Statement of

Dr. John E. Cantlon, Chairman
Nuclear Waste Technical Review Board

before the

Subcommittee on Energy and Water Development
Committee on Appropriations
U.S. House of Representatives

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Mr. Chairman and members of the Subcommittee: I am John Cantlon, Chairman of the Nuclear Waste Technical Review Board. With me this morning is another member of the Board, Dr. Warner North. We are pleased to be here today to present the Board's appropriation request for fiscal year 1995.

I will begin, this morning, by briefly summarizing our appropriation request. In addition, I will outline three recommendations concerning the civilian radioactive waste management program that were included in a letter report that was submitted by the Board to the Secretary of Energy and Congress three weeks ago. A detailed document containing the specifics of our request and supporting data is attached to this statement.

Appropriation request

The Board's appropriation request for fiscal year 1995 is $2,664,000. This will partially fund the Board's activities. The balance of the funds required will come from an unobligated carryover from fiscal year 1994 in the amount of $709,000.

Background

The disposal of the country's high-level radioactive waste is an issue of long-standing importance. In 1957, the National Academy of Sciences (NAS) first examined the problems associated with waste disposal. At that time, the NAS recommended permanent isolation of the waste in mined geologic formations. There is a continuing worldwide scientific consensus that deep geologic disposal is the safest, long-term option for high-level radioactive waste disposal. It is the primary approach being pursued in the United States and in other countries.

Congress has given the Department of Energy (DOE) the responsibility for managing the

nation's high-level nuclear waste — spent fuel from civilian nuclear plants, along with some high-level defense waste from reprocessing. As directed by Congress, the DOE is characterizing a site at Yucca Mountain, Nevada, to determine its potential suitability for construction of a permanent radioactive waste repository. The Nuclear Waste Technical Review Board (Board) was created in 1987 by Congress to provide an unbiased source of expert advice on the technical and scientific aspects of the DOE's work in this area.

During its five-year review, and especially during the past year, the Board has witnessed considerable progress in the program. For example, after several delays, underground excavation of the exploratory facility at Yucca Mountain has begun, and the management and operating contractor is beginning to integrate all the components of the waste management system. The Board believes strongly that the momentum of these activities should be maintained.

The Board also has been encouraged by Secretary O'Leary's recent efforts to improve the program. For example, she has created the position of chief scientist; she is proceeding with a financial and management review of the Yucca Mountain project; and, she has taken steps toward broadening stakeholder participation in the program.

The Board is encouraged by these actions. However, we believe much remains to be done. And from comments he has made to the Board and others, it is apparent that in the very short time he has been director of the Office of Civilian Radioactive Waste Management (OCRWM), Dr. Daniel Dreyfus has recognized that a number of key issues need to be addressed in the coming months.

In an effort to provide timely and constructive comments on some of these important issues, the Board on February 24, 1994, submitted a short letter report to the Secretary and Congress. The letter report contains the following three recommendations.

Summary of Recommendations

First, the Board reiterates its recommendation of a year ago that an independent review of the entire OCRWM's management and organizational structure should be initiated as soon as possible. The review of the *project* that has been initiated by the Secretary could be part of this overall review, however, it is not an adequate substitute for the more comprehensive review of organizational structure and management of the *entire* program we are recommending.

The Board believes that such an independent review of OCRWM will provide an excellent basis for the needed reshaping of the program, regardless of future funding scenarios. Considering the proposed changes in both the method and levels of funding for the OCRWM in fiscal year 1995, this review is needed now more than ever. The Board believes that improving the program's management and organizational structure will contribute to the quality and timeliness of the scientific and technical bases for important site-characterization activities or other critical research essential to an effective program.

Such a review should not take long, nor should it require a large staff. More important,

the Board believes that program activities should not be impeded while this review is taking place. In fact, we believe that the review we have recommended could help avoid costly mistakes and actually speed real program progress.

Second, the Board believes that whether or not the program receives the funding it has requested, program management should ensure sufficient and reliable funding for site-characterization and performance assessment activities. During the past three years, the OCRWM has cited a lack of funds as the reason for postponing or slowing critical site-characterization activities, including underground excavation and surface-based testing, as well as research related to engineered barriers such as a robust, long-lived waste package. At the same time, however, the number of contract employees working on the program has continued to grow. The Board believes that relatively too little funding has been allocated to the direct costs of determining whether the Yucca Mountain site is a suitable location for a permanent repository.

