



Department of Energy

Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

FEB 04 1999



VIA HAND DELIVERY
CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Benito Garcia, Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo St., Building A
P. O. Box 26110
Santa Fe, NM 87505

Dear Mr. Garcia:

Subject: Los Alamos National Laboratory (LANL), Federal Facility Compliance Order (FFCO), October 4, 1995, Section V.B.

The purpose of this letter is to report the results of a Department of Energy (DOE) and University of California (UC) Sort, Survey, and Decontamination (SSD) project and to request that the items found to be free from DOE added radioactivity be considered hazardous waste without a radioactive component. It is intended that the information provided meets the requirements under Section V.B of the FFCO for the New Mexico Environment Department (NMED) to consider such waste a covered waste for a period of ninety days upon approval by NMED of Respondents' written determination.

The total number of items determined by DOE and UC to be free from DOE added radioactivity is 532, with a total volume of 3.04 cubic meters. During this project and subsequent data review, 68 items with a total volume of 0.08 cubic meters were newly found. DOE and UC are preparing to propose these items for addition in the next annual revision. These items are, however, included in this proposal and will not be proposed for addition to the STP if NMED approves the written determination that they do not contain a radioactive component.

All waste items included in this study are confirmed to have a treatment and disposal option as hazardous waste. Within 90 days of NMED's approval of this package, all waste items will be shipped to an off-site commercial facility for treatment and disposal.

Enclosed is a detailed report discussing the results of the SSD project. DOE and UC are available at NMED's request to discuss the report further. Also enclosed is a Certification Statement prepared in accordance with the requirements of Section XX, "Documents, Information, and Reporting," of the FFCO. Please contact me at (505) 665-5042 or Beverly Martin at (505) 665-0714 if you have any questions.

Sincerely,

[Signature]
H. L. "Tody" Plum
Office of Environment

LAAME:3JP-102

Enclosures



1936

Read L AND FFCO/99

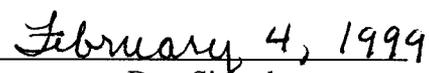
CERTIFICATION

LOS ALAMOS NATIONAL LABORATORY (LANL) FEDERAL FACILITY COMPLIANCE ORDER (FFCO) SECTION V.B OCTOBER 4, 1995

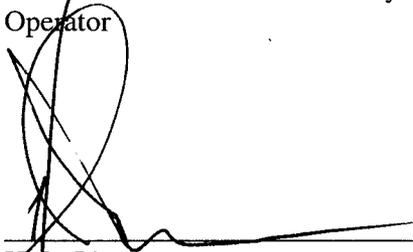
I certify that I am the project manager responsible for overseeing the implementation of the Site Treatment Plan for the Los Alamos National Laboratory. To the best of my knowledge and belief, the information in this document is true, accurate, and complete.



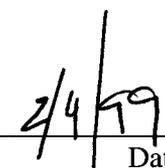
Beverly Martin
STP Project Manager
Waste Management Program
Environmental Management Programs
Los Alamos National Laboratory
Operator



Date Signed



H. L. Plum
Regulatory Permitting and Compliance Manager
Los Alamos Area Office
U.S. Department of Energy
Albuquerque Operations
Owner/Operator



Date Signed

U.S. Department of Energy
Washington, D.C.

PAGE CHANGE

DOE 5400.5 Chg 1

6-5-90

SUBJECT: RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT

1. PURPOSE. This Page Change transmits revised pages to DOE 5400.5, RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT.
2. EXPLANATION OF CHANGE. To update submittal dates for compliance certifications or implementation plans and correct typographical errors on three pages.
3. FILING INSTRUCTIONS.

<u>a. Remove Page</u>	<u>Dated</u>	<u>Insert Page</u>	<u>Dated</u>
1	2-8-90	1	6-5-90
2	2-8-90	2	2-8-90
II-5	2-8-90	II-5	2-8-90
II-6	2-8-90	II-6	6-5-90
II-9	2-8-90	II-9	6-5-90
II-10	2-8-90	II-10	2-8-90
IV-7	2-8-90	IV-7	6-5-90
IV-8	2-8-90	IV-8	2-8-90

b. After filing the attached pages, this transmittal may be discarded.

