this will be assured in the new core and internals design which will employ a "TRGA" type fuel design without the retaining the inherent reactivity feedback normally associated with TRIGA fuel. The proposed operation includes a substantial increase in the steady state power. No details were provided on possible effects and required mitigating features.

4. 3. If PBF were to be chosen, there still exists a considerable reservior of key technical and managment people employed at the INEL who could form the nucleus of a project team to modify and restart the facility.

5 | 4. Isotope production is consistent with a present mission
at the INEL and processing of the target material may be
compatible with remaining work at the Idaho Chemical
Processing Plant.

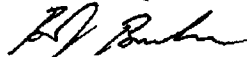
6 | 5. The INEL is noted for its ability to build and manage
large nuclear facilities and to manage multidisciplinary
projects. The MIPP appears to be particularly suited to
strengths at the INEL.

7 | 6. Work is formatively started to privately develop PBF as
a BNCT treatment facility. It should be possible to
integrate these two projects and cost share overlapping
work. This would produce cost saving to the taxpayer and
reduce BNCT patient treatment costs.

8 | 7. The time to restart PBF for isotope production should be
very comparable or even faster than the time it will take to
complete the extensive modifications proposed for the long
term use of ACRR. It should be possible to make the near
term minor changes at ACRR to start isotope production with
the existing ACRR core. At the same time start work on a
PBF isotope production restart. This would provide
essentially the same schedule for isotope production and
result in considerable savings to the government.

Thank you for your consideration.

Sincerely,



Brent J. Buescher

Responses to Comment Letter C083

- 1 The access point assumed for the Power Burst Facility (PBF) is actually a thermal luminescent dosimetry monitoring station at the area boundary. In the absence of more detailed information, it was assumed for purposes of the analysis that a member of the public could gain access to this location. The analyses presented in the EIS for consequences at the public access location following accidents at the PBF are therefore more conservative (i.e., estimate a higher dose) than if the highway location were chosen. In addition, the location evaluated for the offsite resident is about 12 km away, which would not differ substantially from the public access location on the highway. Changing the public access location would not substantially change the conclusions reached in the EIS because the accident risk associated with operation of any of the facilities is low.
- 2 The SNL/NM facilities are located throughout the Kirtland Air Force Base (KAFB). The area in which the Annular Core Research Reactor (ACRR) and the Hot Cell Facility (HCF) are located is remotely located and not near the Base boundary.
- 3 Although the ACRR would operate at increased power under the alternative proposed for the EIS, it would still employ convection cooling. Therefore, a flow blockage scenario similar to that evaluated for the other reactors would not represent a reasonably foreseeable accident. If it became necessary to modify the reactor core to accept a TRIGA-type low enriched uranium fuel, the existing safety basis for the facility would be re-evaluated to determine whether the conversion substantially increases the risk associated with its operation. The fuel damage scenario evaluated in the EIS for the ACRR is expected to bound the consequences of an accident after such a conversion.
- 4 Each of the alternative sites has the technical and managerial capability to execute the proposed project.
- 5 As stated in Table 3-2, the INEL, LANL, and ORNL sites all have significant isotope production experience.
- 6 Comment noted.
- 7 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be useable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 8 Comment noted.

JOHN R. HORAN
 RADIATION PROTECTION CONSULTANT
 1791 CORONADO ST.
 IDAHO FALLS, ID. 83401
 208-723-3322

February 8, 1996

Mr. Wade Cornwell
 MIPP-EIS Document Manager
 USDOE, 20874

Dear Sir,

I would like to make written comments on the Draft EIS for the Medical Isotopes Production Project: Mo 99 and Related Isotopes.

I incidentally did attend the public hearing in Idaho Falls on January 17, 1996 but I was very disappointed in that the hearing had closed before 3 PM and the public recorder was not available. You had advertised the hearing would be open until 4 PM. There were about 6 of us who were told we could make our statements on a tape cassette and they would be included. I would like to be reassured that this was actually acceptable since we went to the trouble of attending and making our presentations on a tape.

After a detailed reading of DOE/EIS-C2490 I concluded that the draft needs major revision since the case for the preferred option has not been made. I am convinced that DOE-HQ made its choice several years ago and are now perverting the EIS process to

(over)

1
2 support their decision. This document contains too many inaccuracies and is incomplete in too many vital areas. A fair comparison has not been made between the Sandia and the INEL proposals, particularly from the cost and Technical support basis.

3 Idaho already has a medical technology program and has produced medical isotopes since the 1950's. The PBF facility can produce 150% of the nation's needs for MO-99 at half its designed power level. While the Sandia ACRS can produce 10-30% of our needs if its power level is doubled.

4 Chairman Hazel O'Leary at the International Atomic Energy Agency in Vienna, last year encouraged other nations to convert from enriched uranium fueled research reactors to using low enriched fuel. Her interests are non-proliferation. The ACRS is a DOE facility using highly enriched fuel while PBF uses low enrichment which reduces waste requirements and security needs.

5 An honest analysis will reveal that the INEL choice would be technically and economically superior as well as the best choice in the long run for the U.S.A.

Respectfully

John R. Horan, CHP

Responses to Comment Letter C084

1 Testimony from the public was taken for the majority of the advertised period of time, 1:00 pm through 4:00 pm. The meeting was recessed for a time when no one was interested in making a comment. However, representatives from the Department, the moderator, and the court reporter remained available to resume the meeting and take public comments until the meeting was adjourned at 4:00 pm. A "quiet room" with a tape recorder was available next to the meeting room throughout the entire 3-hour periods in the afternoon and evening. The comments made in the quiet room have been reproduced and responded to in this section as part of the transcript of the Idaho Falls public hearings. The commentor's oral comments are listed as IDB19.

2 The Department has not made a decision regarding if and where to conduct the proposed project. A preferred alternative is identified in an EIS, in essence, to tell the public which way the Department is leaning on a decision, but it does not mean that the decision has been made. Further, Council of Environmental Quality regulations require Federal agencies to identify the preferred alternative in a Draft EIS if the agency has one, and require that the agency identify a preferred alternative in a Final EIS.

The Annular Core Research Reactor/Hot Cell Facility (ACRR/HCF) combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.

3 All of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99. As stated in Table 3-2, the INEL, LANL, and ORNL sites all have significant isotope production experience.

4 The Power Burst Facility (PBF) is the only option currently using low enriched uranium fuel. All the other options evaluated in detail have designs for converting to low enriched uranium. The objective is not to build any more highly enriched uranium fuel bundles for any of the other options, but to use the fuel already on hand until the supply is exhausted or, in the case of ACRR, until the burnup limit is reached (see Section 3.3.1.9). Two or three transition cores of both low enriched uranium and highly enriched uranium would be used during the conversion to all low enriched uranium fuel for these options. This is a long-term safeguards advantage, in that it depletes and irradiates the weapons grade material on hand.

It is not true that use of low enriched uranium fuel minimizes waste. More spent fuel bundles are generated per reactor full power year with the use of low enriched uranium bundles.

The ACRR is a Department of Energy Facility, not a Department of Defense facility.

5 Comment noted.

Office of the Governor



Telephone
(505) 869-3111
(505) 869-6333
Fax (505) 869-4236

PUEBLO of ISLETA

P.O. Box 1270
Isleta, New Mexico 87022

February 9, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U.S. Department of Energy
Office of Isotope Production and Distribution NE-70
19901 Germantown Road
Germantown, Maryland 20874

Re: Draft Environmental Impact Statement - Medical Isotopes Production Project:
Molybdenum-99 and Related Isotopes

Dear: Mr. Wade Carroll:

The Pueblo of Isleta submits our comments regarding the **Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes Draft Environmental Impact Statement (EIS)**. Unfortunately, the Pueblo can only submit limited comments regarding this proposed project due to our limited environmental staff, their over committed time, and our very limited knowledge of the nuclear industry. However, we do have some specific concerns regarding locating this facility here in New Mexico.

Our first concern is that the EIS process does not take into consideration tribal ability to fully review, assess, and make informed decisions regarding the magnitude of this or any other project beyond our technical knowledge or capability. This greatly limits our participation in this process to determine for ourselves the degree of any potential impacts that may be associated with this project. There is an apparent need for technology transfer to occur on a more basic social level rather than on an overtly industry level. Perhaps then DOE's American Indian Tribal Government Policy could truly be effectively instituted.

The second concern is related to the last sentence of the first paragraph in 5.17 **Unavoidable Adverse Environmental Impacts** of which refers to a scenario of supplying 100% of the current U.S. demand. Information we have received describes the Canada facility as having significant environmental pollution problems associated with it. Our concern is that if this facility had to supply 100% of future production for the U.S., what absolute assurances can be given that those same pollution impacts would not be relocated here?

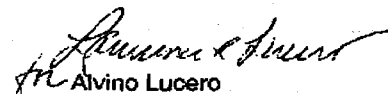
3 | Our third concern relates to how emergency planning and response has been
coordinated with tribal governments and specifically Isleta Pueblo? If an accident
occurred within tribal lands, who would respond and how would such accidents be
mitigated? We are unaware of such communication with DOE in this area.

4 | Lastly, we would like to make sure that those comments and/or questions presented by
Mr. Blane Sanchez at the Albuquerque, NM public hearing were on behalf of Isleta
Pueblo.

5 | Based on Isleta's disadvantage to adequately review this proposed project and based
on previous positions taken regarding radioactive waste disposal from DOE facilities,
we are unable to support this project at this time. If you have any questions, please
direct them to Blane M. Sanchez of our Environment Department, at 505-869-2710.

Sincerely,

PUEBLO OF ISLETA


Alvino Lucero
Governor

Responses to Comment Letter C085

- 1 The Department is committed to actively involving the public, state and local governments and tribal governments. Based on the proximity of the preferred facility site to the Isleta Pueblo, the Department contacted the tribal government representatives during the public comment period to discuss the proposed project, and the Department has noted the tribe's concerns and recommendations. The Department has sought and received input from all entities on the proposed Medical Isotopes Production Project and would welcome any specific suggestions on how this interaction could be improved.
- 2 The environmental impacts of facility operation presented in this EIS are based on historical operation of reactor facilities and of Mo-99 production using the Cintichem process to produce 100% of the U.S. demand. The Nordion facility uses a different type Mo-99 production target and a different isotope separation process and generates higher levels of waste than the Cintichem process. DOE believes that the impacts as presented in the EIS are credible, but conservative, estimates of the consequences of the proposed alternatives.

The Department cannot provide "absolute assurances" that pollution problems would not arise as a result of this project. However, the Department would conduct all production and transportation activities in accordance with applicable and environmental, safety and health regulations. The Department would also implement appropriate environmental monitoring measures to minimize the probability and potential impacts of uncontrolled radiation release to the environment.

- 3 Any shipments of radioactive material that might occur as a result of the Medical Isotopes Production Project at SNL/NM would be conducted in accordance with Federal and state standards for transportation of radioactive materials. The shipment of radioactive wastes resulting from the proposed production of Mo-99 would be merged with the overall site shipments of waste to the waste site. Detailed planning for transportation, public interactions, and emergency response procedures for shipments are within the scope of site-level waste disposal environmental impact statements. Appropriate planning for routing of these shipments and contingencies for emergency response in cooperation with state, local, and tribal governments would be in place prior to removing materials related to this proposed project from the site.
- 4 Mr. Sanchez asked questions of the panel at the Albuquerque meeting and was provided responses at the meetings. Mr. Sanchez did not offer any formal comments for the Department to respond to in this document.
- 5 Comment noted.



Department of
Health & Welfare

State of Idaho**OVERSIGHT PROGRAM • 800/232-4635**
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900 N. Skyline • Idaho Falls, ID 83402 • 208/528-2600 • (FAX) 208/528-2605PHILIP E. BATT
GovernorROBERT N. FERGUSON
Administrator

February 8, 1996

Mr. Wade Carroll
EIS Project Manager
Medical Isotopes Production Project (NE-70)
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874-1290

RE: State of Idaho Comments: Draft Environmental Impact Statement
for the Medical Isotopes Production Project: Molybdenum-99
and Related Isotopes, DOE/EIS-0249D

Dear Mr. Carroll:

Thank you for the opportunity to comment on the above referenced document. Our comments are both general and specific. Attached is a copy of Governor Batt's testimony that was read into the record of the January 17th public meeting in Idaho Falls.

General Comments

1 Based on the information presented in the EIS, a strong case is made for the use of the Power Burst Facility at the INEL rather than the preferred alternative (target fabrication at LANL and isotope production at SNL/NM). The estimated preparation/facility modification cost is lowest at INEL among the proposed alternatives, and estimated annual operating cost is lowest at INEL (tab. 5-52, p. 5.100). "The planned facility modifications at SNL/NM are the most extensive required at any site..." (p. 5.2, para. 5). Also, the INEL has considerable isotope production experience; SNL/NM has none. Boron Neutron Capture Therapy development may also take place at the Power Burst Facility which could result in further cost savings that are not reflected in the cost analysis of the various alternatives.

2 As the isotope production described in this document will essentially start from scratch, DOE has the opportunity to build in a strong waste minimization component. Where possible, waste generation should be eliminated; where that is not possible, any waste produced should be capable of being reused or recycled. Any remaining waste should be of such a nature as to be easily treated and disposed of. As isotope production proceeds, additional opportunities for waste minimization should be examined as they are discovered.

Investigate • Evaluate • Report

3 As DOE's position is that domestic production of Mo-99 should, in the long term, be undertaken by the private sector, an effort should be undertaken by the Department to involve a private company or companies in Mo-99 production. A long-term goal of turning over Mo-99 production to the private sector using leased DOE facilities could also be incorporated. As pointed out in the first paragraph on page 3.48, early privatization might be easiest at the INEL if the BNCT project, also slated for the PBF reactor, is allowed to proceed.

Specific Comments

P. 4.57, para. 5

"The climate and meteorology of the (Oak Ridge) site are typical of a high desert plateau..." This is, of course, incorrect.

P. 4.73, para. 1

Idaho Falls should be added to the list of nearby communities.

P. 4.83, para. 1

4 "Neither INEL nor any of the surrounding counties is designated as a nonattainment area..." Portions of Bannock and Power Counties, within about 50 miles of INEL facilities, are designated as a nonattainment area for PM₁₀.

P. 4.90, para. 6

"Major utility systems serve the INEL site. These systems include water, sanitary sewer, and natural gas pipelines." The INEL site is not served by any municipal sewer lines, nor by natural gas pipelines.

P. 4.92, para. 1

The Experimental Breeder Reactor II is no longer operating, and, therefore, will no longer provide electrical power.

P. 4.92, para. 2 and 3

Annual electricity usages (217,000 at INEL and 31,500 for facilities in Idaho Falls) should be in units of megawatt-hours (MWh), not megawatts (MW).

5

P. 5.80, para. 5

The one paragraph included in this document concerning the mitigation measures that could be taken with regard to this project's impacts is inadequate. A greater effort could and should be made to identify and describe possible mitigation measures.

Should you have any questions regarding the State's comments you may contact Alan Merritt of this office at (208) 528-2600.

Sincerely



Robert N. Ferguson
Administrator

enclosure

cc: Ann Dold, Manager
Alan Merritt, Environmental Scientist
Jerry Downs, Environmental Scientist
Kathleen Trever, Deputy Attorney General
Jeff Schrade, Special Assistant to the Governor
Senator Larry Craig
Senator Dirk Kempthorne
Representative Mike Crapo
Representative Helen Chenoweth
Delbert Farmer, Chairman, Ft. Hall Business Council
File- 20.0 NEPA-EIS miscellaneous



OFFICE OF THE GOVERNOR

U.S. BOX 83720
BOISE 83720-0034

PHILIP E. BATT
GOVERNOR

(208) 334-2100

Governor Phil Batt

*Testimony prepared for delivery
at the*

*U.S. Department of Energy
Idaho Falls, Idaho
hearing on the*

**Medical Isotopes Production Project:
Molybdenum-99 and Related Isotopes
Draft Environmental Impact Statement**

January 17, 1995

To those gathered in Idaho Falls today, I regret that I cannot be there with you. I certainly extend my best wishes to you all.

Let me state my position clearly -- I fully support the effort to produce medical isotopes at the Idaho National Engineering Laboratory.

INEL has an available a reactor that is uniquely qualified to produce these important medical products -- the Power Burst Facility. I support bringing such production on line.

The Power Burst Facility can be started for significantly less cost than any other facility being considered in the Draft Environmental Impact Statement. For this reason and the others outlined in this testimony, PBF at INEL is clearly the facility the DOE should chose to begin the production of radioisotopes.

For far too long this nation has relied on Canada and, to a lesser extent, Europe, to supply the medical isotopes America needs. The time has come for this nation to take care of our own. I commend the Department of Energy for identifying this vital national need. I also commend the DOE for identifying INEL as a possible location for the production of these important products.

I am concerned, however, that the Draft Environmental Impact Statement indicates that the DOE is only looking for backup capability to provide 10 to 30% of the United States Molybdenum-99 (Mo-99) needs. In the final EIS, the DOE should revise the objective and raise the standard. The goal should be to provide 100% of American needs -- and maybe more.

The case for this position -- to provide for 100% of production needs -- is clearly made by the Draft EIS. The document plainly states that if the Canadian reactors were shut down, European sources could only provide "only a portion of U.S. demand." The statement also notes that until a backup production facility is brought on line which is capable of producing 100% of American needs, our nation is "vulnerable to an interruption in the supply of this important isotope." (Draft EIS Summary, page V.)

The case is clear. The United States needs to have the capability for full production of these important isotopes. PBF can fulfill that need.

As the DOE looks to meet the needs of our nation, the Department should also look beyond our nations' border. It is not enough to just satisfy the needs of American customers. The DOE should also begin searching out foreign markets for this important American product. Now is the time to begin.

Once again I commend the Department for identifying the need to produce medical isotopes in the United States. I certainly hope that the DOE will choose the Power Burst Facility at INEL for the production of these important materials.

Responses to Comment Letter C086

- 1 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

As stated in Table 3-2, the INEL, LANL, and ORNL sites all have significant isotope production experience.

The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

- 2 The Department agrees with the commentor and would establish strong waste minimization programs for the Medical Isotopes Production Project at any of the sites. Many of the sites already have strong waste minimization programs that the proposed project could be incorporated into.
- 3 Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis.
- 4 Changes have been made to Section 4 as appropriate.
- 5 Mitigation measures are necessarily discussed in a generic fashion in the EIS because many aspects of the proposed action are not known in detail. After DOE makes its final decision on whether to implement the Medical Isotopes Production Project and at which site (if any) it should be located, a mitigation action plan would be developed if necessary to address site-specific environmental impacts of the project's construction and operational activities. Mitigation measures, if any, are not expected to be extensive, given the low level of environmental impacts of any type associated with the alternatives considered in this EIS.

COMMENT

ON THE
U.S. DEPARTMENT OF ENERGY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE
MEDICAL ISOTOPES PRODUCTION PROJECT

PLEASE PRINT CLEARLY

NAME: Steve Yanicak
STREET ADDRESS: RR 5 Box 394-B
CITY ESPAÑOLA STATE NM ZIP CODE: 87532-9#15
TELEPHONE: 455-1026

1 COMMENT: I think it's very important to
start up the production of these isotopes in the U.S.
-- with the downsizing and condensing of the DOE complex
it makes more sense to do the entire production at LANL.
There are certain environmental concerns with the GOMER,
but with the Lab currently cleaning up release sites
connected with its previous 50 yrs of operations --
I.F. the Lab can permit (and convince residents and activists
alike) to future operations having minimal impacts
on the environment -- honestly -- I don't think this
project would be such a heart-sell to Northern New Mexico --
Let's not continue to make the biggy-up mistakes
of the past if LANL is chosen for this task along
with its other future mission responsibilities --

2 * The EIS pretty much convinces me that there will be little
human health effects

SIGNATURE Stephen Yanicak
DATE 2/1/96

Responses to Comment Letter C087

- 1 Comment noted.
- 2 DOE believes the EIS addresses all required and significant types of potential environmental impacts associated with the proposed Medical Isotopes Production Project. The EIS analysis indicates that these potential impacts would be minimal for all categories of resources.

PO Box 1417
Los Alamos, NM 87544

February 1, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U. S. Department of Energy
Office of Isotope Production and Distribution, NE-70
19901 Germantown Road
Germantown, Maryland 20874

Dear Mr. Carroll

The following questions/comments result from my review of the Draft Environmental Impact Statement for Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes.

1 | Will the record of decision address those actions that the DOE may take to encourage or facilitate commercial molybdenum-99 production beyond simply curtailing their own production when a domestic commercial supplier comes on-line?

2 | On page C.2 is listed the site-specific parameters for the radiologic calculations. From this listing it is unclear whether the radiological calculations for the Omega West Reactor take into account that the reactor itself is in a canyon bottom and the MEI is located on the mesa-top?

3 | From the information in table S-2 there appears to be a wide variation in the person-rem/yr dose estimates for target irradiation and processing from facility to facility. How does the principle of ALARA enter into the decision process for the recommended alternative or the record of decision?

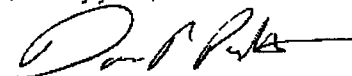
4 | The D&D of Omega West seems to be in planning stages at this time. Are constraints in place to prevent the initiation of D&D on Omega West pending the issuance of the record of decision?

The CMR upgrade EIS/no-EIS decision date on page 1.5 needs updating.

5 | Is it anticipated that the sale of molybdenum-99 will be cover all operational costs of production or will a continuing subsidy of these costs by DOE be necessary? There may be some concern that if such a subsidy were reduced during the life of this project due to budget constraints that shortcuts of proper environmental, safety, and health procedures may result.

6 | I recall that at one public meeting the possibility that the selected reactor may also be used in other capacities, such as neutron activation analysis services or non-medical isotope production, in parallel with its production of the indicated medical isotopes. Will the EIS or record of decision speak to this issue? If the EIS or record of decision fails to address these alternative uses, are such uses precluded without utilizing the NEPA process?

Sincerely yours,



Donivan Porterfield

Responses to Comment Letter C088

- 1 Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis. Since privatization of Mo-99 production is not part of the proposed action for this EIS, the Record of Decision will not have any substantial discussion on privatization.
- 2 Although the Omega West Reactor (OWR) is located in a canyon, the stack by which air is exhausted from the facility actually sits on top of the adjacent mesa. The relative difference in height between the receptor and the top of the stack was accounted for in the dose estimates presented in the EIS.
- 3 The ALARA (as low as reasonably achievable) process implemented by DOE to minimize radiation exposures to workers and to the public is a mechanism by which the costs and availability of "reasonably achievable" measures to reduce such exposure are evaluated relative to the benefits of the lower exposure. The ALARA process would not necessarily require DOE to select an alternative that would result in the lowest radiological exposure. However, if DOE decides to proceed with the action proposed in the EIS, the ALARA program would be implemented at the selected site. DOE will consider potential radiological consequences along with other factors in making its decision.
- 4 The decontamination and decommissioning activities that were planned for OWR have been indefinitely stopped, pending the Record of Decision. The information in Section 4 on the Chemistry and Metallurgy Research Facility upgrade has been updated.
- 5 DOE plans to sell Mo-99 at prevailing world market prices; thus, the costs incurred may or may not be fully recovered, depending on the level of demand. Full recovery of operating costs is anticipated at about 30% to 40% of U.S. demand.

If the Department decides to pursue this project, it will operate the production facilities in accordance with all applicable DOE Orders and other environmental, safety, and health requirements.
- 6 The Department may recognize the potential for other uses in the Record of Decision for this EIS. However, additional NEPA review(s) may be necessary to implement such other uses.

G. Ross Darnell, 339 East 49th South, Idaho Falls, Idaho 83404

February 1, 1996

Mr. Wade Carroll, MIPP-EIS Document Manager
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874

Dear Mr. Carroll:

My subject is: Medical Isotopes Production Project:
Molybdenum-99 and Related Isotopes.
Draft Environmental Impact Statement.

Thank you for bringing your team to Idaho Falls. The meeting was conducted in a highly professional manner throughout.

The EIS was essentially the same for all four potential sites. However, the Annular Core Research Reactor at Sandia National Laboratory in New Mexico is the "preferred alternative" site, even though it is more expensive.

There is one solid reason that it should be the "disqualified alternative." Specifically, the Department of Defense has first claim to the Sandia reactor. In reality, DOD can take-over the Sandia reactor whenever it wants. If that happens, it would likely be disastrous for America for the following reasons: Canada supplies 100% of our Molly 99 today, but when we start creating our own, Canada will likely express little sympathy if we suddenly lose our capability to produce Molly-99. Also, Canada may establish other markets for their Molly-99 that will logically receive priority over the U.S. Or Canada may shut down and buy from us. Thus, America must have the capability to continuously manufacture Molly-99 to at least 100% of its needs.

If the DOD will not officially release its hold on the Sandia reactor, then the Sandia reactor must be disqualified.

Even if the DOD does officially release its hold, it is a fact that military requirements will prevail in national emergencies and DOD can take over the reactor regardless of prior commitments. Therefore, there really is no logical alternative but to disqualify the Sandia reactor. Or, if essential to keep it an option for some legal reason, then classify it as the "least qualified alternative."

Since the Power Burst Facility (PBF) in Idaho could be used simultaneously for the Molly-99 effort and the Boron Neutron Capture Therapy for treatment of tumors, PBF is obviously the best and least expensive medical choice for Americans.

Sincerely,


G. Ross Darnell
(208) 529-8699 or 456-2729

Responses to Comment Letter C089

- 1 The Annular Core Research Reactor (ACRR) is a DOE-Office of Defense Programs facility, not a Department of Defense facility. The Office of Defense Programs within DOE has no current or foreseeable need for the ACRR. That Office has requested that, if the ACRR is selected for this mission, the capability of the reactor to perform defense-related experiments be retained in case of an emergency. The reason the possible diversion of the ACRR for defense use is highlighted in the EIS is that, in an emergency, the ACRR is more likely than the other reactors considered in the EIS to be used for defense purposes. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.

- 2 The Department is not proposing to replace the Canadian reactor or to compete with Nordion. Instead, the Department is proposing to establish a backup to the Canadian reactor, to act as an "insurance policy" in case that reactor unexpectedly shuts down. If the DOE decides to pursue this project, it will operate its Mo-99 facilities at full production capability only in the event of a Mo-99 supply shortage.

If it becomes apparent that the Canadians are going to be unable to build even one new production reactor, DOE will assess the world supply situation at that point and may investigate the possibility of meeting Mo-99 demands beyond the U.S. requirements.

