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CERTIFICATION DOCKET  
FOR  
COLUMBIA UNIVERSITY  
NEW YORK, NEW YORK

Department of Energy  
Office of Nuclear Energy  
Office of Terminal Waste Disposal and Remedial Action  
Division of Remedial Action Projects

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Certification Docket  
Columbia University  
New York, New York

Introduction

The Department of Energy (DOE), Office of Nuclear Energy, Office of Terminal Waste Disposal and Remedial Action, Division of Remedial Action Projects (and/or predecessor agency, offices and divisions) has reviewed the past activities of the Manhattan Engineer District (MED) at the Columbia University, New York, New York, and has visited the site to assess the radiological conditions at the site. DOE has determined that the contamination caused by the MED has been adequately decontaminated within current radiological guidelines and standards<sup>1</sup> by the University and that this site requires no remedial action. Therefore, this site is not being considered for inclusion in the Formerly Utilized Sites Remedial Action Program.

Purpose

The material in this docket consists of documents supporting the certification that the radiological conditions at the Columbia University site are in compliance with current radiological guidelines and standards determined to apply to this site and provides assurance that use of these areas will not result in any measurable radiological hazard to the general public.

The certification docket will be archived by the Department of Energy through the Assistant Secretary for Management and Administration. Copies of this docket will be maintained by the Department at the DOE Reading Room in Washington, D.C., so that it will be accessible to members of the general public.

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<sup>1</sup> U.S. Department of Energy Interim Residual Contamination and Waste Control Guidelines for Formerly Utilized Sites Remedial Action Program (FUSRAP) and Remote Surplus Facilities Management Program (SFMP) Sites, March 21, 1984.

## Docket Contents

A brief summary of the site description, history and activities of the MED and AEC are discussed in Exhibit I of the certification package.

Exhibit II of the certification docket contains copies of reports and correspondence supporting certification, a copy of the certification statement and a copy of the Federal Register notice.

## EXHIBIT I

### Summary of Activities at the Columbia University New York, New York

#### Site Function

Columbia University was involved in nuclear research prior to the establishment of the Manhattan Engineer District. Absorption experiments to determine the feasibility of nuclear chain reactions began in 1939. In November 1940, the National Research Defense Committee contracted Columbia for additional research in this area. Columbia was a major contributor to research and development efforts throughout the early years of nuclear development under the Manhattan Engineer District and later under the Atomic Energy Commission. Research included work on isotope separation (centrifuge and gaseous diffusion), the nuclear chain reaction, and an atomic pile.

#### Site Description

Buildings utilized for the Manhattan Engineer District and the Atomic Energy Commission work at Columbia were Pupin, Schermerhorn, Havemeyer, Nash, and possibly Prentiss.

All buildings are owned by the University except Nash, which was leased for Manhattan Engineer District work reportedly involving uranium hexafluoride from 1943 to 1944.

#### Radiological History and Status

All buildings used by the Manhattan Engineer District and the Atomic Energy Commission except Nash, are currently involved in radioactive work, licensed by the Nuclear Regulatory Commission and the City of New York, and are under continuing surveillance by the University Health Physics Office. The Environmental and Safety Engineering Division has notified the Columbia

University Health Physics Office that, based upon available data and the findings of a visit by Oak Ridge Operations Office personnel, the buildings were adequately decontaminated and no radiological survey was warranted. Five buildings were investigated:

Pupin--Used for nuclear research and storage of research quantities of radioactive material.

Schermerhorn--Used for early "pile" research and gaseous diffusion research and development and operations of a barrier production pilot plant. There was no detectable contamination remaining.

Havemeyer--Contains much of the University's present radiation chemistry work. Any residual contamination attributable to the Manhattan Engineer District work would be insignificant compared to the ongoing work.

Nash--Very small-scale gaseous diffusion test cascade work. No significant potential for residual contamination exists.

Prentiss--No evidence of Manhattan Engineer District or Atomic Energy Commission experimental work being performed in this building was found. Columbia's Radiation Safety Officer made a detailed gamma survey of the building in preparation of installation of two 25-curie cesium-137 sources and observed no abnormal levels.

From the site visit, investigations, and interviews with University representatives, it was concluded that contamination caused by the Manhattan Engineer District was decontaminated by the University and no additional Department of Energy actions are warranted.

## EXHIBIT II

Documents Supporting the Certification  
of the  
Columbia University  
New York, New York

- o Keller, Charles A. (DOE) to W.E. Mott (DOE)--"Report Findings-- Columbia University," February 6, 1978.
- o Mott, William E. (DOE) to Philip M. Lorio (Columbia University)--Report on Findings of Visit to Columbia University, March 22, 1978.