Program managers need to place a greater emphasis on a number of critical activities; these include underground excavation, surface-based testing and mapping, underground thermal and corrosion testing, waste package development, and performance assessment. At the very least, sufficient monies should be guaranteed for those activities that will expedite finding any features that could disqualify the site.

Finally, the Board recommends that the OCRWM build on the Secretary's new public involvement initiative by expanding current efforts to integrate the views of the various stakeholders into the civilian radioactive waste management program during the decision-making process — not afterward.

In conclusion, Mr. Chairman, the Board recognizes that, in the United States as well as in all other countries dealing with these issues, there are no quick fixes for the challenges associated with the safe, permanent disposal of nuclear waste. With that said, however, the Board strongly believes that, no matter what future program funding trends may be, implementing these recommendations will help to achieve a more efficient and cost-effective program.

As the *only* agency charged by Congress with providing an independent review of all technical and scientific aspects of the DOE's efforts to dispose of high-level radioactive waste, the Board looks forward to continuing to report to Congress and making recommendations to the Secretary as we work together to improve progress in this important program.

Thank you.

THE NUCLEAR WASTE TECHNICAL REVIEW BOARD

Background Information

The Nuclear Waste Technical Review Board (Board) was established as an independent agency within the executive branch of the Federal government on December 22, 1987, as part of the Nuclear Waste Policy Amendments Act (NWPAA) of 1987.

The Board is charged to evaluate the technical and scientific validity of activities undertaken by the Secretary of Energy, including

(1) site-characterization activities, and

(2) activities related to the packaging or transport of high-level radioactive waste or spent nuclear fuel.

The NWPAA authorized a Board of 11 members who serve on a part-time basis; who are eminent in a field of science or engineering, including environmental sciences; and who are selected solely on the basis of distinguished service. The law stipulates that Board members shall represent a broad range of scientific and engineering disciplines relevant to nuclear waste management. Members are appointed by the President from a list of candidates recommended by the National Academy of Sciences (NAS).

On January 18,1989, eight members were appointed to the Board; an additional member was appointed in May 1990. One of the original appointees resigned in July 1991 and a replacement has not yet been appointed. Our first Chairman, Dr. Don U. Deere, left the Board when his term expired in April 1992. Three new members were appointed in 1992 resulting in the current ten members:

Dr. John E. Cantlon replaced Dr. Deere as Chairman of the Board in April 1992. Dr. Cantion is vice president emeritus of research and graduate studies and former dean of the graduate school at Michigan State University. His field of expertise is environmental science.

Dr. Clarence R. Allen is professor emeritus of geology and geophysics in the seismological laboratory at the California Institute of Technology, Pasadena.

Dr. Garry D. Brewer is dean of the School of Natural Resources and professor of resource policy and management at the University of Michigan.

Dr. Edward J. Cording is professor of civil engineering at the University of Illinois.

Dr. Patrick A. Domenico is the David B. Harris Professor of Geology at Texas A&M University, College Station, Texas.

Dr. Donald Langmuir is professor of geochemistry in the Department of

Chemistry and Geochemistry at the Colorado School of Mines in Golden, Colorado.

Dr. John J. McKetta, Jr. is the Joe C. Walter Professor of Chemical Engineering emeritus at the University of Texas, Austin.

Dr. D. Warner North is a principal of Decision Focus, Inc., in Los Altos, California; a consulting professor at Stanford University; and associate director of the Stanford Center for Risk Analysis.

Dr. Dennis L. Price is a professor in the Department of Industrial Engineering and Operations Research, and is director of the Safety Projects Office at the Virginia Polytechnic Institute and State University in Blacksburg, Virginia.

Dr. Ellis D. Verink, Jr. is a Distinguished Service Professor emeritus of Metallurgy and former chair of the Department of Materials Science and Engineering of the University of Florida, Gainesville, Florida.

The terms of four current members will expire on April 19, 1994. Also, there is one unfilled position on the Board — a radiobiology/health physics expert. Nominees to fill all five of these vacancies have been sent by the National Academy of Sciences to the White House for review.