- 3 If the ACRR is selected for the proposed project, its mission would be changed from a defense mission to an isotope production mission.
- 4 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be useable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

Feb. 7, 1996
1734 Horn Ave.
Richland, WA 99352-2314

Mr. Wade Carroll
EIS Project Manager
Office of Nuclear Energy, Science
and Technology (NE-70)
U.S. Department of Energy
19901 Germantown Road
Germantown, MD 20874-1290

Dear Mr. Carroll:

I thank you for the opportunity to comment on the Draft Environmental Impact Statement "Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes", DOE/EIS-0249D dated Dec. 1995. Comments on the EIS are listed below:

1. Pg. IX and Sect. 3.0 (pg. 3.1). Two rather than a single reactor should be made operational by DOE for Mo-99 production for the near term (where "near term" means production over the next five to ten years according to the definition on page 2.2). The goal of a reliable supply will only be achieved if the U.S. has two reactors. As discussed in the Summary section and in Sections 3.0 and 2.0, the U.S. is subject to substantial risk of interruption of our Mo-99 supply since we are currently dependant on a single 40-year old Canadian reactor that will not be operated past the year 2000. Also, if the Canadian reactor were to develop a major problem the reactor would likely be permanently shut down terminating this supply (pg. 3.5), and leaving no other supply ^{source} capable of meeting U.S. needs (p. v).

No decision or funding has resulted from the current discussions by the Canadians on new reactors for Mo-99 production (pgs. IX and X). In addition, previous discussions by the Canadians on developing new supplies failed and were terminated. Thus, there is no guarantee that the Canadians will build a replacement reactor in a timely manner or ever build a new facility. Consequently, the U.S. must have two operational facilities for Mo-99 production in

1 order to assure a reliable supply. Due to the lead time to make facilities operational, the decision to have two ^{U.S.} facilities for Mo-99 production must be made now.

2 2. Pg. VII and ^{sect.} 3.1.1 (pg 3.1). The criterion that "Periodic scheduled maintenance outages must be reliably accomplished in ≤ 6 days" should be deleted. With two U.S. reactors available to produce Mo-99, ^(commingled) outages schedules can be coordinated, eliminating the need for a 6-day requirement. If the Canadian build a ^{single} new reactor and if the U.S. has only one reactor that is acting as a backup, the outage schedules can also be coordinated. If the single new Canadian reactor had an unplanned outage, the U.S. reactor would start immediately to produce Mo-99 by virtue of being maintained in a mode of readiness for operation. Consequently the 6-day requirement should be deleted.

3 3. Pg xi and ^{sect.} 3.4.1.6 (pg 3.56). The reasons given for dismissal of FFTF are not valid: "Facility size (too large), lack of compatible missions, operating characteristics" (pg xi). It is true that FFTF is too large to economically produce Mo-99 as a single mission as stated on page 3.56. However, FFTF is undergoing formal DOE review to evaluate use of the facility to produce tritium and a private consortium has proposed using FFTF for both tritium production and making numerous isotopes. A formal decision is expected in the near future. These developments occurred subsequent to preparation of the draft EIS. Size is a positive factor for FFTF in that a number of missions can be compatible and carried out at the same time reducing costs.

With modification, Mo-99 could be produced continuously and removed from FFTF without reactor shutdown. FFTF has demonstrated high reliability and long periods at power. Planned outages can be coordinated with another Mo-99 production facility to avoid supply interruption.

Remaining facility lifetime significantly exceeds most other available facilities and FFTF has many safety features including a reactor containment building. Considering all factors, FFTF is a good choice for production of Mo-99 and other isotopes.

4. Sect. 3.1.1 (pg. 3.1). The minimum acceptable remaining facility lifetime should be explicitly stated as one of the criteria.

5. Sect. 3.3.1.4 (pg. 3.14), Sect. 3.3.2.4 (pg. 3.31), Sect. 3.3.3.4 (pg. 3.40), and Sect. 3.3.4.4 (pg. 3.47). The remaining facility lifetime should be stated for the ACR, OWR, ORR, and the PDF in the applicable section.

6. Sect. 3.3.2 (pg. 3.29) and Sect. 3.3.2.9 (pg. 3.38). The leak of primary cooling system water from the OWR due to high sulfur content of the soil and repair of the leaking are discussed (pgs. 3.29 and 3.38). However, corrective action to prevent recurrence of the leak is not addressed.

7. Sect. 3.3.2 (pg. 3.29). The text discusses OWR restart under DOE Order 5490.31 but the title of the order "Startup and Restart of Nuclear Facilities" could not be located in the text or the list of references. (suggestion)

8. Sect. 3.3.2.4 (pg. 3.31). The statement is incorrect that "Until it was shutdown in 1992, the Omega West Reactor had been operated by LANL since 1956 without an accident or major operational incident." According to a letter from Steven M. Blush of DOE Headquarters dated Dec. 15, 1992, the OWR was shut down by DOE Dec. 1992 due to significant safety problems (overpower incident, control rod mis-activation incident, and aging). There have been eight incidents of safety significance involving the OWR in recent years, some of which were due to defective design or aging. These incidents were: Reactor cooling water leak due to corrosion or bad welds (Jan. 1993), reactor overpower incident due to operator error and

4.

and inadequate design (December 1992), two instances in which eight control rods dropped without an operator command (August 1992), reactor overpower incident due to an incorrectly calibrated instrument, an open beam port during reactor operations which could have resulted in significant personnel exposures, a radiation detector alarm above the reactor was not turned on while the reactor was operating, and a reactor start-up was initiated with some of the control rod latches not locked.

9. Sect. 3.3.2.9 (pg 3.39). Have ^{all} design-related corrective actions to prevent recurrence of previous incidents involving or related to design been addressed in the required facility modifications for the OWR?

10. Sect. 4.1K (pg. 4.1) and Sect. ^{4.1.6.3} 4.8 (pg. 4.8). The statement is made that statistical studies show that a damaging earthquake ^{occurs} in the Albuquerque area every 100 years. What is the seismic design of the ACRR?

11. Sect. 5.15.2.2 (p. 5.55) and Sect. 5.15.1.3 (pg. 5.49). Table 5-27 on page 5.55 for the OWR radionuclides does not include a number of the radionuclides that are shown in Table 5-22 on page 5.49 for the ACRR.

12. Sect. 5.15.2.2 (pg ^{5.56} 5.54). The offsite doses are given in Table 5-30 (page 5.56) at 1300 m; however, due to the 45 m stack the peak doses would occur at a larger distance. Was this effect taken into account in reporting the maximum doses?

13. Sect. 6.0 (pg. 6.1). DOE Orders 5480.28 "Natural Phenomena Hazards Mitigation", and DOE 5480.30 "Nuclear Reactor Safety Design Criteria" should be addressed in Sect. 6.0 and elsewhere in the EIS.

It is hoped that the above comments will be helpful in preparing the Final EIS.

Sincerely,
James N. Paglieri
James N. Paglieri

Responses to Comment Letter C090

- 1 The Department is not proposing to replace the Canadian reactor or to compete with Nordion. Instead, the Department is proposing to establish a backup to the Canadian reactor, to act as an "insurance policy" in case that reactor unexpectedly shuts down. If the DOE decides to pursue this project, it would operate its Mo-99 facilities at full production capability only as necessary to address a Mo-99 supply shortage.

At this time, it appears that the Canadians will ultimately proceed with their project to construct two new reactors for Mo-99 production. If it becomes apparent that the Canadians are going to be unable to build even one new production reactor, DOE will assess the world supply situation at that point and may investigate the possibility of meeting demands beyond the domestic requirements.
- 2 The Department is proposing to establish a production source that could, if necessary, produce the entire U.S. supply of Mo-99 on its own. The production facility would operate at full capacity only when the Canadian reactor was shut down or the Canadian supply was otherwise unavailable. Therefore, reactor shutdowns could not be coordinated. The 6-day requirement is necessary to ensure that the Department's production facility could, on its own, provide a reliable, continuous supply of Mo-99.
- 3 As discussed in Section 3.4.1.6, the Fast Flux Test Facility (FFTF) cannot meet the selection criteria for a Mo-99 production facility. If the FFTF is restarted in response to the proposal from Advanced Nuclear and Medical Systems (ANMS), the private consortium may wish to produce Mo-99 in the FFTF, and DOE would review its Mo-99 production plans and modify them if appropriate, recognizing that the FFTF cannot provide a continuous supply of Mo-99.
- 4 The Department is proposing to meet a near-term "window of vulnerability" in the supply of Mo-99. The near term has been defined in the EIS as 5 to 10 years. Each of the alternative facilities is expected to have a remaining lifetime of at least 10 years, as discussed below. The oldest of the four reactors under consideration, the Omega West Reactor (OWR), has had a lifetime study performed. The OWR study indicated that the facility could operate for at least an additional 10 years. The other facilities have not had lifetime studies performed. Unlike commercial reactors, which generally have lifetimes of about 40 years, lifetimes on open pool research reactors (such as the four reactors under consideration) are somewhat undefined. Lifetimes for commercial facilities are dictated by two general issues, those being fast fluence embrittlement of the pressure vessel and insulation degradation of the major safety-related electrical cables. Fast neutron fluence on steel will embrittle the metal and make the pressure vessel no longer capable of possessing the design safety margins required for pressure vessels. This problem does not exist in a pool or tank type reactor that is not pressurized. The water distances between the core and the pool or tank walls are such that very little fast flux reaches them, greatly assuaging, or completely abating the embrittlement problem. Small research reactors have small pumps and motors; generally, the current required for their operation does not generate the heat that degrades the cable insulation. Also, cables in small research reactors are seldom laid close together in trays; thus, the cables can be cooled by circulating air. Commercial reactor cables carry large currents and are closely bundled and therefore degrade much more rapidly.
- 5 Please see response to C090-4 above.

- 6 Aggressive remediation activities have been undertaken. The repair of the pipe is not considered to be a technical obstacle to reactor restart. The work was included in the Omega West Reactor (OWR) budget and schedule and the Department believes the figures are reasonable. Two studies have been conducted by LANL that review and analyze the OWR leak cause and remediation. These reports are: *Phase I: OWR Reactor Coolant Loss, Diagnosis, and Surveillance*, and *Stress-Assisted, Microbial-Induced Corrosion of Stainless Steel Primary Piping and Other Aging Issues at the Omega West Reactor*.
- 7 The reference has been added to the reference list. (DOE Order 5480.31 has been updated to Order 425.1).
- 8 Most of these items are not major incidents. The overpower incident was the result of a slow period which resulted in a reactor overpower scram. The reactor behavior was in accordance with design and was not a major operational incident. Unplanned control rod drop is unusual but safe. During the open beam port occurrence, no one was exposed. If someone had been, it would have been a major incident. This did not happen. Startup without the control rod latches locked causes the reactor to remain shut-down, again a safe situation.
- 9 Although significant seismic activity at any alternative site is a relatively rare occurrence, differences in potential for facility damage are reflected in the seismic safety requirements for facility construction at each location. Because all facilities or modifications would meet the seismic safety requirements appropriate to their locations, the level of risk associated with potential seismic damage to medical isotope production facilities is expected to be similar for all EIS alternatives. The Annular Core Research Reactor (ACRR) High Bay was constructed in the 1960's and satisfied building criteria at that time. Modifications to the structure in 1978 also satisfied the Uniform Building Code (UBC) current at the time. Modifications to the ACRR facility will be designed and constructed in compliance with the current UBC and DOE Order 420.1.
- 10 The difference in estimated releases for the two reactors reflects the different scenarios assumed for the design basis accidents at these facilities. The ACRR core design is substantially different from the other reactors, resulting in different types of fuel damage assumed for the maximum reasonably foreseeable accidents. In some cases, the OWR releases group radionuclides by class, and the consequences were modeled using a representative radionuclide that would maximize the dose from the entire group. For ACRR, the individual radionuclides are identified to a greater extent; however, this is not expected to change the conclusions in the EIS regarding the relative safety of the facilities.
- 11 Dispersion of emissions from the OWR during a maximum reasonably foreseeable accident did account for the 45-m facility stack height. This receptor location was consistent with that used by LANL for evaluating maximum impacts at this facility. It should be noted that the OWR is situated in a canyon, which changes the expected dispersion in the case of a radioactive release.
- 12 Section 6.1 of the EIS lists the more significant DOE requirements that would apply to facilities utilized in any of the alternatives, including DOE Order 5480.30. Section 6.1 has been revised to include DOE Order 5480.28.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

February 9, 1996

Mr. Wade Carroll
MIPP-EIS Document Manager
U.S. Department of Energy
Office of Isotope Production
and Distribution, NE-70
19901 Germantown Road
Germantown, Maryland 20874

Dear Mr. Carroll:

In accordance with our responsibilities under Section 309 of the Clean Air Act, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality Regulations (CEQ) for Implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the U.S. Department of Energy (DOE) Draft Environmental Impact Statement (DEIS) for Medical Isotopes Production Project for the purpose of establishing a domestic source to produce molybdenum (Mo)-99, a medical isotope used thousand of times daily in medical diagnostic procedures in the United States.

The DOE is pursuing the Medical Isotopes Production Project in order to ensure a reliable supply of Mo-99 to the United States (U.S.) medical community as soon as practicable. The near term goal is to provide over the next 10 years a backup capability to production in Canada by supplying a baseline production level of 10 to 30 percent of the current U.S. demand. Under the preferred alternative, the Chemistry Core Research Reactor and Hot Cell Facility at Sandia National Laboratory at Albuquerque, New Mexico, would be used for the production of the medical isotopes.

According to the DEIS analysis, under the proposed operating procedures, radiological doses to the public and to involved and uninvolved workers caused from the fabrication, product processing and transport of the isotopes would be well within regulatory limits established to protect human health. The analysis in the DEIS indicate no significant difference in the environmental impacts among the alternatives considered. Community impacts from project employment are projected to be minimal. Impacts to cultural, ecological and other natural environmental features would be negligible for any of the alternatives because existing facilities would be used. Accordingly, the DEIS concludes that no health impacts are anticipated for any reasonable duration of the project.

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The following comment is offered for your consideration in the preparation of the Final EIS:

1 For the Annular Core Research Reactor alternative, at Sandia National Laboratories in Albuquerque, doses from air emissions of radionuclides were estimated to the maximum exposed individual, who is identified as being located 5.4 km north of the facility (Sec. 5.7.1 on p. 5.10). However, an application for approval to modify the facility by constructing this project was submitted to EPA as required by 40 CFR 61, Subpart H. In that application, dated March 30, 1995, the maximum exposed individual was identified as being located at 1,610 meters north-west (NW) of the facility. The respective estimated annual maximum doses are 0.17 millirem, and 5.2 millirems effective dose equivalent. The Final EIS should clarify this discrepancy between the DEIS and the March 1995 application and, if applicable, explain whether or not the individual located at 1,610 meters NW of the facility was considered in the analysis. If so, the Final EIS should discuss the effect on the level of anticipated impacts as discussed in the DEIS.

EPA classifies your DEIS and proposed action as "LO," i.e., EPA has "Lack of Objections". However, we are requesting some additional information for clarification. Our classification will be published in the Federal Register according to our responsibility under Section 309 of the Clean Air Act, to inform the public of our views on proposed Federal actions.

We appreciate the opportunity to review the DEIS. We request that you send our office one (1) copy of the Final EIS at the same time that it is sent to the Office of Federal Activities (2251A), EPA, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460.

Sincerely yours,

Michael P. Jansky, P.E.

Michael P. Jansky, P.E.
Regional 309 Review Coordinator

Responses to Comment Letter C091

- 1 The distance used for the offsite receptor evaluation at SNL/NM represents the location of a full-time resident who receives the highest potential exposure to facility emissions. In some cases, meteorological conditions result in the maximum offsite receptor location being other than the nearest possible access point. Also, other locations to which the public has access may not be residential areas, and the exposures at these locations would be substantially lower than at a permanent residence because they are not continuously occupied.

The location typically used for permitting and compliance calculations at SNL/NM (1610 m NW) is within the Kirtland Air Force Base boundary. This location is not a full-time residence and would not be accessible to the general public and, therefore, was not used in this EIS as the location of the maximally exposed individual. The 1610 m NW location was, however, used in the EIS to calculate the dose for an onsite worker (see Table 5-3 and Table C-1 in Appendix C).

Richard Taylor
1052 ATLANTIC ST.
Idaho Falls, Idaho
83404

1 I would like to state to you
that I support the medical isotope
production project and I believe that
this project should be at the PBF
facility at the INEL.

2 The proposed dual use and
the fact that the PBF reactor is
under a private sector I believe out
weigh the differences in start-up dates

please consider the INEL PBF
facility as the prime location for
molybdenum-99 production

Thank You
Richard L Taylor
1/17/96

Responses to Comment Letter C092

- 1 Comment noted.
- 2 Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis.

BEAUTY FOR ALL SEASONS_®

January 17, 1996

John V. Galazin

President/CEO

Department of Energy
Moly 99 Hearing
Idaho Falls, Idaho

To whom it may concern,

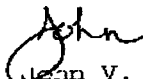
1 | Beauty For All Seasons, Inc., wholeheartedly endorses and supports the DOE's selection of the Idaho Falls PBF Facility for the future production of Moly 99 medical isotopes. Since the DOE cutbacks over the last few years, the city of Idaho Falls has experienced a significant decrease in economic purchasing power of residents in Idaho Falls and neighboring communities. This translates into lower purchases of cosmetics and skin care for Beauty For All Seasons products.

While the company has experienced an increase in sales due to market expansion in 36 countries worldwide, Idaho Falls, the headquarter city for our business has experienced a decrease in sales in the local market that coincides with DOE job cutbacks.

2 | The selection of Idaho Falls PBF Facility for medical isotope production will increase employment opportunities, improve economic base not only directly through people employed at the facility, but also through the ripple effect of increased visitors for technical and medical purposes.

Beauty For All Seasons strongly endorses DOE's selection of Idaho Falls for Moly 99 production in order to help counterbalance the negative economic impact experienced by the community due to DOE layoffs and cutbacks in Eastern Idaho.

Sincerely,



John V. Galazin
President, CEO

P.O. Box 51810
360 B Street
Idaho Falls, ID 83405-1810
Telephone # (208) 525-7800
FAX # (208) 525-7880

Responses to Comment Letter C093

- 1 Comment noted
- 2 The anticipated socioeconomic impacts of the proposed project are presented in Section 5.3. The number of technical and medical visitors to the region as a result of the Mo-99 mission is expected to be small at any of the alternative sites. All sites have the possibility of additional missions.



January 17, 1996

Testimony for the Public Hearing on the Proposed Medical Isotope Production Project
January 17, 1996
Shilo Inn
Idaho Falls, Idaho

Good evening. My name is Daniel Cudaback. I am President and Chief Executive Officer of the Eastern Idaho Economic Development Council. The Council is a non-profit, community based economic development organization supported by nearly 300 for-profit government contributors and partners throughout eastern Idaho. The Department of Energy has recognized the Council as the single voice for economic development in the region, and has designated it as the community reuse organization for eastern Idaho.

The Council's Board of Directors and various committees are made up of over 30 business and government leaders from around the region, from Pocatello to Rexburg, from the Teton Valley to Arco. The Council's programs are designed both to promote maximum and diversified commercial use of INEL resources, as well as promote diversification of the regional economy away from heavy dependence on the traditional government-driven mission of the site. The proposed isotope production facility under discussion this evening makes sense for INEL, on both counts.

The INEL and eastern Idaho community can meet or exceed the standards for the four critical factors necessary for isotope supplier success: reliability of supply, product quality, cost competitiveness, and continuous improvement. Existing, as well as readily developable, facilities at the INEL offer unmatched radioisotope capability. Major assets of the INEL include its reservoir of scientific knowledge, its long history of successful radiopharmaceutical production, its in-place professional network, and its environmentally-sensitive "inside the fence" production capability. Yet as important is the community's virtually unanimous support of the project and its ability to effectively address the proposed facility's fundamental location requirements, now and in the future.

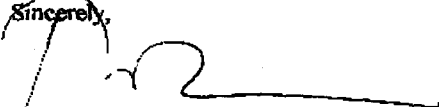
EASTERN IDAHO ECONOMIC DEVELOPMENT COUNCIL, INC.

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1

The Eastern Idaho Economic Development Council strongly supports the Department's Medical Isotope Production Initiative. Further, the Council strongly encourages the Department's close consideration of the INEL as an integral element of Project implementation.

Sincerely,



Daniel Cudaback
President

Response to Comment Letter C094

- 1 Comment noted.

**CITY OF IDAHO FALLS**

Office of the Mayor
City Hall
Idaho Falls, Idaho 83405

Linda Milam
Mayor

Testimony for the Public Hearing on the Proposed Medical Isotope Production Project
January 17, 1996, Idaho Falls, Idaho

Good evening. I am Linda Milam, Mayor of the City of Idaho Falls. I appreciate the opportunity to comment on the Draft Environment Impact Statement for the Medical Isotope Production Project which will produce Molybdenum-99 and related medical isotopes.

Each year 13 million medical procedures, 100 million laboratory tests, and 50,000 therapies using molybdenum and related isotopes are conducted in the United States. Each year, 80% of the world's supply of radioisotopes are consumed in the United States. Each year, the availability of radioisotopes becomes more crucial to the diagnosis and treatment of disease in the United States. The fastest growing segment of the medical isotope market is therapeutic radiopharmaceuticals, including treatment for ovarian, prostate, leukemia, and lymphoma cancers and pain relief for bone cancers. The United States has, by far, the most advanced medical care system in the world.

And yet, this country is subject to the vagaries of commercial, political, geological and weather conditions of other countries to supply the material which is crucial to this sophisticated system. This country does not produce but is an importer of radioisotopes. We must establish this capability in the United States.

The Department of Energy Complex offers unmatched radioisotope production capability. The Idaho National Engineering Laboratory brings a unique mix of scientific knowledge, isotope production experience, facility availability, and an established professional and university network.

I would encourage the Department of Energy to:

- 1) consider the social benefits of establishing a Molybdenum-99 production capacity in this country;
- 2) consider the economic benefits of building that capacity around established strengths;
- 3) consider the environmental, economic, and technological benefits of investing in the development of advanced technologies to produce radioisotopes more effectively and efficiently;
- 4) consider the environmental and economic benefits of building upon the existing isotope production capability, including facility and human resources, such as exist at the INEL;

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3

- 5) consider the environmental benefits of "inside the fence" productions capability, such as exists at the INEL.

4

The decisions to be made on this project will impact all of us, directly or indirectly. Each of us will suffer, either personally or with a loved one, from a cancer or other condition that can be eased or treated with the isotopes produced by a U.S. production facility. The commitment should be made, linkages with private industry and universities should be expanded, and production should begin as quickly as possible.

Responses to Comment Letter C095

- 1 The Department of Energy is a producer of many radioactive isotopes, including isotopes for use in industrial, medical, and research applications. Regarding the supply of Mo-99, the problem is not that the supply is from Canada (or from any other foreign country, for that matter). The problem is that the entire U.S. supply comes from a single source. It should also be noted that this single source accounts for about 85% of the world supply of Mo-99. If this source were to become unavailable, production facilities in other countries would most likely focus on meeting their own needs first and, in any case, would not be able to meet even half of U.S. demand for Mo-99. Given this supply situation, the Department has proposed establishing a domestic production source to ensure that a reliable supply of Mo-99 is available to the U.S. medical community. If the Department decides to pursue this project and at some later date a reliable domestic supply could be ensured by foreign suppliers, then the Department would phase out its production of Mo-99.
- 2 In making its decision on the proposed project, the Department will consider factors such as those cited.
- 3 If the Department decides to proceed with the proposed action, the Department will consider the existing isotope production capabilities and potential environmental impacts arising from medical isotope production at each site. Regarding new technologies for isotope production, all of the production alternatives propose to use the Cintichem process. Research and development of advanced technologies is not within the scope of this proposed action.
- 4 If the Department decides to pursue this project, work will begin as soon as a Record of Decision is issued.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 761-4525 Fax: (505) 761-4542

February 13, 1996

Memorandum

To: Regional Director, Region 2, Albuquerque, New Mexico

From: Field Supervisor, New Mexico Ecological Services Field Office, Albuquerque, New Mexico

Subject: Comments for ER #96-0056, DEIS for the Medical Isotopes Production Project.

This responds to ER 96/0056 requesting comments on the *Draft Environmental Impact Statement (EIS) for the Medical Isotopes Production Project (MIPP): Molybdenum-99 and Related Isotopes (DOE/EIS-0249D)*. This letter has been sent to Roy Perez by electronic mail under the file name "MIPPDEIS.WPD." The U.S. Fish and Wildlife Service New Mexico Ecological Services Field Office (Service) has reviewed the EIS and offers the following comments:

GENERAL COMMENTS

Four alternatives were presented along with the "no action" alternative. The preferred alternative involves target fabrication at the Los Alamos National Laboratory Chemistry and Metallurgy Research Building in New Mexico and subsequent shipment to Sandia National Laboratories in New Mexico (SNL/NM) for testing, processing, and distribution. The second alternative involves the fabrication, testing, processing, and distribution of medical isotopes entirely from Los Alamos National Laboratory. The third alternative entails a similar process at the Oak Ridge National Laboratory in Knoxville, Tennessee. The fourth alternative entails a similar process at Idaho National Engineering Laboratory in Idaho Falls, Idaho. We have restricted our comments to the alternatives proposed in New Mexico.

1 | The natural resources of Sandia National Laboratories were inadequately and
2 | inaccurately characterized to sufficiently evaluate the impacts anticipated under the
3 | preferred alternative. The preferred alternative was not rigorously explored and
objectively evaluated. The affected environment on or near SNL/NM lands was not
described accurately or with equivalent detail necessary to characterize the
environment as were the other sites evaluated. Detailed information about SNL/NM
lands is available (see below) and should be incorporated into the final EIS so that an
environmentally preferable alternative can be identified.

4 The Service concurs that any proposed SNL/NM Annular Core Research Reactor modifications could likely have minimal impact to the local environment. However, other environmental risks associated with the proposed action, including any effluents released into the air, soil, or water, or from vehicular transportation of isotopes should be evaluated relative to potential effects upon natural resources (including nearby wetlands, wildlife habitats) and on surrounding lands managed by Kirtland Air Force Base.

On November 16, 1995, the EIS Project Manager sent a letter requesting a list of endangered, threatened, or candidate species for the project area in New Mexico. Our response was delayed until January 9, 1996, because of the government-wide furlough. We have the following questions:

- 5 |
- What new permits will be required for the management of wastes generated?
 - What is the likely dispersion pattern from discharged effluents and from accident scenarios? Can you quantify (by alternative) the amount of natural resources (wetlands, sensitive species, refuges, national parks, etc.) within the area of concern? Does any alternative have the majority of vulnerable natural resources?
 - What injuries might occur to wildlife species exposed to radioactive air emissions and from accident scenarios? How would these potential injuries be measured and mitigated?
- 6 |

SPECIFIC COMMENTS

Page 4.13, Section 4.1.9.1 Terrestrial Resources

7 The cited reference ("U.S. Department of Energy, 1993b"), for wildlife diversity and abundance on lands managed by SNL/NM, does not appear, by title, as though it would provide an adequate source of site-specific information on this subject. If we are in error about this report, please forward photocopies of those sections that detail the timing of wildlife surveys, methods used, and results of the surveys.