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Department of Energy  
Oak Ridge Operations  
P.O. Box E  
Oak Ridge, Tennessee 37830

February 6, 1978

W. E. Mott, Director, Division of  
Environmental Control Technology  
DoE Headquarters, GTN. MS E-201

REPORT OF FINDINGS -- COLUMBIA UNIVERSITY

Enclosed is a report of the OR radiological reassessment of  
Columbia University MED areas. In our judgement, any contami-  
nation resulting from MED operations has been adequately recognized  
and decontaminated by the University, obviating the need for further  
DoE action.

During the course of this reassessment, contact has been made with  
the following persons by OR:

Mr. Philip M. Lorio  
Columbia University  
Health Physics Office  
289 Engineering Terrace  
520 West 120 Street  
New York, N.Y. 10027  
Phone: 212-280-1754, X-4442

Mr. Richard Borri  
New York City Health Department  
Bureau of Radiation Control  
325 Broadway  
New York, N.Y. 10007  
Phone: 212-526-7757

Mr. T. K. DeBoer, Director  
Technological Development Program  
State of New York Energy Office  
Swan Street Building, Core 1 Second Floor  
Empire State Plaza  
Albany, New York 12223  
Phone: 518-474-8313

*Charles A. Keller*  
Charles A. Keller,  
Assistant Manager  
for Operations

OSE:WTT

Enclosure:  
Rpt.

**COPY**

FEB 6 1978  
N 1302  
*Bill Bibb*  
R&TS



## RADIOLOGICAL REASSESSMENT FINDINGS - COLUMBIA UNIVERSITY

On August 16, 1976, OR visited Columbia University at ERDA-Headquarters request to assess the residual radioactivity from Manhattan Project operations in the early 1940's.

As a followup to the preliminary report sent to HQ by TWX from W. T. Thornton to E. K. Loop, dated September 2, 1976, the following information will further document the OR reassessment.

Five buildings have been identified based on information accumulated from the best available University sources by Philip M. Lorio, University Radiation Safety Officer. For three of the buildings, Pupin, Schermerhorn and Nash, confirmatory information on the type of operations conducted is fairly explicit in WASH-1214.

### Pupin:

According to WASH-1214, early nuclear chain reaction research was conducted at Pupin. A small University cyclotron located in Lab 128 was used to demonstrate fission for the first time in the United States. The magnet and vacuum chamber remain as a "memento" of this historic achievement. The room is currently used for storage of radioactive material associated with ongoing University programs. Lab 110 was also involved in early MED work. Traces of alpha contamination, less than  $5000 \text{ d/m-100 cm}^2$ , were measured by the RSO prior to installation of present linoleum floor covering some time ago. It appears that this was the area where very early gaseous diffusion R&D was conducted. WASH-1214 indicates a 12-stage test cascade, involving relatively small quantities of  $\text{UF}_6$ , was operated in a "wooden cabinet about eight feet square on the front face and three feet deep." The potential for contamination resulting from this operation was very small.

Other areas of this building (13th floor) were involved in pre-1940 research on radium. The RSO had, several years ago, traced residual contamination in drain pipes down through several floors, removed some piping and tagged other. According to the RSO, most of the radioactivity found during the surveys of Pupin and not related to present operations, was from this very old radium work.

Schermerhorn:

The earliest U.S. "pile" research was conducted in this building, probably in the area now identified as Lab 218-219. This work would have involved uranium-oxide; however, the scarcity of uranium at that time and the nature of the research would seem to preclude even the possibility of significant contamination. Indeed, radiation levels above background were not detected in this area. It is noted that gaseous diffusion R&D and a barrier production pilot plant operation were carried out probably in a courtyard area now used for fuel oil storage. Floor surfaces in this area are new since the MED project. No elevated radioactivity levels could be detected in this area.

Nash:

This building, located at 3280 Broadway at 133 Street, was rented by the University during 1943-44. It is not now under University control. Some work conducted in this building on a gaseous diffusion test cascade involving  $UF_6$  is reported in WASH-1214. The work was smaller in scale than the similar work being done at Pupin. It also appears that a barrier production pilot plant was operated at Nash which, of course, would not have involved radioactivity. The Nash building is a large five-story structure currently used for a variety of light industrial operations. Since the potential for contamination during operations was extremely low, the possibility of finding even measurable levels of residual contamination after 30-plus years does not seem realistic; therefore, further investigation does not seem to be warranted.