BY ORDER OF THE SECRETARY OF ENERGY:



JIM E. TARRO
Director of Administration and
Human Resource Management

DISTRIBUTION:
All Departmental Elements

INITIATED BY:
Office of Environment, Safety
and Health

*ADDED
3/16
y*

U.S. Department of Energy

Washington, D.C.

ORDER

DOE 5400.5

2-8-90

Change 1: 6-5-90

SUBJECT: RADIATION PROTECTION OF THE PUBLIC AND
THE ENVIRONMENT

1. PURPOSE. To establish standards and requirements for operations of the Department of Energy (DOE) and DOE contractors with respect to protection of members of the public and the environment against undue risk from radiation.
2. SUPERSESSON. DOE 5480.1A, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROGRAM FOR DOE OPERATIONS, of 8-13-81, Chapter XI that addressed public and environmental radiation protection standards and control practices.
3. SCOPE. The provisions of this Order apply to all Departmental Elements and contractors performing work for the Department as provided by law and/or contract and as implemented by the appropriate contracting officer.
4. IMPLEMENTING PROCEDURES AND REQUIREMENTS. This Order becomes effective 5-8-90. Within 2 months from the date of issuance of the Order (2-8-90), Heads of Operations Offices shall provide to the appropriate Program Office, with copy to EH-1 for review and comment: (1) a certification for those areas covered by the Order for which Site/Operations Offices are in compliance; and/or (2) a request for exemption for areas not yet in compliance that includes a Plan for achieving compliance. Within 3 months of issuance, the appropriate Program Office will submit to EH-1 the certification and/or the request for exemption(s). The compliance plan accompanying the request for exemption shall include schedules of activities which will lead to compliance with the requirements of this Order.
5. POLICY. It is the policy of DOE to implement legally applicable radiation protection standards and to consider and adopt, as appropriate, recommendations by authoritative organizations, e.g., the National Council on Radiation Protection and Measurements (NCRP) and the International Commission on Radiological Protection (ICRP). It is also the policy of DOE to adopt and implement standards generally consistent with those of the Nuclear Regulatory Commission (NRC) for DOE facilities and activities not subject to licensing authority.
6. OBJECTIVES.
 - a. Protecting the Public. It is DOE's objective to operate its facilities and conduct its activities so that radiation exposures to members of the public are maintained within the limits established in this Order and to control radioactive contamination through the management of real and personal property. It is also a DOE objective that potential exposures to members of the public be as far below the limits as is reasonably achievable (ALARA) and that DOE facilities have the capabilities, consistent with the types of operations conducted, to monitor routine and non-routine releases and to assess doses to members of the public.

DISTRIBUTION: All Departmental Elements

INITIATED BY:

Office of Environment, Safety
and Health

Vertical line denotes change.

b. Protecting the Environment. In addition to providing protection to members of the public, it is DOE's objective to protect the environment from radioactive contamination to the extent practical.

7. LEGISLATIVE AUTHORITY. The Atomic Energy Act of 1954, as amended, authorizes the Department to protect the health and safety of the public against radiation in conducting the Department's programs.

8. REFERENCES.

- a. DOE 1324.2A, RECORDS DISPOSITION, of 9-13-88, which prescribes policies, procedures, standards, and guidelines for the orderly disposition of records of the DOE and its operating contractors.
- b. DOE 5000.3, UNUSUAL OCCURRENCE REPORTING SYSTEM, of 11-7-84, which establishes DOE policy and provides instructions for reporting, analyzing, and disseminating information on programmatically significant events.
- c. DOE 5400.1, GENERAL ENVIRONMENTAL PROTECTION PROGRAM REQUIREMENTS, of 11-9-88, which establishes general environmental protection requirements.
- d. DOE 5400.2A ENVIRONMENT COMPLIANCE ISSUE COORDINATION, of 8-18-87, which establishes requirements for coordination of significant environmental compliance issues.
- e. DOE 5400.4, COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT PROGRAM, of 10-6-89, which establishes requirements for hazardous waste cleanup and notification.
- f. DOE Orders in the 5400 series dealing with radiological effluent monitoring and environmental surveillance, which describes requirements and provides guidance for monitoring effluents and conducting environmental surveillance.
- g. DOE 5440.1C, IMPLEMENTATION OF THE NATIONAL ENVIRONMENTAL POLICY ACT, of 4-9-85, which establishes DOE policy for implementation of the National Environmental Policy Act of 1969.
- h. DOE 5480.1B, ENVIRONMENT, SAFETY, AND HEALTH PROGRAM FOR DEPARTMENT OF ENERGY OPERATIONS, of 9-23-86, which outlines environmental, safety, and health protection policies and responsibilities.
- i. DOE 5480.4, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION STANDARDS, of 5-1-84, which identifies mandatory and reference environmental, safety, and health standards.
- j. DOE 5480.5, SAFETY OF NUCLEAR FACILITIES, of 9-23-86, which establishes nuclear facility safety program requirements.