Page 4.13, Section 4.1.9.2 Aquatic Resources

The cited reference ("U.S. Department of Energy, 1995d"), for surface water bodies found on SNL/NM, does not appear, by title, as though it would provide an adequate source of site-specific information about surface water bodies on SNL/NM. If we are in error about this report, please forward photocopies of those sections that detail the methods, timing, and results of these surveys.

8 The statement, "[a]rroyos carry water during heavy precipitation, but no natural aquatic communities of organisms develop in the brief time water is present," is unsupported by appropriate reference materials citing any surveys completed. Amphibians and reptiles are species adapted to and that may depend upon habitats influenced by cycles of wet and dry weather. Arroyos, washes, and ephemeral streambeds provide valuable

8 routes of migration, resting, and feeding habitat for these and other animal species. Therefore, the ecological value of these habitats should receive consideration during planning and reasonable care should be taken to protect these habitats from avoidable adverse impacts.

Page 4.13, Section 4.1.9.3 Wetlands

The statement, "[n]o wetland inventories have been performed for SNL/NM, and no National Wetland Inventory maps have been published," is inaccurate. National Wetland Inventory (NWI) maps are available for SNL/NM and photocopies are attached. Unfortunately, our office does not have all of the maps necessary to provide complete coverage of the project area. However, the additional wetland maps of New Mexico can be purchased by calling the NWI State Distribution Center (413-545-0359) located in the Earth Sciences Information Office at the University of Massachusetts in Amherst.

9 Wetland surveys also have been conducted (or are currently underway) by the U.S. Air Force in conjunction with the Integrated Natural Resources Management Plan (Mr. H. Davidson, Chief, Natural Resources Branch, Kirtland Air Force Base, written communication, Consultation #2-22-95-I-244, dated March 20, 1995). The EIS could be prepared concurrently and integrated with environmental analyses and surveys and studies conducted by Kirtland Air Force Base. Direct, indirect, and cumulative impacts of the proposed action including the effects of any effluents released into the air, soil, or water, and from transportation accidents should be evaluated for any wetlands (e.g., Tijeras Arroyo, Arroyo del Coyote) potentially affected by the proposed action.

Page 4.14, Section 4.1.9.4 Threatened and Endangered Species

10 The statement, "[n]o federally listed threatened or endangered species are known to occur on SNL/NM," was not cited. Several studies of sensitive species and their habitats were conducted near the project area in 1992 and 1993 for SNL/NM (Mr. T.A. Wolff, Team Leader, Risk Management and NEPA Department, Sandia National Laboratories) and the New Mexico Natural Heritage Program. The EIS should integrate the recent environmental analyses and related surveys and studies required by the Endangered Species Act.

Page 5.13, Section 5.9, Ecological Resources

11 The environmental consequences section states, "[n]o ecological impacts are anticipated under any alternative, because activities associated with medical isotope production would occur in previously developed areas of the sites." However, environmental consequences to air quality within a 50-mile radius of each alternative and along transportation routes identified only human receptors in the affected environment. Certainly, other vulnerable and valuable natural resources are likely to occur within a 50-mile radius or along the transportation route and the potential injuries to these resources are foreseeable. Direct, indirect, and cumulative impacts to threatened, endangered, candidate species, or other wildlife and their habitats should be evaluated. This should include the risks to natural resources associated with any effluents released into the air, soil, or water, and from vehicular transportation accidents for each alternative.

11 Perhaps a generic ecological receptor could be identified for the proposed alternatives and concurrently evaluated along with the human exposure scenarios. The parameters for a maximally exposed individual could be altered to reflect a generic mammal and evaluated using your computer models (including the dose-thresholds for humans). For example, the maximally exposed mammal could weigh any where from 0.01 kilograms (weight of a mouse) to 50 kilograms (weight of a deer), breathe the contaminated plume all year, spend all year on contaminated soil, and consume locally grown foods.

12 Finally, the proposed transport route for the preferred alternative is found on state lands and on several tribal lands. We suggest you contact the New Mexico Department of Game and Fish and the New Mexico Energy, Minerals and Natural Resources Department for information concerning fish, wildlife, and plants of state concern. We also suggest you contact the Pueblos of Pojoaque, San Felipe, Sandia, Santo Domingo, and Tesuque for information concerning fish, wildlife, plants, and cultural areas of tribal concern.

SUMMARY

The EIS does not contain sufficient ecological information as it pertains to the affected environment of Sandia National Laboratory. The environmental consequences section should quantify the risks to wildlife and their habitats attributable to the discharge of effluents and in transportation accident scenarios. Without additional information, an environmentally preferable alternative cannot be identified.

If you have any questions concerning these comments, please call Joel D. Lusk of my staff at (505) 761-4525.

R. Mark Wilson
For/ Jennifer Fowler-Propst

Attachment

cc: (wo/attch)

Geographic Manager, New Mexico Ecosystems, U.S. Fish and Wildlife Service,
Albuquerque, New Mexico

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
(Attention: R. Wilson)

Director, New Mexico Energy, Minerals and Natural Resources Department, Forestry
and Resources Conservation Division, Santa Fe, New Mexico

Water Resource Scientist, DOE Oversight Bureau, New Mexico Environment
Department, Albuquerque, New Mexico (Attn: J. Hostak).

Environmental Officer, Pueblo of Pojoaque, Santa Fe, New Mexico

Environmental Officer, Pueblo of Sandia, Bernalillo, New Mexico

Environmental Officer, Pueblo of San Felipe, San Felipe, New Mexico

Environmental Officer, Pueblo of Santo Domingo, Santo Domingo, New Mexico

5

Environmental Officer, Pueblo of Tesuque, Santa Fe, New Mexico

✓ EIS Project Manager, Battelle Pacific Northwest Laboratories, Richland, Washington

(Attn: M. McKinney)

NEPA Coordinator, Sandia National Laboratories, Albuquerque, New Mexico

(Attn: T. Wolf)

References Cited

- U.S. Department of Energy. 1993b. *Nonnuclear Consolidation Environmental Assessment, Volume 1: Nuclear Weapons Complex Reconfiguration Program*. DOE/EA-0792, U.S. Department of Energy, Office of Defense Programs, Deputy Assistant Secretary for Weapons Complex Reconfiguration, Washington, D.C.
- U.S. Department of Energy. 1995d. *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement, Volume 1, Appendix F*. DOE/EIS-0203-F, U.S. Department of Energy, Office of Environmental Management, Idaho Operations Office, Idaho Falls, Idaho

Responses to Comment Letter C096

- 1 The affected environment descriptions in the EIS were intentionally limited to information that is important in evaluating relative impacts of the alternatives, and they were therefore restricted to those resources that are likely to be affected by the proposed action. These descriptions were also reviewed to ensure that they present a comparable level of detail for each alternative. DOE believes the information included in the EIS is presented at a level of detail appropriate to the level of risk associated with the proposed action, which is very low for all alternatives.
- 2 DOE believes that it has explored all of the alternatives in a fair manner, with equal rigor and objectivity applied to each alternative. DOE believes the EIS adequately describes the impacts that might result from implementing the proposed action at any candidate site.
- 3 Please see response to C096-1 above.
- 4 The nature of the activities proposed in the EIS is such that the opportunity for impact on natural resources is minimal. Air emissions consist largely of short-lived noble gases, which ultimately decay to nonradioactive or lower activity isotopes and do not tend to accumulate in the environment. Effluent releases to soil or surface water are not expected from any of the processes other than waste disposal activities, which would take place in engineered facilities permitted by Federal and state agencies.

Transportation associated with the medical isotopes project would utilize existing infrastructure at all sites, therefore no sensitive habitats would be affected by construction of roads or other utilities. Emissions from vehicle traffic associated with the proposed action would be minimal and do not represent a measurable increase over current levels. Therefore, no mechanism by which project activities could extensively affect natural resources or sensitive species or habitats has been identified.

- 5 Management of radioactive wastes generated by medical isotope production would occur in existing facilities that also manage wastes from other operations. In the INEL and LANL alternatives, these facilities are onsite, whereas SNL/NM and ORNL would transport their radioactive waste to the Nevada Test Site (NTS) for disposal. Because these facilities already exist, addition of the relatively small quantities of medical isotope production waste would not require new permits. If necessary, existing permits for these facilities would be updated to include the types of waste resulting from medical isotope production.
- 6 Dispersion of air emissions would depend on atmospheric conditions at the time of the release. The probability that the wind would blow in any given direction is reflected in the wind rose diagrams presented in Appendix D of the EIS and in the joint frequency data used to estimate dispersion of facility emissions (see Appendix C). In the case of routine emissions from facilities, which are assumed to be nearly continuous, the dispersion patterns would correspond closely to the frequencies of annual average wind directions. For accidental releases that occur over a relatively short period of time, dispersion could occur over a much narrower area. For purposes of the EIS accident analysis, the wind was assumed to blow in the same direction for the entire duration of the event, and the direction was chosen to maximize consequences to the potentially affected population.

Sensitive natural resources such as threatened or endangered species and habitats, wetlands, and aesthetic and scenic areas are identified in Section 4 of the EIS for each of the alternatives. The types, relative number, and locations of such resources are identified in the appropriate sections for each site. Because the impacts of the proposed activities are very low for all types of resources, the potential for adverse effects on any of the above-mentioned resources is extremely unlikely.

The consequences of radioactive air emissions from medical isotope production were evaluated for onsite non-involved workers, who are among the most sensitive of onsite biota, and were found to be very small for both routine operations and accidents. Therefore, exposures to other types of biota would not be expected to result in adverse consequences. Although it would not be possible to entirely rule out potential impacts on some individuals of other biotic species following an accident, the relatively low human risk provides reasonable assurance that large populations of other onsite biota would not be subjected to detrimental effects. Estimating the environmental impacts to such individuals or populations would likely be of little value in forming a basis for making decisions among the alternatives.

- 7 The first reference in question, *Nonnuclear Consolidation Environmental Assessment, Volume 1: Nuclear Weapons Complex Reconfiguration Program*, contains a section (4.1.5.5) on biotic resources of SNL/NM and Kirtland Air Force Base (KAFB). This section cited the following references:

Sandia National Laboratories Albuquerque, Environmental Baseline Update, 301182-56-01, prepared by IT Corporation and Consensus Planning, Inc./Zephyr Design, 1992.

Revision of the Species Inventory Checklists for Sandia National Laboratories, Albuquerque, Bernalillo County, New Mexico, Final report, SAND90-7098, prepared by N.T. Fischer, IT Corporation, Albuquerque, NM, 1990.

Section 4.1.9.2 of the EIS describing aquatic resources has been revised and contains an additional reference.

- 8 Section 4.1.9.2 has been rewritten to reflect more accurate information about surface water resources at SNL/NM. In *Revision of Species Inventory Checklists for Sandia National Laboratories, Albuquerque, Bernalillo County, New Mexico: Final Report*, (Fischer 1990), Fischer states that there are three springs on KAFB which provide small areas of natural wetlands. He reports areas of shallow standing water and permanently moist soils. The *Draft Environmental Assessment of the Environmental Restoration Project at Sandia National Laboratories/New Mexico* DOE/EA-1140 (DOE 1995h), states that there are two perennial springs in the Arroyo del Coyote drainage: Coyote Springs and Sol se Mete Spring. These springs provide limited and localized wetland habitat at the site.
- 9 The discussion of wetlands in Section 4.1.9.3 has been revised. A wetland inventory of SNL/NM has been conducted by KAFB. Some riparian woodland and riparian scrubland is found in some arroyos and canyons with permanent or intermittent surface water sources. Species found in these areas include cottonwoods, saltcedars, cattails, rushes, and wetland grasses. Some artificial ponds also provide wetland-like habitats. These ponds may be used by migratory waterfowl in the spring and fall.

- 10 The reference in question is "DOE 1993a." In addition, *Revision of the Species Inventory Checklists for Sandia National Laboratories, Albuquerque, Bernalillo County, New Mexico, Final Report* also states that no federally listed threatened or endangered species are known to occur on KAFB. The citation has been added to Section 4.1.9.4.
- 11 The nature of the activities proposed in the EIS is such that the opportunity for impact on natural resources is minimal. Air emissions consist largely of short-lived noble gases, which ultimately decay to nonradioactive or lower activity isotopes and do not tend to accumulate in the environment. Effluent releases to soil or surface water are not expected from any of the processes other than waste disposal activities, which would take place in engineered facilities permitted by Federal and state agencies.

Transportation associated with the medical isotope project would utilize existing infrastructure at all sites, therefore no sensitive habitats would be affected by construction of roads or other utilities. Emissions from vehicle traffic associated with the proposed action would be minimal and do not represent a measurable increase over current levels. Therefore, no mechanism by which project activities could affect natural resources or sensitive species or habitats has been identified.

The consequences of radioactive air emissions from medical isotope production were evaluated for onsite non-involved workers, who are among the most sensitive of onsite biota, and were found to be very small for both routine operations and accidents. Therefore, exposures to other types of biota would not be expected to result in adverse consequences. Although it would not be possible to entirely rule out potential impacts on some individuals of other biotic species following an accident, the relatively low human risk provides reasonable assurance that large populations of other onsite biota would not be subjected to detrimental effects. Estimating the environmental impacts to such individuals or populations would likely be of little value in forming a basis for making decisions among the alternatives.

- 12 The nature of the activities proposed in the EIS, and their relatively low impacts as described in Section 5 of the document, is such that the likelihood for impact on natural resources is minimal. Both the New Mexico Department of Game and Fish and the New Mexico Minerals and Natural Resources Department were contacted for information on species of concern. Information on these resources was incorporated into the affected environment description for the SNL/NM site as appropriate.

Transportation associated with the medical isotopes project would utilize existing infrastructure at all sites, therefore no sensitive habitats or species would be affected by construction of roads or other utilities. Emissions from vehicle traffic associated with the proposed action would be minimal and do not represent a measurable increase over current levels. The relatively low impacts of incident free transportation, or of transportation accidents, on humans indicate that impacts on other types of biota (which are generally less sensitive than humans) would be minimal. Therefore, no mechanism by which project activities could extensively affect natural resources or sensitive species or habitats has been identified.

Transportation activities associated with medical isotope production would be undertaken in consultation with agencies governing potentially affected areas along the transportation routes. Routes would be chosen according to established guidelines to minimize risk, and emergency response plans would be developed in conjunction with local agencies as appropriate before shipments of radioactive materials commence.



GARY E. JOHNSON
GOVERNOR

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MARK E. WIEDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

February 15, 1996

Michael J. Zamorski
Acting Area Manager
Kirtland Area Office
Albuquerque Operations Office
U.S. Department of Energy
P.O. Box 5400
Albuquerque, N.M. 87115

Dear Mr. Zamorski:

RE: MEDICAL ISOTOPES PRODUCTION PROJECT; MOLYBDENUM-99 AND RELATED ISOTOPES; DRAFT ENVIRONMENTAL IMPACT STATEMENT; DOE/EIS-0249D; U.S. DEPARTMENT OF ENERGY, OFFICE OF NUCLEAR ENERGY, SCIENCE AND TECHNOLOGY, WASHINGTON, D.C.; DECEMBER 1995

The following provides New Mexico Environment Department (NMED) staff comments concerning the above-referenced Draft Environmental Impact Statement (DEIS).

A. DEIS ASPECTS RELATED TO SANDIA NATIONAL LABORATORIES (SNL).

1) Radioactive Waste Management Issues: Cit. §3.1.2, *Molybdenum-99 Separation Facility Needs*. It is indicated that during periods of uninterrupted ⁹⁹Mo supply from the current Canadian producer (Nordion, Ltd.), that all ⁹⁹Mo produced in the planned continuous USDOE operation would be disposed of as waste. I.e., although the medical market would not absorb the excess radionuclide, full production would continue. It is unclear from the DEIS how the addition of this radionuclide (and particularly its daughter product, ⁹⁹Tc, with a half-life of 21,300 years) to the waste stream would impact estimates of low level radioactive waste (LLW) generation rates in terms of volume, activity, or cost to the program. It is also unclear what the fate of ¹³¹I and ¹³⁵Xe (additional medical isotopes that would be produced in the irradiation process) would be in the event that the medical market could not absorb them. Annual volumetric waste estimates in the DEIS range variously from 42 m³ to 56.3 m³ (Cit. §3.3.1.8 and 5.14.1.1.). In a supporting document: "Environmental Assessment for Sandia National Laboratories/New Mexico Offsite Transportation of Low-Level Radioactive Waste" §2.1.2 (917ER), projections of future LLW generation are based solely on past generation rate at:

Michael J. Zamorski
February 15, 1996
Page 2

1 37 m³/year. Hence, the Transportation EA estimates would not include the impacts of the proposed MIPP. The DEIS estimate of 70.8 m³ LLW produced annually by SNL (Cit. §4.1.13.3) is apparently contradicted by the estimate in the supporting LLW Transportation EA.

2 Cit. §3.3.1.9, Hot Cell Facility Modifications. The Hot Cell Facility (HCF) has a history of use for destructive testing of irradiated fuel elements and other radioactive materials. In that operational mode, radioactive contamination of HCF components would be expected. Modifications to the HCF to permit medical isotope processing may include demolition and decontamination activities which are not discussed in the DEIS. Such activities would likely increase the initial radioactive waste inventory beyond that projected for medical isotope processing.

3 Cit. §4.4.14.4, Low-Level Mixed Waste. The section indicating that mixed wastes may be generated at SNL as a result of weapons tests requires clarification. We are unaware of nuclear weapons tests being performed in New Mexico with the exception of the historic AEC Trinity Site detonation, and historic ERDA detonations of nuclear devices at the Gnome Site (Carlsbad) and Gasbuggy Site (Four Corners) under Project Plowshare.

4 2) Structural Seismic Safety Issues: Cit. §3.3.1.9, Required Modifications - Annular Core Research Reactor Modifications at SNL/ANR. This section does not indicate any structural modifications necessary to bring the ACRR High Bay structure to current seismic safety building requirements. The ACRR High Bay is an unreinforced masonry (URM) structure (Draft Environmental Assessment, Gamma Irradiation Facility at Sandia National Laboratories, September 1995 - DOE/EA-0973), which is not considered seismically sound under the 1991 Uniform Building Code (UBC) for Seismic Hazard Zone 2B that includes Albuquerque, NM. This also holds for subsequent editions of the UBC. The USDOE Defense Programs Information Letter 95-03 advises re-evaluation of URM structures for natural phenomena hazards including earthquakes. The President's Executive Order 12941 mandates adoption of ICSSC Standards as minimum safety standards; ICSSC RP-4 (National Institute of Standards) and DOE Order 5480.28 trigger seismic risk evaluation of any building where a major change in function, building modification, or change in consciousness of risks occur. The change in operation mode of the ACRR from occasional pulsed operation for testing purposes to continuous, around-the-clock production of irradiated targets, as well as conversion of the HCF to isotope processing, implies a major change in facilities function. It is not clear from the DEIS whether a site specific seismic risk evaluation has been performed for the ACRR or other

Michael J. Zamorski
February 15, 1996
Page 3

DOE Performance Category 3 nuclear facilities at SNL Technical Area V (TA V).

Cit §4.1.6, *Geologic Resources*, §4.1.6.1, *General Geology*, and §4.1.6.3, *Site Stability*. These sections of the DEIS refer to a supporting document "SNLA (1993d)", which was not included in the list of references.

Cit §4.1.6.3 *Site Stability*. This section refers to a range of horizontal accelerations due to seismic events in units of "grams". This should be corrected; the unit "g" refers to an acceleration value equivalent to the acceleration of gravity on earth (9.8 m/s^2). The unit gram refers to mass which is, by definition, independent of the force of gravity. The numerical values for horizontal acceleration (0.07 g to 0.3 g) derived from the 1991 USC are not accurate for the Albuquerque area and thus underestimate potential seismic risks for the proposed MIPP facility. Predicted maximum vertical and horizontal accelerations in the Albuquerque region are 0.3 g and 0.5 g, respectively (Algermissen-USGS, 1990). Based on the extents of the Tijeras-Cañoncito fault system and the Sandia accommodation zone located within a mile of the site, a maximum credible tremor of 7.5 Richter magnitude is indicated. This value is greater than that indicated by the DEIS, and greater than values associated with the recent destructive earthquakes at Northridge, CA and Kobe, Japan. Recent evidence indicates that the region between Socorro, NM, and Albuquerque, NM, may produce a tremor with Richter magnitude as high as 6.4 within the next 25 years, with a probability of 0.15 to 0.3 (Sanford, NMIMT 1995). This information is available in the juried literature, constitutes a change in the consciousness of risk, and should be updated for all alternatives considered in the DEIS.

3) *Biological Resources Issues*: Cit. §4.1.9.4, *Threatened and Endangered Species*. This section refers only to special status species, indicating that poor quality habitat at KAFB renders occurrence of endangered species unlikely. This statement is not apparently supported by any local survey efforts, which should be completed before such a conclusive statement is made. The endangered peregrine falcon (*Falco peregrinus*) is known to nest in the nearby Sandia Mountains, and 44 migratory peregrine falcons were noted in 1995 by Raptor Watch at the Manzano watch area adjacent to KAFB. Foraging ranges of up to 10 miles are expected for the peregrine falcon. Potential impacts to special status species and their prey species, including any potential for bioaccumulation of radioactive materials from MIPP airborne or waterborne effluents, are not discussed under §5.0 *Environmental Consequences* which summarily dismisses "substantial effects" to any ecological resources.

Michael J. Zamorski
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8 4) Radiological Air Effluent Impacts: Cit. §4.1.12.1, Current Radiological Environment. This section correctly identifies the Maximally Exposed Individual (MEI) for radiological air emissions dispersion modelling under 40 CFR 61 Subpart H (NESHAP) at 1600 m northwest of TA V. However, this MEI was disregarded in the discussion of potential radioactive air emissions impacts under §5.7, Air Impacts, using instead an MEI at 5400 m north, in the region of SNL Technical Area 1. The effect of using this MEI, and emissions estimate data (Table 5-4) which do not agree with that used by SNL Air Quality in reporting to the USEPA, is to underestimate the potential radiation dose equivalent impact as 0.17 mREM/y. SNL reporting to USEPA and Albuquerque Environmental Health (AEH) indicates a radiation dose equivalent estimate to the MEI of 5.2 mREM/y, over half of the USEPA allowed standard. Dispersion modelling performed by SNL was repeated by NMED using the emissions estimates supplied to USEPA and AEH, the meteorological data used for 1994 NESHAP reporting to USEPA, and estimates of target production from the DEIS. The resulting value found was 8.6 mREM/y for production of 100% of the United States medical community's demand for ⁹⁹Mo. While this modelling result nearly approaches the NESHAP standard of 10 mREM/y, supplying 200% of the current demand to meet projected future needs would result in emissions that are clearly not in compliance with the regulatory standard. USDOE and SNL have been advised of these findings.

9 Cit. §5.15.1.3, Facility Accidents for Target Irradiation at the Annular Core Research Reactor. This section refers to modelling performed in the Draft Environmental Assessment for the MIPP which preceded the DEIS. This modelling was performed to predict the results of an accident scenario involving an acute, high level exposure with limited or no emissions controls. The model used again was the EPA's CAP88PC, which is specifically designed to model chronic, long-term, low-level exposure to radioactive effluents from normal facility operations. Using CAP88PC to model an accident scenario is therefore inappropriate, and will underestimate the resultant acute radiation dose to members of the public.

B. DEIS ASPECTS RELATED TO LOS ALAMOS NATIONAL LABORATORY (LANL).

10 1) Cit. §3.3.2.9, Page 3.38, Required Modifications. While it is true that the cooling water leak at the Omega West Reactor (OWR) reactor has been stopped, it is unclear what remediation activities have taken place since the leak was discovered. A comprehensive report of the extent of surface and subsurface contamination and the remediation activities completed to date should be included in the DEIS in order to make a reasonable determination concerning the

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10 re-starting of the reactor. Additionally, for the Omega West Reactor/Chemistry and Metallurgy Research Facility Alternative, the NMED staff recommends that OWR safeguards be installed to prevent future releases from underground piping--such as water flow rate instrumentation with alarms that would detect water loss and notify process control technicians. Other reactor hardware upgrades described in the DEIS should be clarified further.

11 2) Cit. §4.2.6.3, Page 4.29, Site Stability. The text mentions that the Pajarito Plateau is dominated by three prominent fault zones, but fails to acknowledge that the trace of the Guaje Mountain Fault passes directly through the cooling towers of the OWR at TA-2. Has the Guaje Mountain Fault been sufficiently characterized--in the event OWR is re-started--to remove it as a contaminant transport mechanism for perched ground water systems below the facility during the proposed accelerated OWR operations?

12 3) Cit. §4.2.8.1, Page 4.35, Surface Water. The first paragraph is incorrect, permanent perennial surface waters are found at LANL in Cañon de Valle, Twomile Canyon, and Pajarito Canyon (Dale and Yanicak 1995, in review). We should also note that NMED staff observed perennial surface water flow in Threemile Canyon and upper Water Canyon during 1994 and 1995. In addition, there are springs in many of the canyons on the eastern border of the Pajarito Plateau which supply perennial surface water flow to the Rio Grande, notably Frijoles, Anchb, and Pajarito Canyons.

It would be appropriate to display the summer storm runoff data mentioned in paragraph two.

It is not well understood how surface water flow affects the perched ground water (alluvium) in Los Alamos Canyon (e.g., infiltration and percolation rates have not been characterized near the OWR).

The LANL ER Project has shown that there is radionuclide contamination in the perched ground water (alluvium) east of the OWR from past operational releases, but little data have been collected to evaluate how other potential release sites (PRS) in the Los Alamos Canyon and DP Mesa area contribute to the overall contaminant and radionuclide inventory down-gradient of the OWR. NMED staff recommends for the Omega West Reactor/Chemistry and Metallurgy Research Facility Alternative that snow-melt and storm water events be continuously monitored to pinpoint and assess all PRS sources to Los Alamos Canyon. A storm water pollution plan should then be designed and implemented to prevent all contaminants from leaving the site.

Surface waters fed by the Los Alamos reservoir often reach and

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extend beyond the OWR.

4) Cit. 54.2.8.2, Page 4.35, Groundwater. It should be noted that an intermediate perched ground water zone probably exists in the subsurface below the OWR, and it is unknown whether there is a connection between the upper shallow alluvium aquifer and this deeper perched zone that would allow for the transport of contaminants. NMED staff recommends that an adequate characterization of these aquifers be performed for the Omega West Reactor/Chemistry and Metallurgy Research Facility Alternative.