The Board staff

The NWPAA limits the size of the Board's professional staff to ten positions, all of which are now filled. In addition, we have hired nine, full-time employees to support the professional staff and Board members. Because of the comprehensive nature of the program, the diversity of Board member experience and expertise, and the part-time availability of Board members, this small, highly qualified professional staff is employed to its fullest capacity in supporting the Board's comprehensive review of the program. The Board offices are located in Arlington, Virginia.

The Board's reporting requirements

The Board reports to the U.S. Congress and to the Secretary of Energy at least twice each year. In its past reports, the Board has made numerous recommendations to the DOE on the civilian radioactive waste management program. The DOE's responses to Board recommendations are published in subsequent Board reports.

To provide the public with information on its activities, the Board periodically publishes a newsletter, which is mailed to more than 1,500 individuals and/or groups.

Board activities

During the past five years, the Board has sponsored numerous panel meetings and technical exchanges with representatives of the DOE and its contractors, the Environmental Protection Agency (EPA), the Nuclear Regulatory Commission (NRC), the state of Nevada, the U.S. Geological Survey, the Bureau of Reclamation, Indian tribes, the utilities, and state utility regulators. Members and staff have attended a variety of relevant technical conferences, symposia, and workshops. They have participated in many field trips to examine geologic and ecological features in the state of Nevada, especially the area around the proposed repository site at Yucca Mountain.

Board and panel meetings are open to the public and are announced in the *Federal Register* four to six weeks prior to each meeting. Press releases also are issued on most of the Board's activities. The Board has held three public hearings in Nevada to solicit the views of the public on transportation of high-level radioactive waste and on the potential effects associated with repository development activities. A fourth hearing on transportation issues was held in August 1991 in Denver, Colorado. Transcripts of meetings and minutes of business sessions are available to the public through the Board's library.

The Board's review of international programs

In an effort to learn about potential ways to increase the technical validity, efficiency, and cost-effectiveness of the U.S. program, Board members and staff have examined high-level radioactive waste programs in Belgium, Canada, Finland, France, Germany, Japan, Sweden, Switzerland, and the United Kingdom. In each country, Board members met with key technical experts and heard presentations on overall program activities, ongoing research and development, transportation systems, waste packages, and public information efforts. The Board has recommended that the DOE and Congress consider some approaches used in these countries when evaluating the U.S. civilian radioactive waste management program.

Board accomplishments

The Board has provided concrete contributions to the DOE program in the form of important technical recommendations. For example:

- In response to Board and NRC recommendations, the DOE has made several important changes to its design of the exploratory studies facility (ESF). Although the DOE's proposed 25-ft-diameter tunnels are, in the Board's view, larger than required for site-suitability assessment, the new ESF design is a substantial improvement over earlier versions.

- The DOE has adopted the Board's recommendation to use tunnel boring machines (TBMs) for excavating exploratory tunnels. As compared with proposed drilling and blasting, TBMs cause less rock disturbance of the tunnel walls, are less costly per tunnel mile, and excavate considerably faster.

- The thermal-loading strategy selected by the DOE will directly affect the final repository design and will have important implications for all aspects of the waste management system from storage through disposal. Based on a Board recommendation, the DOE management and operating (M&O) contractor is evaluating alternative thermal-loading strategies to determine how they could potentially affect the repository and the waste management system.

- The Board has repeatedly urged the DOE to develop a robust, long-lived waste package that will work together with geologic barriers to provide long-term isolation of the radioactive waste from the accessible environment. Also, the use of such waste packages should facilitate repository licensing and can help improve confidence in the long-term performance of a repository. The M&O contractor has begun to evaluate the potential contributions of such long-lived waste packages.

- The Board also has recommended that the DOE develop a waste management system that will minimize as much as possible the number of times waste will be handled, especially when shielding from high-level radiation is required. For example, the use of a multipurpose cask system, in which the waste can be stored, transported, and disposed, could result in much less handling than called for in the DOE's current baseline plan. The DOE is currently evaluating such a system.

- The Secretary of Energy has indicated that the DOE will emphasize intermediate goals and that efforts to adhere to final deadlines will not compromise technical requirements. This was one of the recommendations contained in the Board's March 1993 *Special Report to Congress and the Secretary of Energy.*

One very important role the Board plays is that of catalyst for the technical community.