provided in the documents Federal Guidance Report No. 11 (EPA-520/1-88-020), DOE/EH-0070 and DOE/EH-0071. Use of these factors is discussed in paragraph II.6b.

- d. Drinking Water Pathway Only, All DOE Sources of Radionuclides. It is the policy of DOE to provide a level of protection for persons consuming water from a public drinking water supply operated by the DOE, either directly or through a DOE contractor, that is equivalent to that provided to the public by the public community drinking water standards of 40 CFR Part 141. These systems shall not cause persons consuming the water to receive an effective dose equivalent greater than 4 mrem (0.04 mSv) in a year. Combined radium-226 and radium-228 shall not exceed 5×10^{-9} $\mu\text{Ci/ml}$ and gross alpha activity (including radium-226 but excluding radon and uranium) shall not exceed 1.5×10^{-8} $\mu\text{Ci/ml}$.
- (1) DOE Drinking Water Systems. The dose limit is consistent with the drinking water criteria in 40 CFR Part 141, "National Interim Primary Drinking Water Regulations (Safe Drinking Water Act)."
 - (2) Dose Components. The dose limit is the effective dose equivalent to individuals whose exclusive source of drinking water contains a radionuclide, or a mixture of radionuclides, at a monthly average level of four percent of the appropriate DCG value. For simplicity, it is assumed that site workers are also exposed to four percent of DCG values or the radium and gross alpha levels in II.1d for drinking water while away from the DOE site.
 - (3) Impact on Other Systems. The liquid effluents from DOE activities shall not cause private or public drinking water systems downstream of the facility discharge to exceed the drinking water radiological limits in 40 CFR Part 141.
2. THE ALARA PROCESS. Field Elements shall develop a program and shall require contractors to implement the ALARA Process for all DOE activities and facilities that cause public doses.
- a. Considerations. ALARA requires judgment with respect to what is reasonably achievable. Factors that relate to societal, technological, economic, and other public policy considerations shall be evaluated to the extent practicable in making such judgments. Factors to be considered, at a minimum, shall include:
- (1) The maximum dose to members of the public;
 - (2) The collective dose to the population;

- (3) Alternative processes, such as alternative treatments of discharge streams, operating methods, or controls;
- (4) Doses for each process alternative;
- (5) Costs for each of the technological alternatives;
- (6) Examination of the changes in cost among alternatives;
- (7) Changes in societal impact associated with process alternatives, e.g., differential doses from various pathways.

b. Evaluations. A quantitative cost-benefit analysis (e.g., optimization) could be performed, given the results of the considerations noted in paragraph II.2a, above. However, the parameters needed to evaluate the cost-benefit analyses are difficult to quantify, and evaluations themselves can be expensive. Furthermore, the evaluations include many additional assumptions, judgments, and limitations that are often difficult to reflect as uncertainties in the analyses. Therefore, except for meeting requirements of the National Environmental Policy Act, qualitative analyses are acceptable, in most instances, for ALARA judgments, especially where potential doses are well below the dose limit. The bases for such judgments should be documented. More detailed analyses should be considered if the decisions might result in doses that approach the limit.