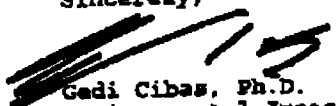
The existence of perched alluvium ground water in Los Alamos Canyon beneath the OWR was brought to Department staff attention by LANL ER Project personnel. In order to relieve pressure caused by upwelling of ground water in the canyon alluvium, it was necessary to drill holes in the basement floor of the OWR equipment room.

NMED staff believe that there is an inadequate site-wide ground water monitoring system at LANL. Department staff recommend that an intermediate perched and deep regional aquifer monitoring system in Los Alamos Canyon be funded and implemented if the USDOE is seriously considering the Omega West Reactor/Chemistry and Metallurgy Research Facility Alternative. The recommended ground water monitoring system could be addressed in a timely manner by implementing the LANL Ground Water Protection Management Program Plan (GWPMP).

5) Cit. 54.2.14.2, Page 4.46, Low-Level Wastes. Has there been a performance assessment of TA-50's current and future low-level radionuclide waste treatment capabilities (with all proposed upgrades) to address the Omega West Reactor/Chemistry and Metallurgy Research Facility Alternative? TA-50 is currently experiencing problems with the present site-wide radionuclide waste stream it processes. Will TA-50, a facility that still utilizes "sixties technology", be able to adequately address the increased waste stream from Moly-99 target preparation and target dissolution?

We appreciate the opportunity to comment on this document. Please let us know if you have any questions.

Sincerely,


Gedi Cibas, Ph.D.
Environmental Impact Review Coordinator

NMED File No. 958ER



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DEPUTY SECRETARY

February 16, 1996

Michael J. Zamorski
Acting Area Manager
Kirtland Area Office
Albuquerque Operations Office
U.S. Department of Energy
P.O. Box 5400
Albuquerque, N.M. 87115

Dear Mr. Zamorski:

RE: MEDICAL ISOTOPES PRODUCTION PROJECT; MOLYBDENUM-99 AND RELATED ISOTOPES; DRAFT ENVIRONMENTAL IMPACT STATEMENT; DOE/EIS-0249D; U.S. DEPARTMENT OF ENERGY, OFFICE OF NUCLEAR ENERGY, SCIENCE AND TECHNOLOGY, WASHINGTON, D.C.; DECEMBER 1995

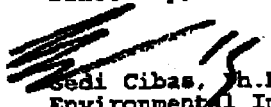
We discovered an error and would like to amend two sentences in our February 15, 1995, comments on the document referenced above. The last two sentences (i.e., sentences (6) and (7)) of the first paragraph of section A(4), entitled Radiological Air Effluent Impact, should be changed as follows:

Sentence (6): the "100Y" should be replaced with "200Y".

Sentence (7): the entire sentence should be deleted and replaced with the following: "This modelling result nearly approaches the NESHAP standard of 10 mREM/y."

The remainder of our comments is otherwise unaffected. We regret the inadvertent inaccuracy. Please let me know if you have any questions.

Sincerely,


Gedi Cibas, Ph.D.
Environmental Impact Review Coordinator

NMED File No. 958ER

Responses to Comment Letter C097

- 1 If the Department decides to pursue this project, it would only produce Mo-99 at full capacity in the event of a Mo-99 supply shortage. At all other times, it would operate under its normal backup mode and would only produce enough Mo-99 to maintain the capabilities of the facilities and staff to respond to a Mo-99 shortage.

In this backup mode, the Department would attempt to sell all of the Mo-99 and related isotopes (xenon-133 and iodine-131) that it produced. There may be times, however, when the Department would be unable to sell all of the isotopes and would have to dispose of them as waste. If Mo-99, iodine-131, and xenon-133 were disposed of as waste, they would not add substantially to the volume, activity, or cost of waste disposed. All are short-lived radionuclides that decay to nonradioactive or very low activity isotopes and could be incorporated into the normal process waste streams. The waste generation figures presented in Section 5.14 take into account the potential need to dispose of unsold isotopes.

Although the SNL/NM low-level waste transportation EA apparently did not account for disposal of medical isotope project waste, this waste disposal effort is analyzed as part of the transportation analysis in Section 5.11 of this EIS.

- 2 The impacts from modification to the facility are considered in the EIS. Cleanout of the facility to remove contamination from previous programs is an ongoing process and is not considered part of proposed activities for the SNL/NM alternative.
- 3 The text has been clarified to eliminate any confusion (see Section 4.1.14.4).
- 4 As noted in the comment, the Annular Core Research Reactor (ACRR) High Bay is an unreinforced masonry structure which does not satisfy current Uniform Building Code (UBC) requirements for a seismic Hazard Zone 2B. The ACRR High Bay was constructed in the 1960s and satisfied building criteria at that time. Modifications to the structure in 1978 also satisfied the UBC current at that time. In the safety documentation for the ACRR, it has been demonstrated that the High Bay structure is not a safety class item. As noted in the comment, major changes in the facility's function is a potential trigger to performing a seismic safety evaluation. This has recently been completed for the ACRR and is being reviewed as potentially an Unreviewed Safety Question (USQ) both by Sandia Reactor Safety committees and by DOE. This USQ identifies the Performance Category for all safety-related systems, subsystems and components (SSCs) for the ACRR. The USQ proposes that all safety-related SSCs for the facility are Performance Category 2 (PC-2). As a PC-2 structure, the high bay satisfies the criteria stated in DOE Order 5480.28 and the corresponding DOE Standards 1020 through 1023. Modifications to the ACRR facility would be designed and constructed in compliance with the current UBC and DOE Order 5480.28.

The Hot Cell Facility (HCF) Safety Analysis Report, which is currently being reviewed by DOE, includes a seismic safety evaluation based on DOE Order 5480.28. In the evaluation, safety-related SSCs are identified as Performance Category-2 and Performance Category-3 (PC-2 and PC-3) systems consistent with the definitions of these categories.

- 5 The reference section has been revised to add supporting document SNLA (1993a).

SNLA. 1993a. *Site-Wide Hydrogeologic Characterization Project, CY 1992 Annual Report*. Sandia National Laboratories, Environmental Restoration Programs, Albuquerque, New Mexico.

- 6 The seismic requirements for the nuclear facilities at SNL/NM are derived from DOE Order 5480.28 "Natural Phenomena Hazards Mitigation" and corresponding DOE Standards 1020 through 1023. The order and standards set forth a probabilistic, rather than deterministic, evaluation for seismic risks that is based on three factors: 1) the magnitude and probability of seismic activity, 2) the local seismic response curves, and 3) the performance category of safety-related SSCs. The criteria stated in the order and standards are derived from Uniform Building Code (1991) and UCRL 53582, Rev 1, 1984 (*Natural Phenomena Hazards Modeling Project: Seismic Hazard Models for Department of Energy Sites*, University of California Research Laboratory, Livermore, California). The updated safety documentation for the ACRR and HCF, which is currently being reviewed by SNL/NM and DOE, identifies safety-related equipment by performance category for evaluation to the following criteria:

Performance Category	Probability of Activity (1/yrs)	Maximum Horizontal Ground Acceleration (g)
PC-1	2×10^{-3}	0.17
PC-2	1×10^{-3}	0.22
PC-3	5×10^{-4}	0.28
PC-4	1×10^{-4}	0.47

For the ACRR, the proposed performance category for all safety-related SSCs is PC-2; and for the HCF, the proposed performance category of safety-related SSCs is PC-3 and PC-2.

The seismic magnitudes and probabilities cited in the comment are single points in a continuous seismic risk curve which has been incorporated in the DOE Orders and Standards.

- 7 The Department requested location-and species-specific lists for each alternative from the Department of Interior Fish and Wildlife Service and from each state. In addition, surveys of Kirtland Air Force Base (KAFB) have been conducted recently by N.T. Fischer of IT Corporation, *Revision of the Species Inventory Checklists for Sandia National Laboratories, Albuquerque, Bernalillo County, New Mexico, Final Report*, SAND90-7098, (Fischer 1990). This report states that no federally listed threatened or endangered species is known to occur on KAFB. DOE believes that any airborne or waterborne effluents are not likely to affect nearby biotic resources because of the low-level of chemical and radiological releases.
- 8 The distance used for the offsite receptor evaluation at SNL/NM represents the location of a full-time resident who receives the highest potential exposure to facility emissions. In some cases, meteorological conditions result in the maximum offsite receptor location being other than the nearest possible access point. Also, other locations to which the public has access may not be residential areas, and the exposures at these locations would be substantially lower than at a permanent residence because they are not continuously occupied.

The location typically used for permitting and compliance calculations at SNL/NM (1610 m NW) is within the KAFB boundary. This location is not a full-time residence and would not be accessible to the general public and, therefore, was not used in this EIS as the location of the maximally exposed individual. The 1610 m NW location was, however, used in the EIS to calculate the dose for an onsite worker (see Table 5-3 and Table C-1 in Appendix C).

The maximum production level for the EIS was assumed to replace 100% of the U.S. supply, rather than the 200% assumed in earlier SNL/NM documentation. Other assumptions used for the EIS analysis account for

proposed modifications to the reactor and hot cell facility and rely on a long-term meteorological data set appropriate for this type of prospective analysis. These assumptions are listed in Appendix C as well as in Section 5.7.1 of the EIS.

- 9 The facility accident analyses performed for the EIS did not use CAP-88 results from the earlier environmental assessment prepared by SNL. Only the descriptions of the design basis accident and the estimated releases were used; the consequences of these events were re-evaluated for the EIS analysis.

The atmospheric dispersion and food chain models in the GENII code, which was used for the EIS analysis (see introduction to Section 5.15), were specifically designed to be appropriate for short-term accidental releases and generally provide conservative estimates for the consequences of such events.

- 10 Aggressive remediation activities have been undertaken. Repair of the pipe is not considered to be a technical obstacle to reactor restart. The work was included in the Omega West Reactor (OWR) budget and schedule and the Department believes the figures are reasonable. Two studies have been conducted by LANL that review and analyze the OWR leak cause and remediation. These reports are: *Phase I: OWR Reactor Coolant Loss, Diagnosis, and Surveillance*, and *Stress-Assisted, Microbial-Induced Corrosion of Stainless Steel Primary Piping and Other Aging Issues at the Omega West Reactor*.

It is unclear how flowrate instruments could detect a leak, other than a very major leak. Flowrate instruments are rarely better than 1% accurate at full span, and the accuracy decreases as the square of the ratios of the flows, making flowrate instruments poor for leak detection purposes. Normally leakage is detected through a mass balance, basically tracking makeup versus letdown plus evaporation rate. This type of procedure currently exists at the OWR, but an adequate procedure was not in place to perform this mass balance when the leakage occurred. The DOE has confidence that LANL has and will take actions to assure that a second leak would not go undetected.

- 11 Groundwater contamination is not expected to be a significant problem with operation of the OWR, regardless of the location of the fault referred to in the comment. The cooling tower would not normally contain radioactive materials because its water inventory is separated from the primary cooling loop in the reactor, and no other radioactive liquid effluent is associated with normal operation of the OWR.

A reasonably foreseeable accident scenario for liquid releases from the reactor cooling system assumed transport conditions much more direct than leaching into the groundwater via a fault and resulted in minimal impact on any potentially exposed individuals. Therefore, presence of the fault is not expected to increase the risk of operating the OWR beyond those presented in the EIS. The geologic characteristics of the area would be accounted for in a comprehensive safety analysis before the OWR is restarted.

- 12 DOE policy prohibits the citation of documents currently in review. All material must be available in approved released documents. Section 4.2.8.1 has been rewritten to agree with the recently developed surface water information found in the DARHT EIS (see Section 4.2.8.1 for the complete reference citation).
- 13 Groundwater contamination is not expected to be a significant problem with operation of the OWR. The cooling tower would not normally contain radioactive materials because its water inventory is separated from the primary cooling loop in the reactor, and no other radioactive liquid effluents are associated with normal operation of the OWR.

A reasonably foreseeable accident scenario for liquid releases from the reactor cooling system assumed transport conditions much more direct than leaching into the groundwater, and it resulted in minimal impact on any potentially exposed individuals. Therefore, the potential communication between groundwater aquifers is not expected to increase the risk of operating the OWR beyond those presented in the EIS.

The geologic characteristics of the area would be accounted for in a comprehensive safety analysis before the OWR was restarted. The need for additional groundwater monitoring would be addressed as part of permitting the facility restart by Federal, state, and local authorities, as applicable.

- 14 The aqueous waste volume from the Chemistry and Metallurgy Research (CMR) building would not be increased significantly from the proposed target preparation and target processing. There would be a small volume of aqueous waste going to TA-50 from the target fabrication line, but the metal concentrations are quite low and below discharge limits. There would be no aqueous waste from target processing. It would all leave CMR as low-level radioactive solid waste.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Mr. Wade Carroll, EIS Project Manager
 Medical Isotopes Production Project
 U/S Department of Energy
 19901 Germantown Road
 Germantown, MD, 20874-1290

Food and Drug Administration
 Rockville MD 20857
 2094 Gaither Road

February 7, 1996

Dear Mr Carroll:

In response to the letter to Dr Bruce Burlington, Director CDRH/FDA by Ms Carol M. Borgstrom, Director of NEPA Policy and Assistance, dated December 13, 1995 in relation to DOE's Draft "Medical Isotopes Production: Molybdenum-99 and Related Isotopes Environmental Impact Statement (DOE/EIS - 0249D)", we are happy to submit the following general comments:

1. The Environmental Impact Statement (DOE/EIS 0249D) is quite thorough and provides adequate information in relation to possible radiation emergencies concerning public health safety. We will not respond to technical aspects of the statement. All alternatives are capable of adequate production of Mo-99 and meet radiation protection standards.
2. Budgetary considerations and time constraints are solely DOE's concern. However other priorities should not interfere and become obstacles to the Medical Isotope Production Project.
3. The single Canadian source of Mo-99 cannot indefinitely be assumed to produce without interruptions medical radioisotopes to satisfy the needs for 38,000 daily nuclear medicine procedures in the USA. Any nuclear reactor based production facility could have regular or emergency shut downs. We believe that the time is ripe for a government supported production facility of Medical Radioisotopes in USA.
4. The need for uninterrupted availability of Mo-99 is obvious. Most of the nuclear medicine diagnostic procedures are performed with Tc-99m tagged radiopharmaceuticals. Some of these procedures are essential for proper diagnosis, others offer preferable not invasive or cost effective alternatives. This is a well known fact and need not to be further emphasized. The concern of the medical community for a back-up production facility is serious and well justified. We are glad you are taking positive steps to materialize a satisfactory response to such concerns.

We hope and expect a successful conclusion of this project.

Finally we would like to thank you for the opportunity to offer our comments.

Sincerely

Peter Paras Ph.D., FACNP
 Assistant Director for Nuclear Medicine
 Center for Devices and Radiological Health

Response to Comment Letter C098

- 1 Comment noted.



Henry H. Kramer, Ph.D., FACNT
Executive Director

20 February 1996

Mr. Wade Carroll
MIPP-EIS Document Manager
U.S. Department of Energy, NE-70
19901 Germantown Road
Germantown, MD 20874

Dear Mr. Carroll:

CWS/011/96

The Council on Radionuclides and Radiopharmaceuticals* (CORAR) has reviewed the Department of Energy's (DOE) draft Environmental Impact Statement (EIS) and the implementation plan for the medical isotope production project: Molybdenum-99 and related isotopes. We would like to first commend Secretary O'Leary and her staff for all their efforts on this matter, as well as their support of the nuclear medicine community.

As you know, we have been working with DOE for more than six years in an effort to address the Mo-99 supply situation, to ensure the success of the DOE's Isotope Production and Distribution Program (IPDP), and meet the needs of the nuclear medicine community. Last January members of CORAR attended a workshop at the Sandia National Labs to seek to develop a plan that would address the vulnerability of the Mo-99 supply and allow DOE, in spite of delays, to ensure a return on their investment. Our recommendation then, which remains our position, was for DOE to enter into a cooperative effort with the nuclear medicine community and the current Canadian supplier of Mo-99. Under this plan DOE would ultimately supply "raw or semi-processed" Mo-99 to Nordion International for final processing, which would solve the nuclear medicine community's need for a back-up supplier of Mo-99, and allow DOE to enter the marketplace and see a much earlier return on its investment.

The potential supply shortage is not a new problem and the radiopharmaceutical manufacturing industry is hopeful that other efforts to address the lack of a secondary North American reactor to supply Mo-99 will be successful. One such effort is the program of the Canadian government and Nordion International to build two new reactors to supply Mo-99. These reactors are expected to be fully operational by the end of the decade. Assuming that the Canadian effort is successful, there still remains a critical need until these new reactors are on-line for a secondary reactor to supply Mo-99 in North America. The current North American supplier of Mo-99, Nordion, depends on an aging reactor at Chalk River, which may need maintenance or repairs that could cause it to go off-line at any time.

*CORAR is an industry of manufacturers of radiopharmaceuticals, radionuclides, radiochemicals and other radioactive products primarily used in medicine and life science research. The member companies of CORAR supply vitally important radiopharmaceuticals and radioactive material to physicians and research facilities throughout the world. Radiopharmaceuticals are used in over 10 million medical diagnostic and therapeutic procedures per year in the U.S.

CWS/011/96
Page 2

The current DOE project at Sandia will not likely produce finished Mo-99 as a pharmaceutical raw material until 1998, especially in light of the length of the EIS process. Further still, once the Sandia reactor is on-line DOE will have to file a DMP with the Food and Drug Administration (FDA) and the manufacturers will still have to validate three routinely manufactured lots, adding from one to two years from that point until the Mo-99 produced at Sandia could be used by manufacturers. In light of the delays in the DOE program and the time needed to obtain FDA approval, the IPDP program must refocus its sights and seek to come up with a way to supply material sooner. It is our view that this can only be accomplished by providing "raw, or semi-processed" Mo-99 to Nordion for final processing. This would allow the manufacturers to use the Mo-99 without having to undergo the time consuming validations required by the FDA or the filing of a DMF by the Sandia reactor facility. It would also allow routine maintenance to be done on the current Chalk River reactor in a more deliberate and effective basis.

We hope that you will find these comments useful to the EIS process. Please let us know if you require any further information.

Sincerely,



Carl W. Seidel (CWS)
Chairman, CORAR

CWS:npb

cc: R. Brown - Mallinckrodt
W. Ehlig - Amersham/Medi-Physics
H. Kramer - Executive Director
J. Massie - Alpine Group

Response to Comment Letter C099

- 1 Information for this option is presented in Section 5 and Appendix B of the EIS. The Summary has been revised to clearly indicate this option, and shipping container information has been added to Section 5.11.

Monday, February 19, 1996

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Mr. Wade Carroll, NEPA Document Manager
Office of Isotope Production and Distribution, NE-70
U. S. Department of Energy
19901 Germantown Road,
Germantown, Maryland 20874-1290 REF: DOE/EIS-0249D

Dear Mr Carroll:

1 After reviewing DOE/EIS-0249D, Draft EIS for the Mo-99 reactor, I
feel my letter of January 1st is not addressed. I request my comments be
included in your final document, and an appropriate response.

2 I also would like to ask for your evaluation of another difference
some of us have with the DOE on radiation and public health. Your reviews
always come to the conclusion there is no immediate danger to the public
from the present radiological hazards and therefor more is allowable. Of
course, some of us feel we have gone past the safe limit already. The
problem is much of this is not easily provable, either way.

So, I would like for the DOE, EPA, or the appropriate agency, to
produce a study estimating from the present radionuclide and toxic
hazards present at Sandia National Lab and Los Alamos National Labs (and
all other DOE nuclear facilities) and expected future increases from
increases operations when we would cross a threshold to which public
health would be endangered. Please include what expected consequences
such a crossing would cause and how it would appear in the public and
environment.

Sincerely,



Robert L. Anderson

Responses to Comment Letter C100

- 1 The January 1 letter referred to and reproduced as comment letter C003 in this document, was received after publication of the Draft EIS. That letter has been considered in the preparation of the Final EIS.
2. The risk of radiation-induced health effects has been exhaustively studied over many years by the International Commission on Radiological Protection (ICRP), an international group of experts that does not represent the interests of DOE or any other particular government agency. In its latest set of recommendations, the ICRP estimated risks for many types of radiation-induced health effects, based primarily on studies of Japanese survivors of the atomic weapons detonations at Hiroshima and Nagasaki (ICRP 1991). Other types of radiation exposure, largely for medical purposes, were also considered where they were appropriate for evaluating a specific type of health effect. One difficulty with this analysis is that the study populations were exposed at doses and dose rates much higher than those observed in any environmental setting. However, because of the large size of these populations and the fact that they represent actual exposures of humans of all ages and both genders, these data are the best available for estimating potential human health effects from environmental exposure levels as well. Studies of humans at environmental radiation exposure levels have not produced any direct evidence of radiation-induced health effects, even in populations where the environmental exposure levels are much higher than average. The ICRP concluded that its risk estimates for human health effects of radiation exposure at environmental levels, based on available data from Japanese survivors and medical exposures, "are unlikely to underestimate the risks" (ICRP 1991).

Latent cancer fatalities are most commonly used as an indicator of potential radiation health effects because they are estimated to occur at lower doses than other types of effects and therefore represent one of the most sensitive indicators of any potential effects. The ICRP (1991) study estimated that the lifetime risk of all latent fatal cancers following radiation exposure to the general population is 4×10^{-2} per Sv (or 4×10^{-4} per person-rem). This means that a large population consisting of all ages would be expected to experience, at most, 1 latent fatal cancer during the lifetimes of all exposed individuals following a collective radiation dose of 2000 person-rem. As noted previously, this estimate is expected to be conservative (i.e., to overestimate the actual risk rather than to underestimate it). However, it is generally accepted by most U.S. and international agencies as the standard for radiation protection purposes at the exposure levels experienced in environmental and occupational settings. The uncertainties associated with this estimate are such that the risks of radiation exposure from medical isotope production, which are reported in this EIS as a finite probability of experiencing cancer fatalities, may actually be zero.

The average individual in the U.S. receives a radiation dose of approximately 300 mrem per year from natural background sources and another 60 mrem per year from artificial sources, largely medical exposures. The collective radiation dose to the U.S. population is therefore about 95 million person-rem per year from these sources. In contrast, air emissions from all DOE facilities in the U.S. currently result in collective doses to the surrounding population of about 100 person-rem per year. Based on the ICRP (1991) estimate, this represents a dose 20 times lower than that required to produce, at most, 1 fatal cancer in the entire U.S. population. Air emissions from the proposed Medical Isotopes Production Project could increase the cumulative total radiation dose from all DOE facilities by 0.7 to 15%, depending on the alternative chosen. Any potential increase in cancer death rates from these exposures would never be observable within the existing U.S. cancer fatality rate of over 500,000 per year. These small potential risks must also be balanced with the very real and immediate risk of not having a reliable supply of widely used medical isotopes which substantially improve the quality of health care in the U.S.



NUCLEAR ENERGY INSTITUTE

Felix M. Killar, Jr.
DIRECTOR, MATERIAL
LICENSES PROGRAMS

February 22, 1996

Mr. Wade Carroll
MIPP-EIS Document Manager
U.S. Department of Energy, NE-70
19901 Germantown Road
Germantown, Maryland 20874

SUBJECT: Medical Isotopes Production Project:
Molybdenum-99 and Related Isotopes
Draft Environmental Impact
Statement 60 *Federal Register* 66542

Dear Mr. Carroll:

1 | The Nuclear Energy Institute (NEI)* has reviewed the draft Environmental Impact Statement (EIS) and the implementation plan for the medical isotope production project: Molybdenum-99 and related isotopes. NEI endorses the underlining Department of Energy (DOE) concept of providing Mo-99 if the Canadian source becomes unavailable.

2 | We do, however, have some reservations with DOE's approach to addressing this potential problem. The DOE has indicated that it would like to be a Food and Drug Administration (FDA) approved supplier of Mo-99. An important omission in the draft EIS is the timing of the FDA's approval of a new source of Mo-99. Our best estimate would be at least one year to 18 months following full production. The draft EIS is silent on this time-sensitive point. As proposed, the DOE program, with FDA approval, will only be coming into full production in the 1998 time period.

The draft EIS correctly noted that a reliable source will only be available with two operating reactors. It is feasible to have one in the United States and one in Canada, or perhaps two in Canada. Until then the medical community is at risk.

* NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

Mr. Wade Carroll
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3 We are concerned with the potential supply gap between now and 1998 when either the first new Canadian reactor comes on line or DOE receives its FDA approval for Mo-99. The supply of Mo-99 continues to be vulnerable with a single reactor as its source. We believe that the DOE can address this concern about a reliable Mo-99 source during the 1996 to 1998 time period by pursuing the alternative outlined below.

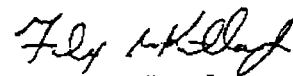
We would propose that DOE enter into an agreement with AECL or Nordion to be the backup supplier of irradiation service. The intent would be that the DOE program would irradiate targets (either DOE or Nordion supplied), process the irradiated target and return the raw Mo-99 to AECL/Nordion for final processing which would use Nordion's FDA approval for getting the Mo-99 to the market. As proposed in the EIS, DOE could irradiate the targets in the Annular Core Research Reactor, process the irradiated targets at Sandia National Laboratories and return the raw Mo-99 to AECL/Nordion for final processing.

4 We agree with DOE that the Annular Core Research Reactor is the best alternative for producing the Mo-99. First, it is the only alternative that utilizes an operating reactor. Second, it has a potential defense mission that helps assure that it will be operable during the 1996-1998 time period. Finally, the Annular Core Research Reactor would have the least lag time to provide this service. We would like to be assured that at a minimum an irradiation facility and initial processing of target facility is available.

5 In parallel with supplying raw Mo-99 to Nordion, DOE, with the industry's support, should be proceeding with its FDA approval. This dual approach would address the near term issue of having a second reactor to supply irradiated targets in the event the Canadian reactor were to be forced off line, and it would address the longer term issue of a second source in the event of continuing delays in the Canadian program. It has the added benefit of providing an outlet for the raw Mo-99 which will be produced at some nominal level during the FDA approval process and therefore provide revenue to offset some of the expenses during this time period.

In summary, we agree with DOE's intent to increase the reliability of supply of Mo-99. We believe, however, that this goal could be better accomplished by pursuing the dual path alternative describe in these comments as opposed to the alternatives contained in the draft EIS. If you have any questions concerning NEI's comments or would like assistance from the industry pursuing the alternative proposed in this letter, please contact me at (202) 739-8126.

Sincerely,


Felix M. Killar, Jr.