Prentiss:

No evidence has been found from discussions with University representatives or review of WASH-1214 to indicate Manhattan Project work was conducted in this building. In the course of his normal activities as RSO, Mr. Lorio, did recently, however, make a detailed gamma background survey of the building in preparation for installation of two 25 Ci  $^{137}\text{Cs}$  sources and observed no radiation of significance.

Havemeyer:

This building contains much of the University's current radiation chemistry work. It is conceivable that some lab scale Manhattan Project work was done, possibly in Lab 505 where Professor Taylor did much U-chemistry predating the Manhattan Project. The Lab was cleaned and several bottles of U-solutions discarded about three years ago. Alpha radiation levels on lab surfaces were found during our visit to be well below 5000 d/m-100 cm<sup>2</sup>.

It is apparent that any residual contamination attributable to the Manhattan Project is insignificant compared with ongoing University programs involving radioactivity. Columbia is currently licensed to utilize radioactive materials by both the NRC and the City of New York. At the time of our visit, Mr. Richard Borri of the New York City Health Department, Bureau of Radiation Control, participated and indicated satisfaction with existing controls.

Conclusion

Those instances of low level radioactivity which may have remained from Manhattan Project operation in University facilities have been, in our opinion, adequately recognized and decontaminated by the University.

Recommendation

It is recommended that the DoE reassessment of the Columbia University Site be terminated with this report.

B0059

1 - Columbia Univ ✓

*Handwritten notes:*  
Mott  
3/21/78  
WEM

MAR 22 1978

Mr. Philip M. Lorio  
Columbia University  
Health Physics Office  
289 Engineering Terrace  
520 West 120 Street  
New York, New York 10027

Dear Mr. Lorio:

On August 16, 1976, representatives of the Energy Research and Development Administration (currently the Department of Energy) visited your facility to determine whether there were conditions warranting a radiological survey of the properties utilized during the Manhattan project operations in the early 1940's.

A copy of the findings of that visit is enclosed for your information and records. Based upon these findings, it is concluded that the buildings utilized during the 1942-43 Manhattan project operations were adequately decontaminated.

It is our plan to issue a notice in the Federal Register listing all formerly utilized MED/AEC sites that have been reviewed under this program and a press release will also be made to this effect. ~~The Columbia University will be listed as one of the~~ sites reviewed and found to be adequately decontaminated.

Your assistance and cooperation in this review effort is appreciated.

Sincerely,

William E. Mott, Director  
Division of Environmental  
Control Technology

Enclosure:  
As stated

cc: R. Borri, w/encl. Rallen:le  
T. K. DeBoer, w/encl.

3/21/78

ECT *[Signature]*

ECT  
*[Signature]*  
RWRamsey

3/21/78

GC  
*[Signature]*  
WLBrown

3/21/78

ECT  
*[Signature]*  
WEMott

3/21/78

bcc *[Signature]*  
Dr. Mott

Reply: NE-24

Subject: Recommendation for Certification of Acceptable Radiological Conditions and Termination from the Formerly Utilized Sites Remedial Action Program: Bethlehem Steel Corporation, Lackawanna, New York; AI-Tech Specialty Steel Corporation (the former Allegheny-Ludlum Steel Corporation), Watervliet, New York, and offsite property in Dunkirk, New York; Hooker Specialty Chemicals Division, Hooker Chemical and Plastic Corporation (Former Hooker Electrochemical Division), Niagara Falls, New York; and Columbia University, New York, New York.

TO: William K. Voigt, Jr., Acting Director  
Office of Terminal Waste Disposal  
and Remedial Action

I am attaching for your signature the statements of certification and the Federal notice of certifications of the following sites:

- o Bethlehem Steel Corporation, Lackawanna, New York;
- o AI-Tech Specialty Steel Corporation (the former Allegheny-Ludlum Steel Corporation), Watervliet, New York, and Offsite Property in Dunkirk, New York;
- o Hooker Specialty Chemicals Division, Hooker Chemicals and Plastic Corporation (formerly Hooker Electrochemical Division), Niagara Falls, New York; and
- o Columbia University, New York, New York.

These four sites had been utilized by the Manhattan Engineer District (MED) and/or the Atomic Energy Commission (AEC) during the early years of nuclear research, development, and production. Since that time, radiological surveys and/or screening surveys have been conducted at these sites to determine the radiological conditions at these sites.