3. MANAGEMENT AND CONTROL OF RADIOACTIVE MATERIALS IN LIQUID DISCHARGES AND PHASEOUT OF SOIL COLUMNS. In addition to the requirement to limit dose to members of the public (onsite or offsite) in accordance with the standards established in paragraphs II.1a and II.1d, further controls are imposed on liquid releases to protect resources such as land, surface water, ground water, and the related ecosystems from undue contamination. DCGs are not release limits, but rather are screening values for considering BAT for these discharges and for making dose estimates. The following requirements apply at the point of discharge from the conduit to the environment.

a. Discharges of Liquid Waste to Surface Waters.

- (1) Discharge at Greater Than DCG Level. For liquid wastes containing radionuclides from DOE activities which are discharged to surface water, the best available technology (BAT) is the prescribed level of treatment if the surface waters otherwise would contain, at the point of discharge and prior to dilution, radioactive material at annual average concentrations greater than the DCG values in liquids given in Chapter III. The BAT selection process shall be

Vertical line denotes change.

to the respective Operations Office manager and updated annually, consistent with the provisions of DOE 5820.2A for preparing and updating Waste Management Plans.

- (2) Prohibition of New or Increased Discharge Quantities and New Soil Columns. Except as permitted by the provisions in paragraph II.3e(1), new or increased discharges of radionuclides in liquid waste to active soil columns and virgin soil columns shall be prohibited after the effective date of this Order.
- c. Management of Soil Columns, Natural Drainage Systems, and Ground Water at Inactive Sites Previously Contaminated with Radioactive Material.
- (1) Inactive Receptors. Contaminated soil columns, drainage systems, and ground water to which contaminated liquid discharges have been discontinued shall be managed or decontaminated pursuant to the procedures and requirements of DOE 5480.4 and in the 5400 series.
 - (2) Discharge of Other Liquids. Liquid discharges, even though uncontaminated, are prohibited in inactive release areas to prevent the further spread of radionuclides previously deposited.
- d. Discharges of Liquid Waste to Sanitary Sewerage. The BAT selection process shall be implemented if liquid wastes discharged from DOE activities into sanitary sewerage contain radionuclides at concentrations, averaged monthly, would otherwise be greater than five times the DCG values for liquids given in Chapter III at the point of discharge. That is, the BAT selection process shall be implemented if the total of the fractions of the average concentrations for each radionuclide to its respective DCG value would otherwise exceed 5.
- (1) Discharges to public sewers should be coordinated with the operators of the waste water treatment works.
 - (2) Concentrations shall be controlled so that long-term buildup of radionuclides in solids will not present a handling and disposal problem at sewage disposal plants.
 - (3) Liquid wastes containing concentrations or quantities of radioactive materials that, when averaged monthly, are greater than those specified in paragraph II.3d may be discharged into a chemical or sanitary sewerage system (e.g., systems with drain fields excepted) if the system is owned by the Federal Government. However, ALARA process considerations are required. Such a sewerage system will provide liquid waste treatment prior to discharge to surface waters in accordance with the requirements of paragraph II.3a(1).
 - (4) Operators should ensure that the total annual discharge of radioactive material to the sanitary sewer system will not cause

exposures to members of the general public that will result in doses exceeding a small fraction of the basic annual dose limit.

e. Exceptions for Liquid Waste Control Requirements.

(1) Interim Control Strategies. Operations Offices responsible for DOE activities that cannot comply, when this Order is issued, with requirements shown in paragraph II.3, shall develop an interim control strategy with adequate documentation identifying the alternatives considered and evaluations thereof. Such interim control strategies shall be adopted and implemented under the provisions of DOE 5820.2A, Chapter III, paragraph 3a(2), within 6 months of the issuance of this Order, and shall be reevaluated every two years thereafter.

(2) Tritium Control. There is no practicable technology available for removing tritium from dilute liquid waste streams. Therefore, process alternatives that reduce the amount of tritium entering the liquid waste streams shall be identified and evaluated in accordance with the DOE ALARA policy. Tritium decay in transit in confined ground water may be an acceptable alternative to direct release to the atmosphere or to surface waters. A description and summary of the alternatives considered in the control of tritium releases shall be incorporated into the site Waste Management Plan required by DOE 5820.2A.