By scheduling meetings and asking questions, the Board is able to affect the DOE's technical and scientific program as it unfolds. The Board helps the DOE to continuously evaluate its own activities; to examine the fundamentals of the program; and to set priorities and define the program's technical objectives. The Board also has been instrumental in increasing communication and promoting cooperation within the DOE and among the DOE contractors and other organizations involved with high-level waste disposal issues.

Drawing on the significant expertise of its members, consultants, and professional staff, the Board has provided an in-depth review of the technical aspects of the DOE's waste management program in other areas, including seismology, hydrology, geochemistry, risk and performance assessment, and public health and safety.

Focus of future activities

There are several important issues to which the Board will turn its attention in the near future. Among these are:

- a continuing evaluation of efforts under way at the Yucca Mountain site to begin construction of the underground exploratory studies facility;
- a review of spent fuel storage options in view of possible repository and MRS schedule delays;
- monitoring progress in the DOE's implementation of top-level system studies;
- a review of the DOE environmental program at the Yucca Mountain site;
- a review of the DOE drilling and testing priorities during characterization of the Yucca Mountain site;
- a consideration of the impacts of the disposal of defense waste on the repository system;
- following the evolution of the radiation safety standard and its current review by the NAS; and
- a review of other technical topics, including issues related to the engineered barrier system and the potential effects of changes in climates on the site.

As the only agency providing an independent review of *all* technical and scientific aspects of the DOE's efforts to dispose of high-level radioactive waste, the Board believes it has a continuing and vital role to play in the progress of this important program.

Budget Request and Justification

The Board's funding requirement for fiscal year 1995 is in the amount of $3,373,000. The Board's request for appropriation is $2,664,000, with the remainder of the need being filled by a $709,000 unobligated balance carryover from fiscal year 1994. This carryover resulted primarily from cost avoidance related to unfilled Board member and staff positions, and the travel and support expenses associated with these vacancies.

Historically, the Board funding has been satisfied by a combination of appropriated new budget authority and carryover funds from prior years. Appropriation language provides that funds will "remain available until expended," and carryover has remained available for use in future years. Consequently, each budget year the Board has requested only that new budget authority (appropriation) needed, which when supplemented by carryover, has met its funding needs.

A detailed breakdown and justification of this request by object class follows.

Object Class 11.1 - Full-time staff - $1,445,000

The amount requested for full-time permanent staff represents the requirement to fund 22 positions. Because the technical and scientific evaluations of the Board are conducted by Board members themselves, the Board's enabling legislation provides that the Chairman may appoint and fix the compensation of not more than 10 professional staff members. This request plans the use of all 10 positions under this authority.

The Chairman is authorized to appoint such clerical staff as may be necessary to discharge the responsibilities of the Board. The remaining twelve positions are support staff engaged in clerical, secretarial, administrative, publications, public affairs, and meeting logistics requirements for the Board. This estimate assumes a 2.6% COLA and a 2.11% locality raise in January 1995.

Object Class 11.3 - Other than full-time permanent staff - $558,000

The amount requested in this category represents compensation to Board members and compensation for the employment of experts and consultants.

Each member of the Board will be compensated at the rate of pay for level III of the Executive Schedule ($485/day) for each day the member is engaged in work for the Board. It is estimated that during the year each member will attend 4 full Board meetings, 4 panel meetings, and 4 other meetings or field trips. This estimate represents 80 workdays for each member during fiscal year 1995. Furthermore, it is expected that the Chairman will spend an additional 26 days conducting Board business. This estimate assumes a 2.6% COLA in January 1995.

Also included in this object class are an estimated 300 consultant days required to support the

Board, its panels, and the professional staff. These consultants Will be hired under the authority provided by the Board's enabling legislation, which permits the Board to pay such experts and consultants up to the daily rate of level IV of the Executive Schedule ($443/day).

Object Class 11.5 - Other personnel compensation - $30,000

The amount provided in this area covers approximately 400 hours of staff overtime and performance awards under the OPM-approved Performance Management System. Most Board and panel meetings require considerable overtime to handle preparation and on-site meeting logistics.

Object Class 11.8 - Special personnel services payments - $10,000

The amount requested in this area will support the use of reimbursable details from other government agencies.