Responses to Comment Letter C101

- 1 Comment noted.
- 2 The Department has been in contact with the FDA regarding the time necessary to gain approval of its Mo-99 production process. Considering that the Department proposes to use a previously approved process for Mo-99 production, the FDA has indicated that the necessary time to obtain approval could be less than a year. The production schedules for the alternatives include the time estimated to be required to obtain FDA approval.
- 3 Information for this option is presented in Section 5 and Appendix B of the EIS. The Summary has been revised to clearly indicate this option, and shipping container information has been added to Section 5.11.
- 4 Comment noted. If the Annular Core Research Reactor (ACRR) is chosen for Mo-99 production, its mission would be changed from defense programs to medical isotope production.
- 5 Please see response to comment C101-3 above.

1 | Let me state my position clearly. I fully support the effort to produce medical isotopes at the Idaho National Engineering Laboratory.

2 | The Power Burst Facility can be started for significantly less cost than any other facility being considered in the Draft EIS.

3 | For too long this nation has relied on Canada and, to a lesser extent, Europe to supply the medical isotopes America needs. The time has come for this nation to take care of our own. I commend the Department of Energy for identifying this vital national need.

I am concerned, however, that the Draft EIS indicates that the DOE is only looking for back-up capability to provide 10% to 30% of the U.S. Mo-99 needs. In the Final EIS, the DOE should revise the objective and raise the standard. The goal should be to provide 100% of American needs, and maybe more.

4 | The case for this position, to provide for 100% of production needs, is clearly made by the Draft EIS. The document plainly states that if the Canadian Reactors were shut down, European sources could only provide a portion of U.S. demand. The statement also notes that until a back-up production facility is brought on line which is capable of producing 100% of American needs, our nation is vulnerable to an interruption in the supply of this important isotope.

The case is clear. The U.S. needs to have the capability for full production of these important isotopes. PBF can fulfill that need.

As the DOE looks to meet the needs of our nation, the Department should also look beyond our nation's border. It is not enough to just satisfy the needs of American customers. The DOE should also begin searching out foreign markets for this important American product. Now is the time to begin.

Responses to Transcript IDA01

- 1 Comment noted.
- 2 Please see response to comment C017-2.
- 3 Comment noted.
- 4 Please see response to comment C017-4.

1 The INEL has already made contributions to medical research. For instance, using the Power Burst Facility for Boron Neutron Capture Therapy, a break-through treatment for brain tumor patients with minimum patient trauma and cost. The production of medical isotopes, continuously needed in the U.S., offers the INEL another opportunity to play an important medical role for the nation.

2 Because of the INEL's critical nuclear expertise developed over 50 years, the INEL is the perfect and most logical location to produce these most important medical isotopes many patients in our nation need. Our country would benefit significantly from this vital program.

3 At present, the U.S. has only one source of supply of Mo-99. That source is Nordion International, which produces it at the aging NRU Reactor at Chalk River, Ontario. This reactor is just two years away from completing its 40-year design life. NRU not only supplies the entire U.S. market for Mo-99, it supplies 85% of the entire world market. The future of medical isotope production from NRU is in serious jeopardy. This threat is so serious I understand a company has obtained a license to upgrade a 45 megawatt reactor in the Netherlands, clearly a result of the uncertainty about the Canadian supply. This country obviously needs a domestic supply of these important medical isotopes.

4 Although there may be other Canadian reactors coming on line in the future for medical isotope production, it is vitally important that our nation have the capability to produce medical isotopes on our own. We cannot afford to continue our current vulnerability.

5 As noted in this Draft Environmental Impact Statement, our goal is to meet initial domestic production of only 10% to 30% of the nation's need. I believe we must move forward to assure we can produce 100% of our nation's medical isotope needs.

6 Today I will speak in support of the alternatives discussed in the Draft EIS that uses the facilities of the INEL.

7 The INEL offers the potential dual use of an existing reactor for medical isotope production and cancer therapy.

8 INEL offers unsurpassed expertise in reactor operations, existing reactors, and complete infrastructure support, Hot Cells and remote handling capabilities, expertise in handling and shipping spent nuclear fuels, among others, that can be adapted to the production of these isotopes.

9 I am perplexed that the Advanced Test Reactor is not considered in this DEIS. I suggest DOE consider ATR in their Final EIS. I understand also that advances are being made in accelerator-based alternative technology research, and DOE may want to consider this alternative in the Final EIS, as well.

INEL offers an experienced, effective reactor operations management. However, in keeping with Congress' insistence that federal dollars are used as wisely as possible, the INEL management is actively evaluating the privatization of reactor facility operations to assure effective use of tax dollars.

9 The Idaho Brain Tumor Center has offered to coordinate its reactor conversion plans for the PBF with the DOE, potentially saving millions of dollars.

Isotopes USA and the Idaho State University have offered private management and operation for the production of Mo-99.

One of the partners in the INEL management team, Thermo Technology Ventures, is actively researching alternative technologies for isotope production.

10 INEL offers the lowest cost alternative for isotope production. We can simply not afford to pursue any alternative but the most cost-effective means to meet isotope production needs.

11 The PBF Reactor is the only alternative in the DEIS that uses low-enrichment uranium at the onset of operations, reducing the waste generated and the security requirements inherent in using highly-enriched uranium.

12 I believe the DOE has moved far too quickly with far too little data in recommending a preferred alternative for isotope production. I strongly encourage DOE to take another look at INEL and assemble detailed costs for a wide array of alternatives in the Final EIS.

Responses to Transcript IDA02

- 1 Please see response to comment C015-1.
- 2 Please see response to comment C015-2.
- 3 Comment noted.
- 4 Please see response to comment C015-4.
- 5 Comment noted.
- 6 Please see response to comment C015-1.
- 7 Please see response to comment C015-7.
- 8 Please see response to comment C015-8.
- 9 Please see response to comment C015-9.
- 10 Please see response to comment C015-10.
- 11 Please see response to comment C015-11.
- 12 Please see response to comment C015-12.

1 | I want to offer my enthusiastic support to the local effort to use the Power Burst Facility and the
Idaho Brain Tumor Facility for the production of Mo-99. In my view, it makes great sense to
couple the Boron Neutron Capture Therapy (BNCT) program with the production of important
medical isotopes.

2 | To begin with, according to the technical experts I have consulted, the Power Burst Facility is the
ideal reactor for the production of medical isotopes.

3 | At the same time, the PBF can be prepared for this mission in less time and at less cost than any
other option being considered by the Department of Energy.

4 | The Idaho Brain Tumor Center is an excellent example of this new private enterprise expansion
and the production of Mo-99 and the PBF Reactor would complement this effort.

Responses to Transcript IDA03

- 1 Comment noted.
- 2 Please see response to comment C014-2.
- 3 Please see response to comment C014-3.
- 4 Please see response to comment C014-4.

1

I believe the PBF facility demonstrates the most efficient, technologically compatible and environmentally sound facility for production of the supply of Mo-99 for the U.S. medical industry and I suggest its designation as such.

2

The Idaho PBF Reactor can supply 100% of the domestic demand for Mo-99 and still have excess production capacity for the exportation of Mo-99.

3

Further, the PBF, the humanitarian aspects of the combined National Center for BNCT and the isotope production project makes the INEL's PBF the clear choice for the production of the nation's supply of medical isotopes.

Responses to Transcript IDA04

- 1 Comment noted.
- 2 Please see response to comment C016-2.
- 3 Please see response to comment C016-3.

1 | The Board of Directors and administrative staff of the Idaho Falls Symphony is in support of the production of medical isotopes for cancer and heart disease screening and therapy at the Idaho National Engineering Laboratory.

2 | We believe the Power Burst Facility is technically the superior facility for the project. In addition the location would eliminate the need for shipment of low-level waste across state lines.

3 | We also believe the Idaho Falls community would provide the necessary infrastructure, including medical, educational and cultural facilities to support the project and its personnel.

Responses to Transcript IDA05

- 1 Comment noted.
- 2 Please see response to comment C010-2.
- 3 Please see response to comment C010-3.

1 | We [the INEL Committee of the Chamber of Commerce] certainly back the facility which is
covered in the EIS.

2 | The PBF Reactor is the only one using low enriched uranium fuel, which reduces the weight
generation and the security requirements.

3 | The PBF can dispose of the low-level waste generated on the Site, while the preferred alternative
would require packaging and shipping across state lines to the Nevada Test Site.

4 | Currently the PBF is the only choice which envisions the private sector taking over production.

5 | ...we have half again that that we can sell as excess to the rest of the world or to whoever.

6 | Sandia can only produce 30% at the max of the U.S. requirement at this time,

7 | ...we are probably ten years away from an accelerator which could be used for this type of
operation.

Responses to Transcript IDA06

- 1 Comment noted.
- 2 The Power Burst Facility is the only reactor currently using low enriched uranium fuel. All the other reactors evaluated in detail have designs for converting to low enriched uranium. The objective is not to build any more highly enriched uranium fuel bundles for any of the other reactors, but to use the fuel already on hand until the supply is exhausted or, in the case of the Annular Core Research Reactor, until the burnup limit is reached (see Section 3.3.1.9). Two or three transition cores of both low enriched uranium and highly enriched uranium would be used during the conversion to all low enriched uranium fuel for these options. This is a long-term safeguards advantage, in that it depletes and irradiates the weapons grade material on hand.

It is not true that use of low enriched uranium fuel minimizes waste. More spent fuel bundles are generated per reactor full power year with the use of low enriched uranium bundles.
- 3 The Department recognizes that "cradle-to-grave" waste management is a benefit of the INEL and LANL alternatives.
- 4 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE. The Department is aware of this potential for the INEL alternative. Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.
- 5 If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The goal of the proposed project is to ensure that a reliable supply of Mo-99 is available to the U.S. medical community, thus, 100% of the U.S. demand would be produced only during times when the Canadian supply was unavailable. While each alternative could produce at least 100% of U.S. demand and export of Mo-99 could help offset operating costs, it is not the goal of the proposed project to produce Mo-99 for export and compete in the worldwide market for Mo-99.
- 6 As stated above, all of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99. However, the SNL/NM facilities are the only ones that could produce a fraction of the U.S. demand within 6 months following a Record of Decision to proceed with the proposed action. The ability to produce a fraction of the U.S. demand in a short period of time is important because, if a Mo-99 shortage were to occur in the near future, the Department would be able to supply at least part of the U.S. needs. In the near term, with a single reactor producing 100% of the U.S. demand, a shutdown of that reactor for any reason would result in a Mo-99 supply shortage. The potential for such a shortage is why the ability to produce even a fraction of the U.S. demand in the near term is considered important. This would provide DOE with a Mo-99 extraction process which has met FDA approval requirements in the very near term and would be capable of providing up to 30% of the U.S. demand on an emergency basis. This early experience would also be an asset in the expansion to full-scale production capability.
- 7 Use of accelerators is discussed in Section 3.4.1.7.

1 | ...the information we were given was that there really was not that much in the way of core modifications that needed to be done, so we kind of feel like that is an unfair statement.

2 | PBF has been, on a yearly basis, updating their costs for getting the plant started ever since, I think, it was 1987, because we have been wanting the Boron Neutron Capture Therapy. So they are detailed, and they are accurate.

3 | We have heard that their initial estimates were kind of gross and that when they heard how detailed ours was, they were given an extra month to change theirs. So if theirs was so good, why were they given the extra month?

4 | Then like has already been mentioned, the Boron Capture Therapy is willing to share the costs. They have got an investor that probably would be able to handle the whole thing by himself, so seems like it would be a lot cheaper just to look at us.

5 | ...if it is going to be up and operating anyway, why not do the Mo-99?

Responses to Transcript IDA07

- 1 The required Power Burst Facility (PBF) modifications are discussed in Section 3.3.4.9. The estimate for the required modifications is approximately \$450,000. The cost estimates in Section 5.22 have been modified to include this cost.
- 2 The Department has used the best available information for all of its analyses and comparisons, including the cost information. Information on restart of the PBF was fairly thorough and was probably a result of the efforts to estimate costs and schedules for conversion of PBF for boron neutron capture therapy (BNCT). However, reactor conversion and operation is only a portion of the cost and schedule information requested. Hot cell modification, process line fabrication, target fabrication facility modification, and general processing operational costs also are reflected in Section 5.22 of the EIS. Additional information on the estimated cost of the INEL alternative was obtained subsequent to the publication of the Draft EIS and was used in the preparation of the Final EIS; however, the amount of supporting material associated with these estimates was less detailed than that received from some of the other sites. Thus, the EIS contains statements that indicate the margin of error for both the INEL and ORNL estimates are considered larger than for LANL and SNL/NM.
- 3 All sites were notified of the request for cost and schedule information at the same time and were provided the same deadline. No site was given an extra month to prepare cost estimates. Following the deadline and internal reviews, issues at each of the sites were identified regarding the proposed costs and schedules. Each site, including INEL, was contacted and these issues were discussed and resolved.
- 4 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for BNCT and that other reactors under consideration for this project may be useable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 5 As stated above, IBTC is also investigating other facilities for use in conducting BNCT. It is not evident that IBTC will take the PBF to an operational state.

1

It is pretty obvious that if the takeover of the Mo-99 production occurs in America, that the source would probably dry up in Canada and possibly elsewhere. And so if the Defense Department is able to take over the New Mexico operation at its whim and fancy, mind you, I am an old Air Force man, so I fully support the defense initiative. But if they were to take it over, then we would no longer be producing the Mo-99. And if we do not have the Mo-99? We are in trouble.

So I think that very one fact alone should disqualify New Mexico.

Response to Transcript IDA08

- 1 The Annular Core Research Reactor (ACRR) is a DOE-owned facility, not a Department of Defense facility. It is possible that the ACRR, the preferred reactor for the proposed project, could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.

1

From the figures that I have been shown here locally and, again, we seem to have some discrepancy with what you have got in your figures, I think I have seen the same figures as Mr. White has seen. It appears that it makes no financial sense to put this facility anywhere but Idaho Falls.

Response to Transcript IDA09

- 1 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

1 | ...our endorsement of the DOE Project for the Production of Medical Isotopes for the screening and therapy of cancer and heart disease; and our endorsement of the project being located at the Power Burst Facility at the Idaho Falls Engineering Laboratory.

We believe the PBF is technically and economically superior among the four DOE sites being considered for the Isotope Production Project

2 | ...this project offers both the Isotope Production Project and the Boron Neutron Therapy - - Concentration Therapy Mission certainly at reduced cost to both of them. And we feel that is a very strong point.

3 | In summary, we believe that coupling the Isotope Production Project with the BNCT Mission will be the most cost effective, saving millions of dollars;

4 | will produce on the order of 120 new jobs, technical jobs, high compensation rates for the Southeast Idaho area economy,

5 | and will provide for the desired technology transfer to the private sector, which has been supported in the past.

Responses to Transcript IDA10

- 1 Comment noted.
- 2 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE. The Department is aware of this potential for the INEL alternative. Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.
- 3 As stated above, the IBTC has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be useable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 4 The socioeconomic impacts of the proposed project are evaluated in Section 5.3 of the EIS.
- 5 Possible technology transfer activities, as well as treatment facilities that might operate concurrently yet independently of the Mo-99 mission (such as boron neutron capture therapy), are not part of the Department's proposed action or stated purpose and need.

- 1 | I am here in support of locating the production of medical isotopes and the Boron Neutron
Capture Therapy Project, otherwise known as BNCT at the INEL.
- 2 | The PBF Reactor is the only reactor using low enrichment uranium fuel which reduces waste
generation and security requirements.
- 3 | The PBF can dispose of the low-level waste generated on site while the preferred alternative
would require packaging and shipping across state lines to the Nevada Test Site.
- 4 | One reactor suitable for both the Isotope Production and Cancer Treatment Mission. The PBF
can produce 100% of the nation's demand for medical isotopes.
- 5 | PBF can accomplish this at the lowest possible cost.
- 6 | PBF, to my knowledge, is the only choice which envisions a private sector taking over
production, a good way to demonstrate technology transfer and create jobs here in Southeast
Idaho.

Responses to Transcript IDA11

- 1 Comment noted.
- 2 Please see response to comment C013-2.
- 3 Please see response to comment C013-3.
- 4 Please see response to comment C013-4.
- 5 Please see response to comment C013-5.
- 6 Please see response to comment C013-6.

1 | . . . a reactor like that, is it a defense laboratory? If it has a defense mission, it has a hold on it by the Defense Department. It has to have special fuel used for that purpose. Different kinds of fuel has to be made to use it for Mo-99 production. It does seem to run counter to the prime purpose that DOE has in coming up with an isotope production mission.

2 | I believe that, in fact, the commercial industry, in looking over what they will want and what they can support, would certainly reject anything that would have that kind of stipulation necessarily put on it.

Responses to Transcript IDA12

- 1 The Annular Core Research Reactor (ACRR) is an Office of Defense Programs facility within DOE, not a Department of Defense facility. It is possible that the ACRR, the preferred reactor for the proposed project, could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.
- 2 The Department believes that the probability of the ACRR being diverted for defense use is sufficiently low that it would not significantly diminish this alternative's potential for privatization.

1

It also seems to me that Tc-99 is one of the most used medical commodities there is. It is used, what, I have heard 36,000 times a day all across the country, and the only source is a foreign country whose interests are not necessarily the same as ours.

Thus, it seems obvious to me that we need a way to make the substance here.

2

Thus, I am in favor of this project. I also live here, and I am in favor of seeing it here. Certainly the BNCT should be here. We have all the facilities; we have been waiting for it. Local physicians have been involved in getting it started. We do not see it yet, but it is very important that we do see it.

So I encourage, number one, the DOE to get active to do something. Do not wait six to 12 months to get on the ball.

Number two, have it here. It is the cheapest; the easiest; we have all the resources here.

Responses to Transcript IDA13

- 1 The Department is proposing to establish a domestic production source of Mo-99 to ensure that a reliable supply is available to the U.S. medical community. The Department's concern is not that the current source of supply is a foreign source. If the Department decides to pursue this project and at some later date a reliable domestic supply could be ensured by foreign suppliers, then the Department would phase out its production of Mo-99.

- 2 Comment noted.

1

As far as the defense hold on the reactor down there, to a facility like ours, and for all the other ones across the country, that alternative is just as scary as staying with Canada and having that source be abolished.

Defense, of course, you know, is number one, but if the Defense Department should take over that reactor, what is to happen to all the patients, all the out-patient facilities and even the hospitals that use this every day and rely on it?

Responses to Transcript IDA14

- 1 The Annular Core Research Reactor (ACRR) is an Office of Defense Programs facility within DOE, not a Department of Defense facility. It is possible that the ACRR, the preferred reactor for the proposed project, could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.

1

...why is the DOE looking to replace one reactor with one reactor? We are getting essentially back into the same scenario.

Response to Transcript IDA15

- 1 The Department is not proposing to replace the Canadian reactor. Instead, the Department is proposing to establish a backup to the currently operating Canadian reactor. Nordion International, the Canadian Mo-99 supplier, intends to build two new reactors to replace the current aging Canadian Mo-99 production reactor, which is planned to be shut down in 2000. If the DOE decides to pursue this project, it will operate its Mo-99 facilities at full production capability only in the event of a Mo-99 supply shortage.

1

I clearly have a concern that there is no advantage to Sandia over Idaho. In listening to the comments we have heard today, it is very clear that in terms of cost, safety, production capability, the PBF is clearly the most advantageous site that DOE should choose.

Response to Transcript IDA16

- 1 The SNL/NM option was selected as the preferred alternative for the reasons stated in Section 3.3.1.1.

The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

1 | This country does not produce, but is an importer of radioisotopes. We must establish this capability in the U.S..

2 | The Idaho National Engineering Laboratory brings a unique mix of scientific knowledge, isotope production experience, facility availability, and an established professional and university network.

3 | Considering that the no-action alternative is an alternative, I would suggest that you positively consider the social benefits of establishing a Mo-B production capability in this country; that you positively consider the economic benefits of building that capacity around established strength; that you positively consider the environmental, economic and technical benefits of investing in the development of advanced technologies to produce radioisotopes more effectively and efficiently; and, that you positively consider the environmental and economic benefits of building upon the existing isotope production capacity, including facility in human resources such as already exists at the INEL; and, that you consider the environmental benefits of inside defense production capability, such as also exists at the INEL.

4 | ...and that production begin as quickly as possible.

Responses to Transcript IDB01

- 1 Please see response to comment C095-1.
- 2 Please see response to comment C095-2.
- 3 Please see response to comment C095-3.
- 4 Please see response to comment C095-4.

1 The Idaho National Engineering Laboratory's Power Burst Facility Reactor has recently been listed as the potential site of the United States' sole source of Mo-99 isotope production. I believe that the PBF represents the most technologically compatible, economically efficient and environmentally sound facility for domestic Mo-99 production and urge its designation as such.

2 Idaho is proud that the PBF will soon focus the world's attention on the implementation of Boron Neutron Capture Therapy at the Idaho Brain Tumor Center. The technological partnership between DOE and IBTC is a credit to Idaho and the nation. It is my hope the victims whose maladies will be treated from here, whether from Idaho, the other U.S. or around the world, will come to understand, as you and I do, the broad advantages to our lives this government/private sector relationship creates.

3 The production of medical isotopes and the practice of BNCT are technologically compatible projects which can be carried out more efficiently and more cost effectively at the INEL's PBF reactor than at other facilities currently under evaluation by DOE.

4 Initial engineering studies show that the Idaho PBF facility can be ready for medical isotope production in less time and for \$5 million less than any of the other three finalists being considered for the project.

5 High product quality and consistency of supply are the two most important ingredients when considering a facility for the production of medical isotopes. The Advanced Test Reactor, also located at the INEL, has been producing specialty isotopes for many years. The expertise is presently in place to produce isotopes to the highest quality standards. With the PBF serving as the main isotope production facility, the ATR can fill in and maintain a constant production schedule when the PBF is down for routine maintenance and refueling. Idaho offers a twin reactor concept that assures consistency of supply for many years to come.

6 The U.S. currently has no domestic supply of the most widely-used medical isotopes. The Idaho PBF Reactor can supply 100% of the domestic demand for Mo-99 and still have excess production capacity for the exportation of Mo-99

7 DOE intends to privatize the Isotope Production Program. IBTC's present 30-year lease of the PBF Reactor puts the privatization plan into effect immediately.

8 No other federal missions will interfere with the operation of Mo-99 production at the PBF, unlike some of the other sites under review.

9 After considering the lower start-up costs, mission compatibility and technological superiority, it is clear that INEL's PBF is the logical home of the U.S. Mo-99 production source.

Responses to Transcript IDB02

- 1 Comment noted.
- 2 Comment noted.
- 3 Please see response to comment C037-3.
- 4 Please see response to comment C037-4.
- 5 Please see response to comment C037-5.
- 6 Please see response to comment C037-6.
- 7 Please see response to comment C037-7.
- 8 Please see response to comment C037-8.
- 9 Comment noted.

1 | We have modified our plans to allow for a dual medical mission, which really seems to make the most sense for this facility, one project practically guaranteeing the success of the other.

2 | DOE has stated that the goal is to eventually privatize the production of medical isotopes and turn over to the private sector and let the free market enterprise forces dictate the price of supply of these products.

3 | The selection of the preferred site virtually guarantees that this will never happen, at least at that location. IBTC wonders what company would normally enter into a privatization effort, given the fact that situations in the world could force a mission to be returned to a military mission and, thereby, terminate or severely curtail production at that facility.

IBTC believes that a few months of schedule is a small price to pay for the assurance of a truly dedicated facility that could be brought on line and satisfy all production requirements for 100% of U.S. demand with excess capacity potential for export to other countries and to fill dual medical mission roles for one facility that cannot be impacted by changes in Defense policy.

4 | INEL has had 35 year's experience in the production of isotopes, meeting the critical needs of customers, their demands for quality and a reliable schedule. The other sites have had no experience in this area.

5 | IBTC questions the wisdom of selecting a site that seems to fall short of DOE's goals from the beginning.

Responses to Transcript IDB03

- 1 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 2 The Department would prefer that the private sector assume responsibility for ensuring that a reliable supply of Mo-99 is available to the U.S. medical community; however, private industry has thus far been unwilling to do so. Therefore, DOE has proposed to conduct the Medical Isotopes Production Project. If private industry is able to ensure a reliable supply of Mo-99 on its own, the Department would phase out its production activities.

Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis.

- 3 It is possible that the Annular Core Research Reactor (ACRR), the preferred reactor for the proposed project, could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.

All of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99 and would also be capable, to varying degrees, of conducting synergistic activities. If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage. The goal of the proposed project is to ensure that a reliable supply of Mo-99 is available to the U.S. medical community, not to compete in the worldwide market for Mo-99.

- 4 As presented in Table 3-2, LANL and ORNL also have significant experience in the production and distribution of isotopes.
- 5 The Department has not made a decision regarding if and where to conduct the proposed project. A preferred alternative is identified in an EIS, in essence, to tell the public which way the Department is leaning on a decision, but it does not mean that the decision has been made. Further, Council on Environmental Quality regulations require Federal agencies to identify the preferred alternative in a Draft EIS if the agency has one, and require that the agency identify a preferred alternative in a Final EIS.

The Annular Core Research Reactor/Hot Cell Facility combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.

1 |

I support the medical isotope being here in Idaho.

Response to Transcript IDB04

- 1 Comment noted.

1 You mentioned on privatization as being off in the future. I am associated with a privatization action here at the Site. It is very real. The pressure is there, and I do not understand how in your office in D.C. you somehow are not getting the sense that it is in the now. If the private sector can do the job, we have the pressure on us that that is the way it is supposed to be done. And so we are doing that actively out at the Site right now. I suggest that you reconsider your criterion and get that more in focus that if you can have that option of a privatization in the now term, that you have that as a consideration compared to the others, because where many other things are equal, I would think then that it automatically starts rolling into that bin, if you understand what I mean.

2 Now with the PBF being an option, and the only way that is basically happening is in this lease arrangement at IBT, then you are under an NRC license situation. Section 6.1 in your EIS works in terms of DOE orders. Most all the DOE orders would not be applying in this case, because you would be under the license-type of arrangement.

3 And on the Sandia Reactor, I do not know what the state is on their SAR to the latest requirements.

4 I would think that with the distance we have where the reactor and the other facilities relative to site boundary, which nobody lives at, is that this inherently is a difference, albeit, I think it can be safe anywhere. It is a matter of just doing it, but there are certain things to me that just make a little more sense of doing it where you have more distance to where the public is in case something does go wrong.

5 BNCT does get a stronger basis economically to occur, if you can work with this other situation, you know, the medical isotope. I think the government should give that a certain extra weight, too. It is multiple use of a facility of our assets as taxpayers of how to put this to more effective use. And it is a good machine. So please, give this due consideration.