4. MANAGEMENT OF LOW-LEVEL RADIOACTIVE SOLID WASTE. The requirements for the management of low-level wastes are presented in DOE 5400.1 and DOE 5820.2A. Design, operational, and monitoring requirements for disposal of solid low-level waste containing no constituents regulated by The Resource Conservation and Recovery Act (RCRA) are addressed in DOE 5820.2A.

5. RELEASE OF PROPERTY HAVING RESIDUAL RADIOACTIVE MATERIAL.

a. Release of Real Property. Release of real property (land and structures) shall be in accordance with the guidelines and requirements for residual radioactive material presented in Chapter IV. These guidelines and requirements apply to both DOE-owned facilities and to private properties that are being prepared by DOE for release. Real properties owned by DOE that are being sold to the public are subject to the requirements of Section 120(h) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended, concerning hazardous substances, and to any other applicable Federal, State, and local requirements. The requirements of 40 CFR Part 192 are applicable to properties remediated by DOE under Title I of the Uranium Mill Tailings Radiation Control Act (UMTRA).

b. Release of Personal Property. Personal property, which potentially could be contaminated, may be released for unrestricted use if the results of a

- 5/ The amount of removable material per 100 cm² of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm² is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.
- 7/ This category of radionuclides includes mixed fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.

b. Application of Authorized Limits. Remedial action shall not be considered complete until the residual radioactive material levels comply with the authorized limits, except as authorized pursuant to paragraph IV.7 for special situations where the supplemental limits and exceptions should be considered and it is demonstrated that it is not appropriate to decontaminate the area to the authorized limit or guideline value.

6. CONTROL OF RESIDUAL RADIOACTIVE MATERIAL. Residual radioactive material above the guidelines shall be managed in accordance with Chapter II and the following requirements.

- a. Operational and Control Requirements. The operational and control requirements specified in the following Orders shall apply to interim storage, interim management, and long-term management.
- (1) DOE 5000.3, Unusual Occurrence Reporting System
 - (2) DOE 5440.1C, Implementation of the National Environmental Policy Act
 - (3) DOE 5480.4, Environmental Protection, Safety, and Health Protection Standards
 - (4) DOE 5482.1B, Environmental, Safety, and Health Appraisal Program
 - (5) DOE 5483.1A, Occupational Safety and Health Program for DOE Employees at Government-Owned, Contractor-Operated Facilities
 - (6) DOE 5484.1, Environmental Protection, Safety, and Health Protection Information Reporting Requirements
 - (7) DOE 5820.2A, Radioactive Waste Management.

b. Interim Storage.

- (1) Control and stabilization features shall be designed to provide, to the extent reasonably achievable, an effective life of 50 years with a minimum life of at least 25 years.
- (2) Controls shall be designed such that Rn-222 concentrations in the atmosphere above facility surfaces or openings in addition to background levels, will not exceed:
 - (a) 100 pCi/L at any given point;
 - (b) An annual average concentration of 30 pCi/L over the facility site; and
 - (c) An annual average concentration of 3 pCi/L at or above any location outside the facility site.
 - (d) Flux rates from the storage of radon producing wastes shall not exceed 20 pCi/sq.m-sec., as required by 40 CFR Part 61.
- (3) Controls shall be designed such that concentrations of radionuclides in the groundwater and quantities of residual radioactive material will not exceed applicable Federal or State standards.
- (4) Access to a property and use of onsite material contaminated by residual radioactive material should be controlled through appropriate administrative and physical controls such as those described in 40 CFR Part 192. These control features should be designed to provide, to the extent reasonable, an effective life of at least 25 years.

c. Interim Management.

- (1) A property may be maintained under an interim management arrangement when the residual radioactive material exceeds guideline values if the residual radioactive material is in inaccessible locations and would be unreasonably costly to remove, provided that administrative controls are established by the responsible authority (Federal, State, or local) to protect members of the public and that such controls are approved by the appropriate Program Assistant Secretary or Director.
- (2) The administrative controls include but are not limited to periodic monitoring as appropriate; appropriate shielding; physical barriers to prevent access; and appropriate radiological safety measures during maintenance, renovation, demolition, or other activities that might disturb the residual radioactive material or cause it to migrate.