Object Class 12.1 - Civilian personnel benefits - $331,000

The estimate in this category represents the government's contribution for employee benefits at the rate of 20% for staff (a mid-range estimate between CSRS and FERS employees) and 7.65% for members and consultants hired as special government employees.

Object Class 21.0 - Travel - $334,000

The amount requested for this object class includes travel costs for the members, staff, and consultants to attend Board and panel meetings, other meetings to acquire technical and scientific data (including professional meetings and conferences), and/or site visits to review activities within the scope of the Board's mission. It is expected that members will attend 4 Board and 4 panel meetings, and will make 4 other trips during the year with an average length of 4 days each, including travel time. It is anticipated that each of the 10 professional staff members will travel on similar activities an average of 10 trips during the year with an average of 5 days per trip. Finally, consultants, for whom the Board reimburses travel expenses, are estimated to make a total of 24 trips, which include attending many of the Board and panel meetings.

Object Class 23.1 - Rental payments to GSA - $232,000

The estimate for this object class represents the amount the Board will pay to the General Services Administration for office space rental totalling 6,040 sq. ft. at an annual rate of $38.43 per sq. ft.

Object Class 23.3 - Communications, utilities, misc. - $61,000

The requested amount represents estimates for telephones, postage, express intercity delivery service, local delivery service, FTS - long distance telephone service, and mailing services related to management and use of the Board's mailing list. Since Board members are located throughout the country, it is important to distribute information to them on a timely basis. Also, intercity delivery service is a critical link in this communication network. Additionally, costs are incurred to ship materials to the many meetings held at locations throughout the country.

Object Class 24.0 - Printing and reproduction - $33,000

The major items in this object class are copier maintenance, the publication of semi-annual and special reports to Congress and the Secretary of Energy, *Federal Register* publication of meeting notices, the production of press releases announcing meetings, and the printing and distribution of a newsletter and other informational materials for Board members and the public.

Object Class 25.1 - Consulting services - $80,000

The Board estimates it will contract with technical consultants to provide expertise currently not available from the members and professional staff.

Object Class 25.2 - Other services - $129,000

The major items in this category include court reporting services for an estimated 15 Board or panel meetings, meeting room rental and related services, maintenance agreements for equipment, computer network software maintenance, and miscellaneous supplies and services from commercial sources.

Object Class 25.3 - Services from other Government agencies - $66,000

This category includes GSA administrative support services (payroll, accounting, personnel, etc.), audit services from the GSA Inspector General, security clearances through the Office of Personnel Management, and miscellaneous other interagency agreements.

Object Class 26.0 - Supplies and materials - $44,000

Anticipated expenses include routine office supplies, subscriptions and library materials, costs for off-the-shelf technical reports and studies, and ADP software.

Object Class 31.0 - Equipment - $20,000

This estimated amount represents minimal purchases of furniture and the replacement and upgrade of computer components of the office automation network.

Summary of Request

In summary, the Board's funding requirement for fiscal year 1995 of $3,373,000 has been developed using the assumption of an 11-member Board operating with a targeted staffing level of 22. *It is proposed that the funding needs be met by:*

(1) a $2,664,000 appropriation, and

(2) $709,000 of fiscal year 1994 unobligated balance carryover.

The guiding motives underlying the budget request are:

(1) To support the efforts of the Board members who will be heavily involved in a peer review process of DOE's technical and scientific activities.

(2) To maintain a professional and support staff of the highest caliber commensurate with the status and abilities of the Presidentially appointed Board, which it supports.

(3) To provide the tools and the resources for the Board and staff to effectively pursue the mission with which Congress has charged the Board.

The mission of the Nuclear Waste Technical Review Board deserves and requires the talent and reputation of individuals whose judgment and recommendations will be respected throughout the scientific community and by the public. Appointed Board members fill these needs. If these talents are to be effectively used, the Board will need a commensurate level of staff, consultant, and resource support.

NUCLEAR WASTE TECHNICAL REVIEW BOARD

Salaries and Expenses

(Including Transfer of Funds)

For necessary expenses of the Nuclear Waste Technical Review Board, as authorized by Public Law 100-203, section 5051, $2,664,000, to be transferred from the Nuclear Waste Fund and to remain available until expended.

(Energy and Water Development Appropriation Act, 1994)