Responses to Transcript IDB05

- 1 The Department would prefer that the private sector assume responsibility for ensuring that a reliable supply of Mo-99 is available to the U.S. medical community; however, private industry has thus far been unwilling to do so. Therefore, DOE has proposed to conduct the Medical Isotopes Production Project. If private industry is able to ensure a reliable supply of Mo-99 on its own, the Department would phase out its production activities.

Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.

- 2 The Idaho Brain Tumor Center (IBTC) has not made a formal proposal to the Department regarding the dual use of the Power Burst Facility (PBF). Therefore, the Department cannot say for certain whether operation of the PBF for the production of Mo-99 would be conducted privately (by IBTC) or by DOE. In developing the EIS, the Department assumed that if the PBF were selected for the isotope production mission, DOE would operate the reactor under DOE regulations.
- 3 The Annular Core Research Reactor (ACRR) safety analysis report (SAR) was recently revised to conform to the DOE Order 5480.23 "Requirements for Safety Analysis Reports" and is adequate for initial Mo-99 production activities. However, a future SAR update would be required to address the core and fuel design changes anticipated for full production at the ACRR.
- 4 The EIS considers the potential impacts to individuals and communities from operations and potential accidents in Section 5. Regional geographic and meteorological conditions, as well as area population, all are factors that were included in the evaluation of the potential impacts of the proposed project.
- 5 The IBTC has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be useable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

1 | Beauty For All Seasons, Inc. wholeheartedly endorses and supports the DOE's selection of the Idaho Falls PBF Facility for the future production of Mo-99 medical isotopes.

2 | The selection of Idaho Falls PBF Facility for medical isotope production will increase employment opportunities, improve economic base not only directly through people employed at the facility, but also through the ripple effect of increased visitors for technical and medical purposes.

3 | We are a nation that is suffering a balance of payments problem. We are buying everything from the Japanese, the Germans and the Canadians. That causes a weaker dollar. Here is a chance for us to put 100% of the Mo-99 production in this country for us to make the product here and serve it, and we certainly need it. We have got to buy it from somebody. Let us buy it from ourselves. Let us get jobs here. We have got the technical skills, better skills than the Canadians have. Let us bring the business here; let us employ the people here; let us help the balance of payments come into this country. Let us have Canadians and Europeans buy Mo-99 production from us. We need to think about this business not just in terms of is Sandia going to give us 10% production? Is it going to satisfy the medical isotope people that need to throw a bone out? What is important is we have got to think about the nation, too. And in my mind, that is as important to me as to think about Idaho Falls as a community.

Responses to Transcript IDB06

- 1 Comment noted.
- 2 The anticipated socioeconomic impacts of the proposed project are presented in Section 5.3. The number of technical and medical visitors to the region as a result of the Mo-99 mission is expected to be very small at any of the alternative sites. All sites have the possibility of additional missions.
- 3 The Department is proposing to establish a domestic production source of Mo-99 to ensure that a reliable supply is available to the U.S. medical community. The Department's concern is not that the current source of supply is not a domestic source. If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage. The goal of the proposed project is to ensure that a reliable supply of Mo-99 is available to the U.S. medical community, not to compete in the worldwide market for Mo-99.

1

I agree with others here that Idaho seems to be, from a radiological consequence consideration, the logical choice, and when compared with the cost analysis and in light of measures that could be taken to reduce the potential for transportation-related accidents, certainly by far is arguably the best choice.

2

The fact that I went to prototype here in 1984 and 1985 has nothing to do with that, but I do agree that this is a very good center of highly qualified and skilled technical and engineering people that are very well capable and ready to do these sorts of projects.

Responses to Transcript IDB07

- 1 Comment noted.
- 2 The INEL and each of the other alternative sites have available the highly qualified and skilled technical and engineering staff necessary to conduct the proposed project.

1 |

I would just like to go on record that I do support this program,

Response to Transcript IDB08

- 1 Comment noted.

- 1 | It would be smartest to allow the INEL to take on the project.
- 2 | It is the cheapest available to operate the project, and it is technically the best suited.
- 3 | ...the private company to run the facility is also here at the INEL,

Responses to Transcript IDB09

- 1 Comment noted.
- 2 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.
- 3 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE. The Department is aware of this potential for the INEL alternative. Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.

1

If the Cancer Treatment Center gets this project, it virtually assures both of them will succeed, whereas certain people have voiced some opinion that maybe the Cancer Treatment will not be viable by itself.

I think that if it got this project, it makes one of the two have zero cost, basically, or half the cost of the other one.

Response to Transcript IDB10

- 1 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may also be useable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

1

I want to state why it makes economic sense to locate this facility in Idaho Falls. In looking over the Draft Environmental Impact Statement, there are certain obvious differences, but the most obvious one to me as a businessman here in Idaho Falls, is the economic difference.

2

There is \$2 million that will be saved in construction costs; \$4 million per year in operating costs;

Secondly, there is the possibility that even if that production came up in six months, that those medical isotopes could not be used because of contractual obligations between Nordion and pharmaceutical companies. So we do not even know for sure that the six months would even result in any net benefit.

Responses to Transcript IDB11

- 1 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.
- 2 The ability to produce even a small amount of Mo-99 in a short period of time is important in that, if a Mo-99 shortage were to occur in the near future, the Department would be able to supply at least a fraction of the U.S. demand. The Department has proposed the Medical Isotopes Production Project to respond to a near-term "window of vulnerability" in the Mo-99 supply situation. With a single reactor currently producing 100% of the U.S. demand, if that reactor were to be shut down, it would result in a Mo-99 supply shortage. The potential for such a shortage is why the ability to produce even a fraction of the U.S. demand in the near term is considered important. This would provide DOE with a Mo-99 production and extraction process which would meet FDA approval requirements in the very near term and would be capable of providing up to 30% of the U.S. demand on an emergency basis. This early experience would also be an asset in the expansion to full-scale production capability.

1

This gives us a unique opportunity to produce a medical product in Idaho that we can sell elsewhere.

Response to Transcript IDB12

- 1 The Medical Isotopes Production Project would provide the same unique opportunity at any of the proposed sites. The INEL already has an active medical isotope program. The proposed project would add to this established capability.

1 The ACRR says that they will have to replace their fuel with brand new fuel to transition. Has this fuel been purchased? Has it been designed. Has any safety analysis been done running the core with this new fuel? How much is it going to take to be able to change over to a brand new fuel?

2 PBF is listed as having a six-inch test space, when it actually is eight and a quarter and it says that we can handle at least 19 targets when we can handle probably at least 27 targets. It says we can put only one target in out transient rods. The physical space would allow anywhere from two to three additional targets.

3 If you look at the figures for PBF at 2400 curie days of Mo-99, and you add the additional targets that can be put into our core without any modifications, which the EIS says is required, and it is not, then we end up almost doubling the amount of Mo-99 to well over 3,000 curie days, to well over, which is a heck of a lot more than Sandia can make, because they are struggling to reach 100%, whereas we can go well over 100%.

Responses to Transcript IDB13

- 1 No new fuel has been purchased. The price has already been determined by General Atomics, which will be the same price as a normal TRIGA bundle. The new fuel has been designed. Calculations have been performed on the new fuel and core design, but the safety analysis report would require updating to include these descriptions and calculations. Since the core was originally designed to run with normal TRIGA fuel, the design change to fuel (that is mechanically identical to fuel already used) is not very expensive.
- 2 The 6-inch diameter is a typographical error, and Section 3.3.4 was changed to correct this error. Using a standard geometric spacing configuration to attempt to keep the thermalization of neutrons consistent among the targets would dictate use of a 37-target arrangement as the step beyond the 19-target configuration. A 27-target configuration would probably not work very well because differences in the targets' thermal flux fields will produce different power levels. An adequate water space between the targets is required for both cooling and moderation.

Increasing the number of targets reduces moderation and hence reduces fission rate and Mo-99 production rate per target. This increases the waste per curie of product.

- 3 The Department has performed calculations that indicate the Power Burst Facility (PBF) can produce 20 kW per target in the 19-target configuration. These calculations indicated that the PBF could conduct a full production Mo-99 mission, even though the PBF's flux is lower than the other facilities. Using the pulse rod receptacles for ancillary irradiation locations seems to be adequate to assure full production could be reached, even if full production were not capable in a central irradiation cavity. The Department agrees that pulse rods could probably accommodate two targets. Three could be inserted, but they would run at lower power levels because of the decrease in moderation, impacting waste as discussed above.

1 |

I hope it is here. If it is not, that is okay, as long as it was based on good, sound logic.

Response to Transcript IDB14

- 1 The rationale for the Department's decision will be documented in a Record of Decision that will be issued following completion of the Final EIS.

1

...my comment is in the EIS there is some statements that says that the data provided by the INEL was -- I do not want to use the word suspect, but not as much detail as some of the other sites.

I just wanted to make it clear that when we received the notice to provide the data, we had about a month to a six-week period of time to compile all of the data, and there was, you know, some best engineering practices used to come up with that data.

However, to eliminate those uncertainties, it is very easy and within the realm of what we can do to provide better data on any uncertain areas you might have any question.

Response to Transcript IDB15

- 1 The EIS project team identified the Power Burst Facility (PBF) as a possible reasonable alternative for Mo-99 production. The INEL had proposed use of the Advanced Test Reactor and had not mentioned the PBF in previous studies and analyses. Thus, when cost and schedule information was requested, the INEL did not have the existing data that other alternatives had prepared for the previous studies.

The level of information provided for cost estimates by INEL was considered appropriate to the purpose of an EIS. Although it is believed that the uncertainties associated with the INEL estimates are higher than those of other alternatives, the estimates have sufficient accuracy to demonstrate that costs for any of the alternatives is not a major discriminator and is not a basis to disqualify any of the alternatives from consideration within the EIS. Because INEL has not been identified as a preferred alternative for this proposed project in the past as the LANL and SNL/NM alternatives have or even as an alternative in the past as ORNL has, the amount of detail available in support of the proposed project at INEL is less, but what has been developed in support of this EIS is considered appropriate. Additional cost information has been obtained and included in Section 5.22 of the EIS, and cost and schedule information will continue to be developed for the Department's eventual decision on this proposed project.

1 |

I am in favor of the Medical Isotopes Production Project being in Idaho Falls.

Response to Transcript IDB16

- 1 Comment noted.

1

I want to go on record strongly supporting the Medical Isotopes Production Project. I am one of the past Presidents of the Chamber of Commerce here in the greater Idaho Falls area. In the last three years we have gone through a tremendous downsizing of our economy, and this community has gathered together in a major coalition effort to look at new industries and to look at new application at the Idaho National Engineering Laboratory, and I can not think of a better one than the BNC Project of which these hearings are conducted for.

Response to Transcript IDB17

- 1 The potential socioeconomic impacts of the proposed project are presented in Section 5.3. The Boron Neutron Capture Therapy initiative under investigation by the Idaho Brain Tumor Center is not part of the Department's proposed action.

1

I am in support of the Medical Isotopes Production Project. I think Idaho Falls is the ideal location for it. We have the technology, background, and I believe the support of the community for this project.

Response to Transcript IDB18

1 Comment noted.

1 But what is proposed by DOE as the preferred alternative is a Band-Aid approach. In my own
mind, I consider the New Mexico choice to be a political statement which was determined before
the Environmental Impact Study was even started and does not judge alternatives on their merit.
The selection process does not judge alternatives on their merits. I do not consider the investing of
millions of dollars in temporary use of a reactor dedicated to military programs as a reasonable
solution to our country's needs for medical radioisotopes.

2 I propose we use a reactor already dedicated to medical applications and which could be privatized
as a superior long-term concept. Of course, I am referring to the Power Burst Facility at the former
National Reactor Testing Station in Idaho. This alternative is not marginally equal as stated in the
Environmental Impact Statement. It is superior in almost all of the technical and environmental
issues.

3 . . .the INEL, has also had more experience in the safe shipments of radioisotopes than any other
location, because of the over 40 year's experience of the test reactors program.

4 . . .it would be more economical in the long run. To me as a taxpayer, this is the overriding
consideration.

Responses to Transcript IDB19

- 1 The Department has not made a decision regarding if and where to conduct the proposed project. A preferred alternative is identified in an EIS, in essence, to tell the public which way the Department is leaning on a decision, but it does not mean that the decision has been made. Further, Council on Environmental Quality regulations require Federal agencies to identify the preferred alternative in a Draft EIS if the agency has one, and require that the agency identify a preferred alternative in a Final EIS.

The Annular Core Research Reactor/Hot Cell Facility combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1. The rationale for the Department's decision will be documented in a Record of Decision that will be issued about 30 days after the Final EIS is issued.

- 2 The advantages and disadvantages of each site are shown in Table 3-1 and Table 3-2. The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.
- 3 As presented in Table 3-2, LANL and ORNL also have significant experience in the production and distribution of isotopes.
- 4 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.

1

...the airport has adequate capacity and capability to support the proposed action without the expenditure of any funds for any expansions, modifications, or other such expenditures.

Response to Transcript IDB20

- 1 The Department does not anticipate that any of the airports discussed in the EIS would require expansions or modifications to support the proposed project.

1

I think it very important to bring this project here, because the people who are very knowledgeable are on site. Many buildings are on site, and the medical community here is already very familiar with this, and I think it would be a very important thing for the economic climate of this city and area.

Response to Transcript IDB21

- 1 INEL and the other alternative sites have the personnel and facilities necessary to conduct the proposed project.

1

I would like to express my support for choosing Idaho Falls as the location for the Medical Isotope Production Project.

2

We have the expertise, the technology, and many of the necessary facilities needed for such a project in Idaho Falls.

Responses to Transcript IDB22

- 1 Comment noted.
- 2 The INEL and the other alternative sites have the nuclear technology expertise and facilities necessary to conduct the proposed project.

1

We do endorse the Idaho National Engineering Laboratory in regards to its continued research on the Boron Neutron Capture Therapy as well as expanding the production of medical radioisotopes for medical use, in particular the Mo-99 project as involved in the current EIS statement as released.

2

We believes that the IBTC with their research, with their ability and the personnel they have in the ionics connection, that they can accomplish this in an excellent fashion and, in fact, they, as opposed to other groups you have suggested as primary alternatives, will have the best chance of providing additional financial resources for a medical, bio-medical process of this nature.

And we think they are in large measure the best prepared to accomplish this.

3

And when you factor in the economics of the issue regarding the Boron Neutron Capture Therapy and the economics of providing that manufacture here at PBF, now when you couple that with the Mo-99 project and that manufacturing effort, and if you take the economics of both of those bio-medical engineering complexes together, we believe that the INEL is not only the preferred site, but economically it is far less expensive to create Mo-99 here when you look at the total picture and included within that the privatization.

The long-term goal is for the private industry, and let me stress this once more, to handle that production, and given the privatization that is currently existing with IBTC, that this pioneering agreement with the DOE, do we not get to that area of privatization quicker by utilization of the IBTC?

Responses to Transcript IDB23

- 1 Comment noted.
- 2 Comment noted.
- 3 The Idaho Brain Tumor Center (IBTC) has informed DOE of its interest in coordinating its efforts with those of DOE; however, IBTC has not submitted any plans for coordinating reactor conversion activities, nor has it made a formal proposal to DOE. In addition, the Department understands that IBTC is investigating the possibility of using other facilities for boron neutron capture therapy (BNCT) and that other reactors under consideration for this project may be usable for BNCT. If the Department decides to proceed with a production alternative for this proposed project, it would welcome a proposal from IBTC for dual use of the reactor facility selected.

Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received and the Department proceeds with the action proposed in this EIS, the Department would seek privatization proposals on a competitive basis.

1 | I have a hard time understanding the legal basis for establishing short-term production capability as the primary condition on which DOE is basing its preferred alternative.

2 | I would like to see information charting out the production quantity plotted out on a graph compared with the time of production and see if the values that the preferred alternative, compared with PBF, really are that incomparable.

3 | My second question is what is the crisis? The Canadian facility is currently in production. There was one horror story told at the public meeting of a six-day supply. What is the current back-up supply for the Canadian facility and why is a time period of 28 months unreasonable, given that reliable supply that has been operating without this crisis for six years since the other facility was discontinued in 1989?

Responses to Transcript IDB24

- 1 The ability to produce even a small amount of Mo-99 in a short period of time is important in that, if a Mo-99 shortage were to occur in the near future, the Department would be able to supply at least a fraction of the U.S. demand. The Department has proposed the Medical Isotopes Production Project to respond to a near-term "window of vulnerability" in the Mo-99 supply situation; therefore, the ability to produce even a small amount of Mo-99 in a short period of time is an important factor and will be considered in the Department's decision on the proposed project. The preferred alternative would be able to produce a small amount of Mo-99 in the shortest period of time, and this factor contributed to its selection as the preferred alternative. In the near term, with a single reactor producing 100% of the U.S. demand, the unavailability of that reactor for any reason would result in a Mo-99 supply shortage. The potential for such a shortage is why the ability to produce even a fraction of the U.S. demand in the near term is considered important. This alternative would provide DOE with a Mo-99 extraction process which has met FDA approval requirements in the very near term and would be capable of providing up to 30% of the U.S. demand on an emergency basis. This early experience would also be an asset in the expansion to full-scale production capability.
- 2 Potential future production quantities are not known and cannot be plotted. Since each alternative would be capable of producing 100% of the U.S. demand for Mo-99, the production quantities would be identical for each alternative.
- 3 The problem is that the entire U.S. supply comes from a single source. It should also be noted that this single source accounts for about 85% of the world supply of Mo-99. If this source were to become unavailable, production facilities in other countries would most likely focus on meeting their own needs first and, in any case, would not be able to meet even half of U.S. demand for Mo-99. Given this supply situation, the Department has proposed establishing a domestic production source as soon as possible to ensure that a reliable supply of Mo-99 is available to the U.S. medical community.

- 1 | ...privatization of this process should be the preferred option and should be given heavy weight in
this day and age in our government where the Department has reducing budgets, and we should be
doing everything to promote the private sector and reduce the size of government.
- 2 | I wholeheartedly encourage that Idaho Falls Power Burst Facility should be the preferred site.

Responses to Transcript IDB25

- 1 Private U.S. production of Mo-99 could be accomplished by privatization of a DOE operation or by a separate initiative by the private sector. The process of privatization is not part of this proposed action. The Department published a Notice for Expression of Interest in the *Federal Register* in December 1995 to solicit concepts from private industry for privatization of DOE isotope activities. Businesses interested in pursuing Mo-99 production have been invited to respond to this solicitation. If the Department decides to implement the action proposed in this EIS and if concepts on privatization of Mo-99 production received from the private sector are promising, DOE would proceed with a request for proposals to facilitate privatization on a competitive basis.
- 2 Comment noted.

1

In looking over the Draft Environmental Impact Statement, it was clear that there were some economic benefits to choosing a lab, specifically the INEL Lab, above all other alternatives.

The INEL choice is \$2 million less costly in construction and modification expenses and, more importantly, the INEL is about \$4 million less per year in routine operating expenses. For every two dollars that is spent at the INEL for operations, three dollars must be spent at the Sandia Lab.

2

Until DOE investigates what kinds of contractual obligations there are to Nordion with the pharmaceutical companies, it is not clear that even if the production were brought up in six months that there would be any market for the medical isotopes. It is not clear that there is any imparity to meet the six-month deadline. It is not clear that that amount of medical isotope produced after six months could even be marketed.

Responses to Transcript IDB26

- 1 The Department recognizes that the estimated cost of the INEL alternative is lower than that of the preferred alternative; however, the uncertainties associated with the estimated cost of the INEL alternative are higher than for the preferred alternative. If the Department decides to proceed with the proposed action, the information presented in the EIS (including the cost data), the operational readiness of facilities, and other programmatic factors will be considered in the final selection of facilities for Mo-99 production.
- 2 The Department intends to act as a backup to the Canadian supplier, not to compete with them. The Department would operate at full production levels only in response to a Mo-99 supply shortage. Thus, the ability to produce even a small amount of Mo-99 in a short period of time is important in that, if a Mo-99 shortage were to occur in the near future, the Department would be able to supply at least a fraction of the U.S. demand. To replace their single existing reactor, the Canadians plan to build two new reactors, each with the capability to produce 100% of the worldwide demand for Mo-99. They plan to have these two new reactors operating by the year 2000, so even if one of those reactors were to shut down, there would be adequate backup production capability at that time.

1 | Number two, it seems like it would be wise to give stress to a reactor that actually runs. And the document does give some indication of emphasis on that.

2 | In the case of the ORRR, in fact, it has been down a decade and would take some time to fill out all the documents. I doubt that it would take a major redesign.

3 | In the case of the Sandia reactor, for instance, the reactor has the wrong fuel, the wrong internal chamber, the wrong control mechanism. It has never been operated in a steady state. It appears a new reactor is needed. That may not be true. That is what appears from reading the draft statement. I just read it today. I am not an expert. I have not seen the reactor. But it looks as though costs must have been hidden. It looks as though the reactor has never been used in this type of mode and, therefore, a major rebuilding job is concerned, not just filling out paperwork. So it is not apparent from the text that it is a really feasible project at Sandia. It may well be, of course. They can do lots of things given enough incentive.

The draft indicates that the operation of the system could be interrupted by a decision to return to the best use of the annular core reactor. It would be required to change fuel again, put back the reactor internals, perhaps not rebuilding the whole system again. Perhaps the new one could do both jobs.

4 | The fact that needs to be put in the report seems to give it a higher level of likelihood than the common statement that in an emergency anything can happen. Given a bad enough emergency, the president could stop all diagnostic procedures in all hospitals. If the life of the country depended on it, that could happen. But that is a remote thing. It has not happened in any war up to date and it is not really noted. If this needs to be noted, that the defense needs could take over, then say it is a fairly likely thing. And that is important since the whole choice which the Department is said to have made depends on reliability of source and the reliability of starting sooner. It does not seem reliable at all.

So the report in its final form needs to deal with this problem. I am not saying it is absolutely impossible to deal with it. Perhaps a higher level of assurance could be made. Perhaps the Defense part of the group can decide they really do not need this facility anymore. Whatever. It can be handled perhaps. But it does seem to be a problem. Thank you.

Responses to Transcript ORA01

- 1 If the Department proceeds with the proposed action, the present status of the reactor (operational, standby, or shut down) will be an important consideration in the Department's decision. The fact that the Annular Core Research Reactor (ACRR) is the only operational reactor among the reasonable alternatives is a principal reason why that reactor was identified as part of the preferred alternative.
- 2 Section 3.3.3 discusses the required modifications.
- 3 The ACRR at SNL/NM would require several modifications, which are described in Section 3.3.1.9. The costs of these modifications were included in the SNL/NM cost estimates (shown in Table 5-1 and Table 5-52). Section 5.22 has been revised to provide a better description of the basis for the cost estimates.

All of the reactors evaluated as reasonable alternatives for the proposed project would (after necessary modifications) have the ability to produce at least 100% of the U.S. demand for Mo-99.

- 4 The possible diversion of the ACRR for defense use is highlighted in the EIS because, in an emergency, the ACRR is more likely than the other reactors considered in the EIS to be used for defense purposes. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration. A discussion on converting the ACRR back to support defense-related activities is provided in Section 3.3.1.9.

As a taxpayer, I am very concerned that the most expensive alternative seems to be the preferred alternative. And not only that, we are comparing an annual operating cost and a preparation cost. We are not comparing a life-cycle cost. I would like to see the Final EIS use life-cycle costs for comparison.

1 In this political climate where we are trying to balance the budget, I do not think we should choose the most expensive alternative. Now, I looked at the cost on page 5.100 to try to get some idea as to why is the preferred alternative the most expensive. I find several things. It is the only one of the four alternatives that needs to have major modifications made to its hot cell. And the reactor has to be upgraded from two megawatts to four megawatts. And because their fuel elements, they require a different size, I suspect that is why their annual operating costs are the highest. I am not sure about that. But I would like to see life cycles. I do not know whether that be a ten-year period or a twenty-year period. It is not that difficult to take a period of time and do a life-cycle cost so that we are comparing apples and apples.

There are some costs that are not — that are identified as being not in the tables. One of them is the restacking of fuel storage for the preferred alternative. The other one is an upgrade to the reactor for the Idaho facility. That is stated on page 5.101. I would like to see an estimate made of that.

2 Now, what really bugs me is the justification for there being a preferred alternative. I do not know why we should even go in to an official with a preferred alternative. Give them the data. Let them make the decision. Why are we even trying to go forward with a preferred alternative?

3 The statement -- the only statement really given in this document is on page Roman numeral X at the beginning, and it says because the reactor is currently operating. And certainly when we saw the schedule slide, we could see that they could start producing something relatively fast at six months. But that is a very small percentage as we found out during the question period. It is less than 10%. So it really would not get us too far along. And when you really consider being able to produce the entire amount needed, you are looking at twenty eight months versus thirty months in the case of Oak Ridge to battle the problem. So I do not consider that adequate justification for picking the currently operating reactor when it was not designed to do this job.

4 Now, there is some hand waving in the document about uncertainty of costs for the reactors that are not currently operating. What about the uncertainties in costs and schedule when your personnel are not experienced in what they are going to be undertaking? The experience is here in Oak Ridge. It is even stated correctly in the document that we have the experience here to do the whole job. There is also some 16 experience stated in the case of Idaho. And also in that case, there is also a potential for some cost sharing.

5 Now, my understanding is we stopped producing isotopes here because the government made the decision to go commercial. Now, I have had experience with this business of commercializing government functions. I am a retiree of NASA. And we have successfully commercialized the communication satellites, but we were not successful when it went to the case of the LANDSATS.

5 | Now, the government made a good attempt to commercialize. And I am not saying that is wrong or right. But it failed. It did not continue. And now we are having to go back to the government to provide a source of a critically necessary vital component of our modern-day life. So I do not feel as though the government has an obligation to try to help somebody commercialize this again.

6 | We should not try to put the Canadian firm out of business. But I think we are going to have a growth in this industry. This business of using the radioisotopes for body imaging has been growing all along. And I suspect that we could in the future sometime even sell the full hundred percent production from here and still not put the Canadian firm out of business. I do not really know that.

7 | I really do not think we should go — the Department of Energy should go forward in an EIS with a preferred alternative when the numbers do not come out to support it. Your costs do not support it. Your environmental things are really a wash. I mean, there is a slight preference maybe for Oak Ridge, but it is basically a wash. But the costs are very important in this political climate. So I urge you to include a life-cycle cost. Do not go forward with the preferred alternative unless it is clear cut and you can really make a case. And this EIS has not made the case for the preferred alternative.

Responses to Transcript ORA02

- 1 The costs for the modification of facilities and facility operations are presented in Table 5-1 and Table 5-52. An analysis of these costs and the projected revenues specific to this proposed project will be evaluated for each alternative as information for the Record of Decision process. Since each alternative proposes the use of existing facilities and the Department is already responsible for facility-related costs, such as facility decommissioning, an incremental cost analysis (rather than a life-cycle cost analysis) was considered appropriate information for the decision-making process for the proposed project.
- 2 The Department has not made a decision regarding if and where to conduct the proposed project. A preferred alternative is identified in an EIS, in essence, to tell the public which way the Department is leaning on a decision, but it does not mean that the decision has been made. Further, Council on Environmental Quality regulations require Federal agencies to identify the preferred alternative in a Draft EIS if the agency has one, and require that the agency identify a preferred alternative in a Final EIS.

The Annular Core Research Reactor/Hot Cell Facility combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.

- 3 The ability to produce even a small amount of Mo-99 in a short period of time is important in that, if a Mo-99 shortage were to occur in the near future, the Department would be able to supply at least a fraction of the U.S. demand. The Department has proposed the Medical Isotopes Production Project to respond to a near-term "window of vulnerability in the Mo-99 supply situation; therefore, the ability to produce even a small amount of Mo-99 in a short period of time is an important factor and will be considered in the Department's decision on the proposed project. In the near term, with a single reactor producing 100% of the U.S. demand, the unavailability of that reactor for any reason would result in a Mo-99 supply shortage. The potential for such a shortage is why the ability to produce even a fraction of the U.S. demand in the near term is considered important. This alternative would provide DOE with a Mo-99 extraction process which has met FDA approval requirements in the very near term and would be capable of providing up to 30% of the U.S. demand on an emergency basis. This early experience would also be an asset in the expansion to full-scale production capability.
- 4 The Department recognizes that, with the exception of SNL/NM, each of the sites has significant experience in the production and distribution of radioisotopes.
- 5 The Department would prefer that the private sector assume responsibility for ensuring that a reliable supply of Mo-99 is available to the U.S. medical community; however, private industry has thus far been unwilling to do so. Therefore, DOE has proposed to conduct the Medical Isotopes Production Project. If private industry is able to ensure a reliable supply of Mo-99 on its own, the Department could phase out its production activities.
- 6 Since the Department intends to be a backup to the Canadian supplier, the Department does not plan to compete with the Canadians and does not believe that the proposed project will put the Canadians out of business.
- 7 Please see response to comment ORA02-1 above.

1 | The document, the Draft Environmental Impact Statement, in my opinion, doesn't adequately justify the preferred alternative. I think additional information needs to be discussed about why the preferred alternative was chosen.

2 | For example, the table that was presented with the schedule information, it's unclear in the Oak Ridge area whether or not this is thirty months to full production, or if that's thirty months to initial production. So maybe some additional information there in terms of the schedules.

3 | I think that the Environmental Impact Statement needs to consider the probability that the Nevada Test Site will not be open for disposal of low-level waste and talk about contingencies at each of the alternatives for on-site storage until disposal is available and the associated risks with that disposal of that on-site storage.

4 | I think given that the Department of Energy is currently in discussions with private industry regarding possibilities for private partnerships, given the downsizing of the Department of Energy on many different competing needs, [and] that they could only carry the environmental cleanup that the final Environmental Impact Statement might be able to provide some additional information regarding any outcomes from the February 13th meeting.

Responses to Transcript ORB01

- 1 The Department has not made a decision regarding if and where to conduct the proposed project. A preferred alternative is identified in an EIS, in essence, to tell the public which way the Department is leaning on a decision, but it does not mean that the decision has been made. Further, Council on Environmental Quality regulations require Federal agencies to identify the preferred alternative in a Draft EIS if the agency has one, and require that the agency identify a preferred alternative in a Final EIS.

The Annular Core Research Reactor/Hot Cell Facility combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.

- 2 Table 3-2 has been clarified as appropriate.
- 3 The Department recognizes that "cradle-to-grave" waste management is a benefit of the INEL and LANL alternatives and will consider this factor in making its decision on the proposed project.

Regarding the issue of shipping low-level radioactive waste to the Nevada Test Site (NTS) under the preferred and ORNL alternatives, the NTS is preparing a site-wide environmental impact statement and has included waste generated from the Mo-99 mission in the quantities and description of materials to be stored on the site. The Department believes that any uncertainty surrounding NTS's ability to accept the waste from the Mo-99 mission is sufficiently small that there will not be an impact on a proposed Mo-99 program. The ultimate disposition of waste generated under the proposed project may change based on future decisions resulting from the DOE Waste Management Programmatic Environmental Impact Statement.

- 4 The purpose of the meeting held on February 13, 1996, at DOE Headquarters in Germantown, Maryland, was to discuss the Department's desire to privatize isotope production and distribution functions and to answer questions on that subject from industry representatives. No questions were raised regarding the Department's proposed Medical Isotopes Production Project.

1 | It seems to me that the analysis for taking this action is somewhat incomplete. In other words, I would like to see a better argument based on the history of the continuous operation in Canada, continuous supply from Canada, alternative sources that could be used in short-term emergency situations. In other words, a more complete analysis in order to justify the decision for doing this.

I'd also like to understand what would happen if the Canadian production were simply to cease. Would the U.S. be in a position to supply that demand also?

2 | I also, in a second point, I feel that the justification for the preferred method is a little bit on the light side. I would like to see something in terms of a life cycle cost, something of that nature, to justify using the most expensive alternative.

3 | I also think there should be some consideration of how reliable will the U.S. methodology be, do we do ourselves a service by discouraging the Canadian enterprise by replacing a part of -- a willing part of our demand by internal sources and thus limiting their opportunities.

Responses to Transcript ORB02

- 1 Since 1993, radiopharmaceutical companies and nuclear medicine physicians in the U.S. have relied on Mo-99 from a single source, the 40-year-old nuclear reactor in Chalk River, Ontario, Canada, which produces Mo-99 for Nordion International. While Nordion has maintained a steady supply of Mo-99, a series of recent mechanical and maintenance problems with the reactor and labor disputes have nearly disrupted production a number of different times. Other smaller production facilities for Mo-99 operate in Russia, China, Australia, Belgium, and South Africa, but none of these could meet the current clinical demand for Mo-99 in the U.S. The Mallinckrodt Medical High Flux Reactor in Petten, the Netherlands, is not expected to produce Mo-99 for sale in the U.S. until late 1996 or 1997, leaving the U.S. vulnerable to a supply disruption in Canada.

Any of the DOE production alternatives could be capable of providing 100% of the current U.S. demand for Mo-99. When fully operational, a DOE facility plus the Petten reactor could meet the current U.S. demand plus the current European demand in the event that production in Canada were interrupted for an extended period of time. The alternative reactors under consideration could not individually meet the total world requirements for Mo-99.

- 2 The Department has not made a decision regarding if and where to conduct the proposed project. A preferred alternative is identified in an EIS, in essence, to tell the public which way the Department is leaning on a decision, but it does not mean that the decision has been made. Further, Council on Environmental Quality regulations require Federal agencies to identify the preferred alternative in a Draft EIS if the agency has one, and require that the agency identify a preferred alternative in a Final EIS.

The Annular Core Research Reactor/Hot Cell Facility combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.

The costs for the modification of facilities and facility operations are presented in Table 5-1 and Table 5-52. An analysis of these costs and the projected revenues specific to this proposed project will be evaluated for each alternative as information for the Record of Decision process. Since each alternative proposes the use of existing facilities and the Department is already responsible for facility-related costs such as facility decommissioning, an incremental cost analysis (rather than a life-cycle cost analysis) was considered appropriate information for the decision-making process for the proposed project.

- 3 Since it intends to be a backup to the Canadian supplier, the Department does not believe that the proposed project will limit their opportunities.

...the Mo-99 program is part of a national isotope strategy, and this strategy, the program for which is not cited anywhere in the EIS, calls for the privatization of medical isotope production as a programmatic emphasis of the DOE encouraging joint ventures, as well as private operations, and that is not an alternative that is given any consideration in the EIS.

1 The long-term objective of privatization is found in the executive summary. The options that are carried and need to be reviewed are all on government reservations, all operated by government labs. Not even the private operators of those labs are identified, much less their interest in privatization.

There is a document now referred to in the EIS as the Jupiter Report, for those who follow this project. This report also recommends privatization and finds DOE as inappropriate for long-term production of these resources. The EIS is very carefully drafted by well-skilled writers and scientists to address only near-term options and not the long-term need for these isotopes.

2 The Jupiter Report identifies a 3 to 4 billion dollar medical isotope market with a revenue stream that comes down to about 50 million dollars for the Mo-99 itself, enough to pay the cost of this operation, if cost recovery were a goal. I think that this is particularly important to address because federal dollars are so difficult to find for innovative projects.

For projects where there is a fully mature market, we should be relying on that market to drive the supply. The market has had a good deal of time. The DOE is pursuing some options, but that is not the framework within which Mo-99 is considered in the EIS, and I believe it should be. There are people independent of the pharmaceutical industry who might want to participate in those considerations.

3 The Federal Government is providing more than just tax dollars to drive this program. It is providing a site which is well buffered, and certainly in the Albuquerque area, well armored. For a process which, as the presentation indicated, has a relatively low risk compared to conventional reactors, certainly what would be called a de minimis risk, compared to a reactor 500 times the size, a 1,000 megawatt reactor.

4 Nevertheless, the industry is unwilling and unable to propose a normal public setting for the siting and operation of this facility. I think that the less generous approach would be to say that the industry is hiding behind the fences of the Federal Government because it is unwilling to address the challenge of siting a new nuclear installation, and this is the kind of installation that is likely to be successfully sited because of the relatively low operational risks and relatively low catastrophic risks that are the types of concerns raised.

Among some of the changes of note that I am concerned about in the EIS, there is now a reference to a Nevada Test Site as a repository for the low-level radioactive waste. There is no documentation to support the confirmation that there is space there. As I understand it, space is becoming

4 | increasingly limited at repositories, and Sandia Lab is considering putting some environmental restoration waste in waste management disposing units on base. That would be quite important to confirm that, indeed, the off-site capacity has been confirmed.

The EIS has chosen to eliminate any consideration of actual communities near sites and gone to a 100-mile diameter map that just shows classes of people by economy and ethnic status on a census track level. So you really can not see where the communities are, much less is there any actual dialogue with these communities.

5 | Communities are interested in being involved in discussions not just because there is a hazard but because there is something happening, and people with inquiring minds may want to know what is going on in their neighborhood. I think that these communities are treated with a very blatant disrespect by failing to identify those communities, much less indicate any communication with them.

6 | I am sensitive to the idea raised by many that the isotopes produced by this project are quite valuable, having had some medical nuclear technology applied to my shoulder after a car accident in northern New Mexico, but I do not think the Canadian and Western European suppliers represent an insecure or vulnerable source, and the Mo-99 and its associated materials must be flown around anyway by rapid scheduling of cargo flights in a very complex manner.

We are not really as vulnerable as the Department of Energy would have us believe, and indeed, the market should demonstrate a capability to take care of itself and not rely on the Federal Government.

Responses to Transcript ALA01

- 1 There has been no Mo-99 produced commercially in the U.S. since 1989. Since 1989, no private company has stepped forward to fill the void left by the shutdown of Cintichem's Mo-99 production operations. Since Mo-99 is an important medical isotope and since the private sector has thus far been unwilling to produce Mo-99, the Department has proposed to establish a production capability.

The EIS addresses only near-term options because the Department only intends to be a Mo-99 producer in the near term. The Department believes that, as stated in the Jupiter report, Mo-99 production in the long-term should be conducted by the private sector. As stated in the EIS, the Department encourages private sector production of Mo-99 and if the private sector begins reliably producing Mo-99 in the U.S., the Department will phase out its production. The Department has simply proposed to establish a production capability to act as a backup to the existing Canadian supplier, and the Department would be willing to entertain proposals to privatize part or all of its Mo-99 production capability, if it proceeds with the proposed action.

Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis. Section 2.0 of the EIS has been revised to include a discussion of the relationship between the proposed project and the National Isotope Strategy.

- 2 As discussed in Section 3.4.3 of the EIS, there are private companies outside of the pharmaceutical industry that may be interested in entering the Mo-99 production market. These companies are either investigating new technologies for Mo-99 production or are interested in privatizing the production capability that DOE may establish.

As also discussed in Section 3.4.3, the new technologies that are being investigated do not appear to hold the potential to produce 100% of the U.S. supply of Mo-99 in the near term. Therefore, these options are not considered in detail in the EIS. However, the Department will continue to monitor the progress of these new technologies and would stand prepared to phase out its production if these new technologies begin reliably producing Mo-99.

- 3 The historical difficulty in siting a new nuclear facility is quite possibly one of the factors that has kept private industry from re-establishing a Mo-99 production capability in this country.

The Department would prefer that private industry produce Mo-99 in this country, but thus far private industry has been unwilling to do so. There are private companies that are investigating new technologies for Mo-99 production, but these technologies do not appear to be sufficiently developed to be able to meet the goals of the proposed project. As stated in the EIS, the Department will phase out its production if the private sector begins reliably producing Mo-99.

- 4 The ORNL alternative and the preferred alternative both would require periodic shipments of low-level waste to the Nevada Test Site (NTS). The Nevada Test Site is preparing a site-wide environmental impact statement and has confirmed that the waste generated from the Medical Isotopes Production Project will be included in the quantities and description of materials to be stored on the site.

- 5 Throughout the EIS process for the proposed Medical Isotopes Production Project, the Department has maintained an open channel of communication with members of potentially affected groups and other interested parties. The Public Participation and Outreach section (Section 1.4) highlights the range of outreach efforts in which the Department's project representatives have engaged to assure that a full exchange of information has been achieved.
- 6 The Canadian reactor produces all of the Mo-99 used in the U.S. Unplanned reactor shutdowns can and do occur. If the Canadian reactor were to shut down today and were to be out of operation any significant period of time, the U.S. would be without a FDA-approved source of Mo-99. Other sources of Mo-99 supply are being developed, and the Department understands that there are plans to have these suppliers certified by the FDA. To the best of the Department's knowledge, even if all of these suppliers were FDA-approved and were producing Mo-99 at full capacity, they could not supply even half of the present U.S. demand. This situation may change; the Canadians may one day have two new Mo-99-producing reactors in operation, or private industry in this country may begin reliably producing Mo-99. If the Department decides to go forward with the proposed project then at some later time is convinced that a reliable supply of Mo-99 is available to the U.S. medical community, the Department will phase out its Mo-99 production.

1 | The original Draft EA should have been finalized, and a FONSI should already have been issued.
The DOE unfortunately has been hoodwinked by this tiny minority into preparing an EIS.

2 | You sit here today gathering input on an issue with no health consequences whatsoever

3 | I urge the DOE to reexamine their well-intentioned but ineffectual policy of activist appeasement
and recognize their constitutional obligation to defend the public health and welfare by resolutely
pursuing your stated course without further ado.

Responses to Transcript ALA02

- 1 As stated in the EIS, DOE prepared an environmental assessment (EA) for the proposed production of Mo-99 related isotopes using facilities at LANL and SNL/NM. Based on the EA and on comments received, the Department decided to prepare an EIS.
- 2 It is the responsibility of the Department to evaluate a proposed action to determine if there are environmental impacts or not. The results of the analysis will appear in the Final EIS and be considered for the Record of Decision.
- 3 As stated above, DOE decided that it would be appropriate to prepare an EIS for this project. The EIS process includes opportunities for public involvement in the development of the EIS.

1 | Currently, a Canadian facility supplies all of the isotopes used in North America, and there are
2 | backup supplies. In addition, the Canadians have indicated their intention to build two new
3 | production facilities to replace and supplement their existing facility.

Why is the United States Department of Energy using our tax dollars to finance an industry that is
currently and happily in private hands? We believe this is corporate welfare. That is 34 million
dollars to start with, plus 12 million dollars each year.

Also, the Draft EIS for the medical isotope facility does not mention the contamination in Tuxedo,
New York, where the Cintichem Corporation produced Mo-99 for 19 years. When the reactor was
shut down in 1989, Cintichem left a radioactive mess behind that has still not been cleaned up.

Do we want our community to take on this burden? It could happen here, especially since the DOE
plans to use Cintichem's technology. The Draft EIS needs to address this potential impact.

Responses to Transcript ALA03

- 1 The Canadian company plans to build two new reactors for Mo-99 production. However, these reactors would not be available to produce Mo-99 until at least 3 years after an agreement is reached by the involved parties to construct the two new reactors. This would mean that the new reactors would not be available until at least the year 1999. Given that the Canadians have announced plans to shut down their existing Mo-99 production reactor in 2000, the Department has proposed to establish a backup source in case the Canadian supply becomes unavailable.
- 2 One of the charters of the Department of Energy is to produce and make available radioactive isotopes for medical and scientific purposes. At present, the U.S. is totally dependent on foreign sources of Mo-99, the radioactive parent of the important medical isotope Tc-99m. A prolonged interruption in Mo-99 supply would make it impossible to conduct the more than 30 different types of diagnostic examinations that rely on Tc-99m-based radiopharmaceuticals. These examinations are conducted about 36,000 times each day in the U.S. and include bone and liver scans for cancer detection, kidney function tests, brain scans, and a variety of other clinical tests. The inability to conduct these diagnostic procedures could seriously impact the health and well-being of U.S. citizens in need of these diagnostic procedures. In addition, the practice of nuclear medicine represents a sizeable part of the U.S. health care industry. Thousands of jobs could be jeopardized by an interruption in the supply of Mo-99.

The Department has proposed the Medical Isotopes Production Project to ensure that a reliable supply of Mo-99 is available to the U.S. medical community. If the Department decides to pursue this project, the Mo-99 produced would be sold at prevailing world market rates. In so doing, the U.S. government would not artificially lower the cost paid by pharmaceutical companies for Mo-99 and would thus not artificially increase the profits realized by these companies on sales of Mo-99. Therefore, it would be incorrect to label isotope production by the Department as a subsidy to private industry or "corporate welfare."

If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage. The goal of the proposed project is to ensure that a supply of Mo-99 is readily available to the U.S. medical community.

As stated in the EIS, DOE supports the production of Mo-99 by private industry. If a private company begins reliably producing Mo-99 in the U.S., DOE will phase out its production of Mo-99.

- 3 The contamination referred to by the commentor was a result of a underground leak, not a result of the Mo-99 production process itself. At the time, the company determined that it was not financially feasible to repair the reactor and thus shut it down. The Cintichem process is significantly cleaner than the other currently FDA-approved Mo-99 production process. The other process, currently used by Nordion, generates a significant amount of liquid waste.

1 | ...we look at this project as being basically corporate welfare by providing subsidies to the nuclear medicine industry.

2 | As you can see, it is 34 million dollars, along with 12 million dollars annually, that we will be paying out of our taxes again to subsidize industry.

3 | ...people being exposed, again, mostly people of color, Native Americans and Chicanos,

Responses to Transcript ALA04

- 1 One of the charters of the Department of Energy is to produce and make available radioactive isotopes for medical and scientific purposes. At present, the U.S. is totally dependent on foreign sources of Mo-99, the radioactive parent of the important medical isotope Tc-99m. A prolonged interruption in Mo-99 supply would make it impossible to conduct the more than 30 different types of diagnostic examinations that rely on Tc-99m-based radiopharmaceuticals. These examinations are conducted about 36,000 times each day in the U.S. and include bone and liver scans for cancer detection, kidney function tests, brain scans, and a variety of other clinical tests. The inability to conduct these diagnostic procedures could seriously impact the health and well-being of U.S. citizens in need of these diagnostic procedures. In addition, the practice of nuclear medicine represents a sizeable part of the U.S. health care industry. Thousands of jobs could be jeopardized by an interruption in the supply of Mo-99.

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As stated in the EIS, DOE supports the production of Mo-99 by private industry. If a private company begins reliably producing Mo-99 in the U.S., DOE will phase out its production of Mo-99.

- 2 The estimated cost of the proposed project at each alternative facility and the assumptions on which these cost estimates are based are presented in Section 5.22. The annual operating costs shown for each alternative would be offset by revenues from medical isotope sales. The revenue generated would depend on the amount of isotopes sold and the market price of these isotopes.
- 3 The Department found that there would be small, if any, environmental impacts from the implementation of medical isotopes production at any of the alternative sites. Thus, there are not any anticipated disproportionately high or adverse impacts to ethnic minorities and disadvantaged people that would result from the implementation of the proposed project. Specifically, Section 5.21 provides a comprehensive analysis of environmental justice issues.

1

Los Alamos and Sandia have the facilities, the personnel, the procedures and the experience to perform this operation.

2

Our only concern is the fact of, and it was brought up earlier, the transport. We feel that every effort should be made to keep the transportation of the isotopes from the Sandia facility to the airport within the confines of Kirtland Air Force Base and the airport ramp.

Responses to Transcript ALB01

- 1 Comment noted.
- 2 The proposed SNL/NM alternative would use Kirtland Air Force Base roads to access the airport. It is not anticipated that public roads outside the confines of the Base would be used.

1 | Our position is in strong support of the proposed medical isotope production facility at Sandia.

2 | In July of 1995, I testified that a finding of no significant environmental impact was perfectly adequate for the proposed project at Sandia, and we are still of this opinion.

3 | It is strange that the actual Canadian operation and shipping experience and the American experience before the shutdown of the production facilities was not used in assessing environmental impact. The environmental impacts of production and shipment are well-known because both the U.S. and Canada have produced Mo-99, and one need not rely totally on the assumptions and prognostications of the EIS.

4 | The socioeconomic analysis refers only tangentially to the economic role that Sandia plays in the community of Albuquerque and fails to consider the economic impact of shutting down the ACRR. Job multiplier factors are not even mentioned in the discussion.

The same thing can be said for Oak Ridge National Laboratory, which is the economic mainstay of that community, and the economic impacts that might occur at Idaho Falls and Espanola, New Mexico.

5 | As far as the ecological impacts are concerned, although the Sandia/Kirtland Air Force Base site does include no endangered species, which the EIS says, it does abound with wildlife. It houses a number of sizable prairie dog colonies. There is a large variety of birds that winter on site or nest there year round, and both large and small mammals make their homes on the site. We do not believe that any of these would be adversely affected at all by the Mo-99 project, but their existence should be acknowledged in the EIS.

All four sites, in fact, because they contain a lot of undeveloped land, abound with wildlife and natural vegetation, and Los Alamos possibly includes archeological sites of possible significance. Again, isotope production would have no impact on any of this, but they should be included in a proper environmental impact assessment.

6 | It appears that the RADTRAN 4 LINK mode, which is the mode used when you do route-specific analysis, was not used in this analysis, although the Department of Energy has committed to route-specific transportation risk analysis. RADTRAN route-specific analyses using the LINK mode for one shipment are generally better than the aggregate mode, not only for their level of detail, but because it is easier to use.

7 | It is very difficult to understand, moreover, why the defaults in RADTRAN were used when it is very easy to put in your own numbers. Some of the numbers that came out of the RADTRAN analyses make very little sense.

7 For instance, RADTRAN 4 LINK mode runs for a Mo-99 shipment give approximately the same radiological impacts for crew and handlers whether the shipment is by truck or by air, on the order of .01 person-rem per shipment. This is consistent with the total crew impacts given this Table 5-10 where they range from 30 to 32 person-rem per year.

However, the footnotes in the tables state that the air crew impacts are from 15 to 30 times greater than the truck crew impacts, even though you have the same number of air crew, roughly the same three as the truck crew, and the air crew are, in fact, further from the source than the truck crew are. It is not possible that the impacts would be greater.

8 The EIS implication that there will be many more shipments by air than by truck is difficult to understand, given the lifetime of these isotopes that requires them to be shipped almost immediately to the distributors. The implication is also inconsistent with the shipments per year column which shows 3225 shipments per year from the separation facility to the airport followed by 1100 for the by-air and 1040 for the by-truck shipments each year to Boston, Chicago and St. Louis. We do not know where the 3225 came from. Your numbers are inconsistent.

9 Another inconsistent set of numbers lists the one-way air distances from Albuquerque to St. Louis at 2200 kilometers while the road atlas for 1995 gives the corresponding highway miles as 1038. Is it possible that air cargo takes a more roundabout route to St. Louis than the highway route? Similarly, the numbers to Chicago do not make much sense.

There appears to be no justification for assuming that air shipments will be on passenger flights rather than cargo flights. We understand that DOE had always planned for purely cargo flights at least to ease the problems of regulatory compliance if not to actually expedite the shipments.

10 Perhaps the use of passenger flights followed from a decision to use the RADTRAN aggregate mode and defaults instead of the LINK mode. It is not justifiable on the basis of being conservative because it is just plain incorrect.

Page 5.19 implies that the greatest public impact of the entire transportation system would be to airline passengers. It is hard to imagine a public official would not decide to reduce public impacts by a factor of nearly 100 at practically no cost simply by using cargo-only shipments, no matter how small the impacts may be in any case. In this connection, a description of current operational experience with the Canadian reactor supply system would have been useful.

11 The final RADTRAN 4 default that I want to mention is the default stop time per kilometer for truck transport of .011 hours per kilometer, or .7 of a minute per kilometer regardless of the length of the trip. If you put that in the shipping from the Sandia facility to the airport, you get a ten-minute stop for what ought to be a 20-minute truck trip. That does not make any sense at all that you are going to stop for ten minutes and lengthen the trip to a half-an-hour. I would suggest that the RADTRAN analysis either be redone for the other sites, or use the one that was done for the FONSI.

12

The conclusions essentially coincide with the FONSI, and I would suggest in order to avoid delays, litigation and above all, unnecessary expense, that DOE should submit a FONSI based on the published Environmental Assessment published by Sandia and get on with preparing the production facility at Sandia.

Responses to Transcript ALB02

- 1 Comment noted.
- 2 As stated in the EIS, DOE prepared an environmental assessment (EA) for the proposed production of Mo-99 and related isotopes using facilities at LANL and SNL/NM. Based on the EA and on comments received, the Department decided to prepare an EIS.
- 3 Experience at the Cintichem facility was, in fact, used to estimate releases from the DOE target processing facility by adjusting historic emissions from the Cintichem facility to the production levels assumed for the EIS (see Section 5.7.1). Cintichem experience with shipping Mo-99 and other isotopes was also used to identify appropriate modes of shipment for the transportation analysis. Experience from the Nordion facility would be less applicable to the proposed action because the process used by Nordion is very different from that proposed by DOE. Nordion has also been consulted with regard to transportation issues.
- 4 The Department realizes the importance of all of its laboratories to their respective communities as well as the importance of maintaining the valuable technical capabilities that exist at each laboratory.
- 5 The affected environment descriptions in the EIS were intentionally limited to information that is important in evaluating relative impacts of the alternatives, and they were therefore restricted to those resources that could be most affected by the proposed action. These descriptions were also reviewed to ensure that they present a comparable level of detail for each alternative. DOE believes the information included in the EIS is presented at a level of detail appropriate to the level of risk associated with the proposed action, which is very low for all alternatives.
- 6 There is no DOE requirement to use the RADTRAN 4 link mode to calculate transportation impacts in support of NEPA documents. The aggregate data mode used in the EIS was applied using route-specific data (shipping distances, population densities, and travel fractions in rural, suburban, and urban regions) and in this sense is a route-specific analysis. Furthermore, supplementary calculations were performed to explore the effects of implementing the link mode for the Mo-99 shipments analyzed in the EIS. The results indicated that use of the link mode would not result in large differences (greater than a factor of 2) in the calculated transportation impacts, and the differences are all well within the uncertainty of the analysis. Furthermore, use of the aggregate mode does not bias the results toward any of the alternatives examined in the EIS. Thus, the Department has concluded that the value of the additional information that would be generated by a link analysis would be minimal.
- 7 The source of much of the input data for the EIS was the SNL/NM feasibility study (Massey et al. 1995). Where appropriate, input parameters were taken directly from this study. Where they were not available, default input parameters were used unless a sufficient technical basis existed elsewhere. RADTRAN 4 default parameters are believed to appropriately bound actual transport conditions such that the resulting exposures are conservative.

The results shown in Table 5-10 for Crews (as shown in the footnote) include truck crew, air crews and handlers at three hubs (i.e., origin, destination, and intermediate stop). A large portion of the air crew impacts include handlers at the three hubs.

- 8 The truck transportation analysis evaluated a total of 1140 shipments of isotopes per year. That is broken down for air shipment as follows: 345 shipments each of Mo-99, iodine-31, and xenon-133 to each of 3 distributors (3 U.S. radiopharmaceutical companies) and 35 shipments of iodine-125 to each distributor. For each isotope, 3 packages (one for each distributor) will be transported from the processing facility to the airport. Section 5.11.1.1 has been revised accordingly.

$$(3 \text{ distributors})(345 \text{ shipments})(3 \text{ isotopes}) = 3105$$

$$(3 \text{ distributors})(35 \text{ Shipments})(1 \text{ isotope}) = 105$$

Total = 3210 air shipments

The number of shipments of Mo-99 to Nordion (if Nordion were to distribute all the Mo-99) would total 1140.

- 9 The one-way air distances include an intermediate stop. For example, the flight from Albuquerque to St. Louis or Chicago includes an intermediate stop in Salt Lake City. The airline pocket guide lists the distance for the Albuquerque to St. Louis flight at 2200 km. Assuming longer flight distances adds more conservatism to the analysis.
- 10 A final decision has not been made to use cargo-only flights to support the mission described in the EIS. Ultimately, cargo air transport may be selected. However, at this time, there is no reason to believe that, technically, the shipments could not be made using passenger air flights. Assuming the isotopes are shipped by passenger air clearly establishes a bounding analysis. Also, the commercial air assumption does not bias the results toward any of the alternatives examined in the EIS.
- 11 The Department agrees that this assumption is unrealistic for very short shipping distances. The default value gives conservative stop times for long distance shipments, as well, given that most shipments of radioactive materials use two drivers and stop infrequently for only short durations along the route. It was decided to include the stop times in both short and long distance shipments to ensure that the calculated public and worker exposures are bounded and would encompass potential obstacles in transit that would require the shipment to stop or slow down, such as highway construction/repair, traffic accidents not involving the shipments, heavy traffic, and vehicle breakdowns.
- 12 As stated in comment ALB02-2 above, DOE determined that an EIS was appropriate for this proposed project.

1

...the intent is not to make a place that is already perhaps somewhat contaminated more contaminated, but instead to consider the cumulative effects of all the work that goes on and to try and keep a place from getting any worse than it already is. I do not think Kirtland is a good place to locate your reactor.

2

I think 11 million gallons of water a year is too much. We constantly read in the newspaper that if we continue to draw water from our underground aquifers, our city is going to sink, plus our water is going to be bad. There just is not enough. People are fighting over water now. They are fighting over water rights. There is not enough for Intel. There is not enough for anybody. We have already promised more water than we probably have.

A lot of people have water rights. They want to continue to own the water that they own and not have somebody come and take down the level of the aquifer where we depend on what little water there is in order to keep our forest and farms going. We have a certain life-style here that we like, and you can not take all the water out of it and expect it to go on being a place that all of us have grown to love and have chosen to live in.

There are areas that have more water than we do, and I think that one of those areas might be more appropriate for a location of this facility.

Responses to Transcript ALB03

- 1 The cumulative effects of medical isotope production, in conjunction with other ongoing or planned activities at SNL/NM, are considered in Section 5.16 of the EIS. The risks of these activities are evaluated in the EIS and were found to be very low. They would not be expected to result in any measurable residual environmental contamination that would affect the region over the long-term. The Annular Core Research Reactor (ACRR) is an existing facility; DOE is not planning to locate a new reactor at this site.
- 2 Additional water usage should have very little, if any, impact on the unconfined aquifer at SNL/NM. Although the pumping of Kirtland Air Force Base production wells and southeast Albuquerque municipal wells has created a cone of depression in the northern portion of the SNL/NM area, the amount of water being withdrawn for reactor cooling would be minimal compared to current groundwater usage at SNL/NM or in the Albuquerque region. The additional water usage at the ACRR would amount to less than 3% of current SNL/NM usage and less than 0.03% of water used in the region (see Section 5.16.1.1). Well water is drawn from highly transmissive valley fill, with pumping rates having, at maximum, a very localized effect on groundwater flow.

1

I support the selection of Sandia National Laboratories as the preferred site with target fabrication facilities at Los Alamos National Laboratories.

2

The alternative of no action is unacceptable due to the potential consequences that this choice may have on the U.S. nuclear medicine community. Considering that thousands of patients are imaged with technetium-based pharmaceuticals every day, it is essential to have a stable, reliable source of Mo-99.

Responses to Transcript ALB04

- 1 Comment noted.
- 2 Comment noted.

- 1 | Because catastrophic failure of containers is assumed to result in crew fatalities, radiological impacts to the crew were not calculated. I find this an amusing way to do math.
- 2 | In Appendix B-24, bystanders are assumed to be no closer than 325 feet from any accident, but when 3,225 shipments per year go 8.5 miles off site to a metropolitan airport, that assumption overlooks reality, in my opinion.
- 3 | On page 5.33, we see that the gamma radiation facility pool has a 5-year storage capacity that could be upgraded to 17 years. After a one-year cooling off period, waste could be moved to dry, on-site storage until some kind of other storage could be arranged, quote, that would be in accord with a future DOE decision. I am concerned about a buildup of radioactive wastes so close to our homes.

Responses to Transcript ALB05

- 1 The transportation containers used for shipping radioactive materials are required by law to be robust enough to withstand severe mechanical and thermal stresses without breaching the container or releasing the contents. As a result, any transportation accident that assumes release of radioactive materials would necessarily involve very severe mechanical or thermal stress, or both, to the vehicle. Under such conditions, it is not unreasonable to assume the driver of the vehicle would be killed in the accident and calculating radiation dose to a deceased worker would be of little value in assessing the relative risks associated with actions proposed in the EIS. Acute traffic fatalities resulting from transportation of medical isotopes and waste are included in the risks evaluated for the EIS, and although they are relatively low, any radiological accident risks are many times smaller.
- 2 The assumption regarding distance to the nearest receptor is a standard convention for transportation safety analyses, determined to some extent by limitations of the models used to estimate radiation dose to this individual. Estimating dose to an individual at a closer distance becomes highly speculative and depends on the nature of the accident, local atmospheric conditions, and the specific location of the bystander. An individual who might spend any length of time in proximity to an accident scene is likely to be an emergency worker, who could be equipped with protective gear that minimizes exposure to hazardous materials involved in the accident.
- 3 DOE's programmatic EIS for management of spent nuclear fuel (SNF PEIS [DOE 1995b]), completed in 1995, provides for interim management of all spent fuel in the DOE complex, including any generated by medical isotope production, until a decision is made concerning its ultimate disposition. That document was intended to provide for safe and secure storage of DOE's spent fuel inventory over a 40-year period at sites that have the facilities and experience to handle this material. The Record of Decision for the SNF PEIS provides for regional storage of DOE spent fuel, other than Hanford defense production reactor fuel, at either the INEL or the Savannah River site. It was DOE's intent that sites other than those designated in the programmatic EIS would not undertake long-term storage of spent fuel. Under that Record of Decision for the SNF PEIS, spent fuel from any of the medical isotope production facilities would be transferred to one of the designated regional management sites after a suitable cooling period. The transportation risks associated with such transfers were evaluated in the SNF PEIS. The logistics and timing of the shipments would be subject to arrangements between the shipping and receiving sites.

It should be noted that the spent nuclear fuel storage capacities cited in this EIS are based on the assumption that DOE might be required to replace 100% of the U.S. demand for Mo-99 over an extended period. Under anticipated conditions, the production rates would be much lower, and the quantities of spent fuel generated by the medical isotope project would be small. The intent of the EIS analysis was not to imply that spent fuel would be left at the generating sites over the indicated time periods, but to assure that the isotope production sites would be able to safely manage spent fuel before it could be transferred to the appropriate regional management site. Heat generation in the fuel elements would require that they be stored under water for a period after removal from the reactor. Subsequent transfer of spent fuel to dry storage at the generating sites before offsite shipment would have the advantages of lower maintenance requirements and additional cooling time to reduce the risks during transport.

1

I object strenuously to tax dollars being forced into this to bring up capabilities then to look at transferring those capabilities to private corporations like Lockheed where they can continue to make a profit, and I continue to pay the tax bill.

Responses to Transcript ALB06

1 Comment noted.

The Department would prefer that the private sector assume responsibility for ensuring that a reliable supply of Mo-99 is available to the U.S. medical community; however, private industry has thus far been unwilling to do so. Therefore, DOE has proposed to conduct the Medical Isotopes Production Project. If private industry is able to ensure a reliable supply of Mo-99 on its own, the Department could phase out its production activities.

One of the charters of the Department of Energy is to produce and make available radioactive isotopes for medical and scientific purposes utilizing the Department's extensive scientific and technical capabilities and facilities. At present, the U.S. is totally dependent on foreign sources of Mo-99, the radioactive parent of the important medical isotope Tc-99m. A prolonged interruption in Mo-99 supply would make it impossible to conduct the more than 30 different types of diagnostic examinations that rely on Tc-99m-based radiopharmaceuticals. These examinations are conducted about 36,000 times each day in the U.S. and include bone and liver scans for cancer detection, kidney function tests, brain scans, and a variety of other clinical tests. The inability to conduct these diagnostic procedures could seriously impact the health and well-being of U.S. citizens in need of these diagnostic procedures. In addition, the practice of nuclear medicine represents a sizeable part of the U.S. health care industry. Thousands of jobs could be jeopardized by an interruption in the supply of Mo-99.

The Department has proposed the Medical Isotopes Production Project to ensure that a reliable supply of Mo-99 is available to the U.S. medical community. If the Department decides to pursue this project, the Mo-99 produced would be sold at prevailing world market rates. In so doing, the U.S. government would not artificially lower the cost paid by pharmaceutical companies for Mo-99 and would thus not artificially increase the profits realized by these companies on sales of Mo-99. Therefore, it would be incorrect to label isotope production by the Department as a subsidy to private industry or "corporate welfare."

If the decision is made to pursue this project, the Department would act as a backup to the existing Canadian supplier. The Department would operate its facilities to produce only as much Mo-99 as is necessary to maintain the capabilities of the facility and staff to produce 100% of U.S. demand in response to an interruption of the existing supply. In essence, the project would act as an "insurance policy" for the U.S. against a Mo-99 supply shortage. The goal of the proposed project is to ensure that a supply of Mo-99 is readily available to the U.S. medical community.

The Mo-99 and related medical isotopes would be marketed through the Department's Isotope Production and Distribution Program and would be sold to intermediaries (e.g., radiopharmaceutical companies) or end users as appropriate.

As presented in Section 2 of the EIS, the Department would consider the privatization of isotope production activities if, by such action, isotope production and delivery would be enhanced. One of the Department's objectives could be to decrease the government's (and taxpayer's) cost.

1 Number one, we request that the Department of Energy provide supporting documentation that the Canadian supply for Mo-99 is not reliable. Specifically, we request a letter from the Canadian sources that stipulate that The Atomic Energy of Canada, Limited, definitely plans to shut down the Canadian reactor near the end of the century. We do not see any documentation to that effect. Nordion International and Atomic Energy of Canada, Limited, will not be able to meet U.S. demand.

Our reason for this request is that we do not believe the Department of Energy has met a sufficient burden of proof requirement that the Canadians are not able to meet U.S. needs. If the Canadians plan to meet our needs, then this project represents an unnecessary burden on American taxpayers, justifiable only as a job creation project. If a test of need is not the key reason for this project, the attendant environmental, health and safety risks that the project imposes upon the citizens of Albuquerque are unreasonable and unjustifiable.

Number 2, the Draft EIS does not cite or examine the findings of vulnerability and adverse conditions noted in DOE's Plutonium Working Group Report dated September, 1994, Volume I and II, Appendix B, Part 10, the Sandia National Laboratories site assessment team report.

2 On spent nuclear fuel on page 4.20, the Manzano Storage Structures are cited as a facility at Sandia National Laboratories for storage. Yet, it fails to discuss the unique landlord problem at Sandia Laboratories. DOE's Plutonium Working Group stated in Volume I, quote, "Storage of DOE materials in non-DOE facilities, i.e., the Nuclear Materials Storage Facility and the Manzano Facility, is a vulnerability unique to Sandia. DOE does not have control over, or ready access to, these facilities. Also, if DOE materials have to be removed on short notice, the Sandia National Laboratories may have no facilities suitable for storage."

In Volume II, it notes an additional vulnerability, the lack of safety authorization for vault storage and, quote, "no safety documentation for storage." The Albuquerque Group wonders why this DOE finding is not in DOE's Draft EIS.

3 On the hot cell facility, critical to the target processing of Mo-99 separation, the following adverse conditions are noted in Volume II, Appendix B, Part 10, pages A10 and 11, under the headings of aging, equipment failure and administrative controls. In the narrative description, seals are noted to be aging. Equipment failure of safety systems lists cranes and hoists, shielded casks. Inadequate preventative maintenance, equipment fatigue or malfunction are also cited in the working group report. Some are listed as possible vulnerabilities, others are existing.

The Draft EIS misleads readers when it does not tell the whole story but simply notes that the current configuration, quote unquote, of the hot cell would only be able to conduct limited processing activities and that a new cell would be constructed to enable steady state production of greater than 10% and up to 100% of the U.S. demand for Mo-99.

4 On the Annular Core Research Reactor critical to Mo-99 target irradiation, the in-facility adverse conditions checked off are aging and potential water sources. Aging for a facility that is 31 years with a design life of 50 years is described as materials deterioration, the lined storage vaults and the dense pack holes. The latter are stated to be even more susceptible to the effects of environment and aging.

Since the dense pack holes are located outside, there is a remote chance of water leakage into the holes either through the top of the holes or through the ground into the holes. While these may be low probability, low consequence risk, they are real, and they are supposed to be noted in the Draft EIS if they are real risks. It just shows how inadequate the Draft EIS is, if not misleading.

5 On the storage vault problems noted are inadequate seals. Also perhaps more disturbing are uncertainties or concerns regarding compensatory measures. Note the following weaknesses under the section of preventative measures. You have procedures, maintenance, surveillance, material limits, training and controlled access.

Under the section of mitigative problems, vulnerabilities and uncertainties related to emergency preparedness, emergency management, emergency planning, emergency procedures, emergency response and alarm systems. We would like these problems addressed in the EIS.

Waste stream management is a critical step in the Cintichem process approved by FDA for the production and separation of Mo-99 sold in the U.S. The Draft EIS notes that any waste generated by the Mo-99 production would be managed consistently with DOE's complex-wide Programmatic Environmental Impact Statement or known as the PEIS for waste management. The PEIS, as noted in the draft Mo-99 EIS, is still in draft form. If so, it indicates the nation's waste management problem is still not resolved.

6 The Albuquerque Group wonders about the wisdom of rushing into production on Mo-99 when the PEIS, which takes care of the waste management problem, is not even resolved yet. In this regard, the Albuquerque Group should like to call attention to one disturbing problem. DOE has made a letter public that it requested a Blue Ribbon EPA Panel to investigate charges by individuals who contributed to the drafting of the PEIS that the Programmatic Environmental Impact Statement was not a reliable document because of contractor malfeasance.

The EPA panel is on record warning the DOE that the charges raised should be taken seriously. Acting Undersecretary Tom Grumbly has released the report.

The resolution of this issue alone warrants a decision to postpone Mo-99 production in the U.S. It also suggests DOE is a long way from solving the waste management problem.

7 The Albuquerque Group holds a few additional concerns related to the production of Mo-99 in the U.S. in general, and at Sandia National Laboratories specifically. These have to do with tritium releases and air quality problems. This problem is glossed over in the draft.

- 8 | Environmental justice issues; impacts on ethnic minorities and disadvantaged people are not fully analyzed.
- 9 | Water consumption; the increased use of water, a critical and scarce natural resources in a city that has just initiated a water conservation program, needs fuller analysis.
- 10 | Accident scenarios need to be addressed as well as those mentioned in the draft. Even plane crashes need to be put in there.

Responses to Transcript ALB07

- 1 Please see response to C032-1.
- 2 Please see response to C032-2.
- 3 Please see response to C032-3.
- 4 Please see response to C032-4.
- 5 Please see response to C032-5.
- 6 Please see response to C032-6.
- 7 Please see response to C032-7.
- 8 Please see response to C032-8.
- 9 Please see response to C032-9.
- 10 Please see response to C032-10.

1 | I think that the no action is not a good way to go. I think the U.S. needs to have in their borders the ability to produce this medical isotope.

2 | I think the Canadian situation is not all that stable. I do not mean their government or anything, I mean just the fact that the government is subsidizing this to some extent, and I think it is not reasonable for us to depend upon that source.

3 | I think we would support the production with the Omega West Reactor. We have had it here for 37 years and we have lived with it and the people in town see no danger from it.

4 | I would also encourage you to go to 50% because I would like to see the government at least break even on this deal, and the Omega West Reactor could immediately do that. In fact I noticed that we could save \$2 million a year over the first selection by the operating costs of Omega West over the Sandia reactor, which would be a \$20 million savings over ten years.

5 | This project also provides an opportunity for Los Alamos to develop a process to successfully privatize this industry, thus aiding Los Alamos in obtaining the self-sufficiency that we and DOE seek. It would be an industry we could probably handle in Los Alamos quite nicely and provide a service to the nation and provide jobs in Los Alamos and Northern New Mexico, which is a region that needs jobs.

Responses to Transcript LAA01

- 1 The Department is proposing to establish a domestic production source of Mo-99 to ensure that a reliable supply is available to the U.S. medical community. The Department's concern is not that the current source of supply is a foreign source. If the Department decides to pursue this project and at some later date a reliable domestic supply could be ensured by foreign suppliers, then the Department could phase out its production of Mo-99.
- 2 Nordion estimates the total cost of their proposal to build two new reactors and a new separations facility at \$140 million. While the Department does not doubt Nordion's and the Atomic Energy of Canada Ltd.'s ability to construct the new facilities, the Department believes that it is prudent to make a comparatively small investment (around \$20 million, plus those annual operating costs not offset by revenues) to ensure a reliable supply of Mo-99 for the U.S. medical community.
- 3 Comment noted.
- 4 The Omega West Reactor, like the Power Burst Facility and the Oak Ridge Research Reactor, would have to be restarted for this project and thus does not have the capability to produce any Mo-99 immediately. The Annular Core Research Reactor is currently operational and could be used to supply a small amount of Mo-99 sooner than the other alternative reactors. All the alternatives would eventually allow the Department to produce greater than the 10%-30% U.S. demand. The purpose of the proposed action in the near term is to create a backup capability, not to create a primary source for Mo-99. Producing 10%-30% on a continual basis would provide some certainty that the alternative could meet production demands up to 100% of the U.S. demand if needed.

The Department recognizes that the estimated costs of preparation and operation of the preferred alternative are higher than for some of the other alternatives, as shown in Section 5.22. Cost estimates (including uncertainties) will be one of the factors in determining which alternative to pursue for the proposed project.

- 5 Although the potential for privatization of the proposed action in this EIS is important, the process for privatization is not part of this proposed action. Each of the production alternatives has potential for privatization. DOE has solicited expressions of interest from the industrial community for the privatization of any isotope production activity conducted by DOE, including the proposed Medical Isotopes Production Project. If promising concepts are received, the Department would seek privatization proposals on a competitive basis.

The anticipated socioeconomic impacts of the proposed project are discussed in Section 5.3 of the EIS.

1 | I strongly support the production of Mo-99 in the U.S. at whatever facility the DOE chooses.

2 | However, Sandia National Lab has been indicated in the EIS as the preferred alternative. It is not clear that the results documented in the EIS were used in making this decision. There is no reasoning for this choice presented in the document. As I read the EIS, Sandia is not supported as the preferred alternative.

3 | In particular, the stated intent of the Mo-99 production program is to be able to supply 100% of the U.S. demand for Mo-99 in the case Nordion ceases production. Although Sandia claims the shortest schedule to initial production, it is clear that this initial production does not meet the stated requirements of the project. In fact the EIS clearly shows that Sandia has the longest schedule to full production capability.

4 | In addition, Sandia is the most expensive option after just one year of operation. It also requires the most extensive facility modifications, has the least spent nuclear fuel storage capacity, creates the most waste, cannot store this low-level waste on-site, has no radioisotope production experience, does not have the chemical processing experience of the other alternatives, does not have the target fabrication capabilities of the other alternatives, requires modification of the reactor to a configuration not previously demonstrated, and finally, runs the very real risk of being usurped for defense program needs.

This last point alone seems to disqualify Sandia with regards to being able to meet the stated intent of the project.

Responses to Transcript LAB01

- 1 Comment noted.
- 2 The Chemistry and Metallurgy Research Facility at LANL is the preferred alternative for Mo-99 target fabrication, and the Annular Core Research Reactor/Hot Cell Facility (ACRR/HCF) combination at SNL/NM is the preferred alternative for target irradiation and processing for the reasons stated in Section 3.3.1.1.
- 3 The ability to produce even a small amount of Mo-99 in a short period of time is important in that, if a Mo-99 shortage were to occur in the near future, the Department would be able to supply at least a fraction of the U.S. demand. The Department has proposed the Medical Isotopes Production Project to respond to a near-term window of vulnerability in the Mo-99 supply situation; therefore, the ability to produce even a small amount of Mo-99 in a short period of time is an important factor and will be considered in the Department's decision on the proposed project. In the near term, with a single reactor producing 100% of the U.S. demand, the unavailability of that reactor for any reason would result in a Mo-99 supply shortage. The potential for such a shortage is why the ability to produce even a fraction of the U.S. demand in the near term is considered important. This would provide DOE with a Mo-99 extraction process which has met FDA approval requirements in the very near term and would be capable of providing up to 30% of the U.S. demand on an emergency basis. This early experience would also be an asset in the expansion to full-scale production capability.

As shown in Table 3-2, the preferred alternative is estimated to be the second fastest to full production, in a tie with the INEL alternative.

- 4 Each of the sites evaluated as reasonable alternatives has certain advantages and disadvantages, as documented in the EIS. These advantages and disadvantages will be considered in reaching a decision on the proposed project.

Regarding the possible diversion of the ACRR for defense use, it is possible that the ACRR, the preferred reactor for the proposed project, could be diverted to support defense missions in case of a national emergency. However, the Department has determined that the probability of needing the ACRR for defense purposes is sufficiently low to preclude disqualifying the reactor from consideration.

1 | I want the Medical Isotope Production Project to proceed.

2 | I do have one dissention. I find that the no action alternative is completely unacceptable. I want
the project to proceed here in Los Alamos.

3 | If the controversy in Albuquerque will prevent or slow this project, then I must insist that the
controversy be considered when selecting the site for the MIPP. The people against the project
operating at Sandia or against the project in any form would sing a different tune if the medicine
was needed to help save the life of one of their children.

Responses to Transcript LAB02

- 1 Comment noted.
- 2 Comment noted.
- 3 The process for preparing an environmental impact statement allows an opportunity for the public to provide the Department their comments on a proposed project. These comments are considered in reaching a decision on whether and where to conduct the proposed project.

1

First, we like the jobs up here. Second, we like the money being spent up here. Third, there is no apparent environmental risk. And fourth, I do not want to see somebody else get their reactor turned on while ours is not.

Response to Transcript LAB03

- 1 Comment noted.

1

I am, first of all, highly supportive of making the Mo-99 somewhere in this country, and I hope it goes forward somewhere.

...one of the alternatives that was not considered in the beginning for reasons that were valid at the time, the reasons have now changed, and that has to do with the Fast Flux Test Facility, FFTF.

As you probably know, at the time it was too large for the moly project by itself. The operation of FFTF could not be justified by just Mo-99, so there was a very active threat to shut it down.

Fortunately, the facility has not been removed and there is now a consortium of companies and individuals in Richland that is actively pursuing the production of a variety, not just Mo-99, but a variety of medical isotopes in the FFTF.

2

Now, even that by itself is not enough to justify operations, the cost of operation of FFTF. But now Sohinki, Director of the Reconfiguration Department, BP-25, has a study going connected with production of tritium in the FFTF, and whereas FFTF might not be able to supply 100% of the U.S. requirements, since the amount of tritium required is secret they do not know, but it would be a fair proportion, and the sale of the tritium in conjunction with or in addition to sale of the medical isotopes would indeed justify the continuation of FFTF.

The time required to get the FFTF back into operation, full operation, production, would be about three years, which looks as though it might be a little bit longer than some of the other four. But with FFTF we have a 20-year lifetime from start-up again whereas all these others are, let us face it, ancient, and would probably have a maximum of ten years. And it would also be interesting to look at the cost involved.

So I would suggest that if possible we either add the FFTF capability to this EIS or proceed however it would be best to do so, possibly in connection with the privatization effort, but to make sure this does not get lost, and that FFTF does not go down. It is unique in the world and it is something we really should preserve in this country.

Also, if we do use FFTF, we could still have Los Alamos production of the targets, at least for a while. I would like to have jobs here at Los Alamos, but I would also like to preserve our national FFTF.

Responses to Transcript LAB04

- 1 Comment noted.
- 2 The Department is conducting a study of the viability of the Fast Flux Test Facility (FFTF) for tritium production, but a decision has not yet been made. As discussed in Section 3.4, the FFTF cannot meet the selection criteria for a Mo-99 production facility. If the FFTF is restarted in response to the proposal from Advanced Nuclear and Medical Systems, the private consortium may wish to produce Mo-99 in the FFTF, and DOE would review its Mo-99 production plans and modify them if appropriate, recognizing that the FFTF cannot provide a continuous supply of Mo-99.