The Bethlehem Steel Corporation was under contract with AEC during the period 1949 through 1951 to roll natural uranium billets into 1-1/2 inch rods for use as reactor fuel. Screening surveys were conducted at the Bethlehem Steel plant in 1976 and 1980 by Oak Ridge National Laboratory. These surveys detected no levels of radioactivity above background levels at the facility.

The former Allegheny-Ludlum Steel Corporation processed uranium billets into solid rods under contract with AEC during the early 1950s at their Watervliet plant. In 1960, the 14-inch mill used for AEC operations was removed from Watervliet to a Dunkirk plant. On August 19, 1976, Oak Ridge National Laboratory conducted a screening survey of the former Allegheny-Ludlum Steel site in Watervliet. Later in September 1980, Oak Ridge National Laboratory conducted a survey of the remaining portions of the mill that had been relocated in Dunkirk. These surveys detected no levels of radioactivity above background levels.

The former Hooker Electrochemical Division of the Hooker Chemical Company under contract with MED from January 1943 until shortly after World War II, performed chemical processing (slag recovery) of uranium-bearing materials as a precursor to uranium recovery. A radiological survey was conducted by Oak Ridge National Laboratory in October 1976 at the Hooker Chemical Company site. The final survey report, published in January 1977, documented the residual radioactivity levels as within current Federal and state guidelines for unrestricted use.

Columbia University was a major contributor to research and development efforts during the early years of nuclear development under MED and later under AEC. Research included work on isotope separation (centrifuge and gaseous diffusion), the nuclear chain reaction, and on atomic pile. Five buildings at Columbia University were identified as used by the MED and the AEC. All buildings, except for Nash, are currently involved in radioactive work, licensed by the Nuclear Regulatory Commission and the City of New York. On August 16, 1976, Oak Ridge Operations Office personnel visited the Columbia University campus to determine if conditions warranted a radiological survey of the site. It was concluded based on this site visit and screening survey that the contamination due to MED operations was adequately decontaminated by the University and no additional actions were warranted by DOE.

Based on a review of pertinent documents, the Director of the Division of Remedial Actions Projects has determined that the conditions at these four sites are below the current criteria for remedial actions. Therefore, no remedial action is required and these sites are not to be considered for inclusion in the Formerly Utilized Sites Remedial Action Program.

Following your concurrence in the certifications, this office will notify interested state and local agencies, the public, the specific property owners of the certification actions by correspondence announcements as appropriate. The documents transmitted with the statements of certification and the Federal Register notice will be compiled in final docket form by the Division of Remedial Action Projects for retention in accordance with DOE Order 1324.2 (Disposal Schedule 25).

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J.E. Baublitz, Director  
Division of Remedial Action Projects



STATEMENT OF CERTIFICATION

Former Hooker Electrochemical Division  
Niagara Falls, New York

The Office of Terminal Waste Disposal and Remedial Action has reviewed and analyzed the final project report on radiological surveys of the former Hooker Electrochemical Division site, Niagara Falls, New York. Based on this analysis the Department of Energy certifies that the former Hooker Electrochemical Division site is in compliance with applicable radiological guidelines and standards. This certification of compliance provides assurance that the use of these properties will result in no radiological exposure above applicable criteria and standards to members of the general public or to site occupants. Therefore this site is not being considered for inclusion in the Formerly Utilized Sites Remedial Action Program.

By: \_\_\_\_\_

Date: \_\_\_\_\_

William R. Voigt, Jr., Acting Director  
Office of Terminal Waste Disposal  
and Remedial Action

DEPARTMENT OF ENERGY

Office of Nuclear Energy

Certification of the Radiological Condition  
of the Bethlehem Steel Corporation,  
Lackawanna, New York

Al-Tech Specialty Steel Corporation,  
(The Former Allegheny-Ludlum Steel Corporation),  
Watervliet, New York, and Offsite Property in Dunkirk, New York

Hooker Specialty Chemicals Division,  
Hooker Chemicals and Plastic Corporation,  
(The Former Hooker Electrochemical Division),  
Niagara Falls, New York

Columbia University, New York, New York

AGENCY: Office of Terminal Waste Disposal and Remedial Action

ACTION: Notice of Certification

SUMMARY: The Department of Energy has reviewed the past activities of the Manhattan Engineer District and/or Atomic Energy Commission and has completed radiological surveys and/or screening surveys at four sites and one associated property:

- o The Bethlehem Steel Corporation site located at 2558 Hamburg Turnpike, Lackawanna, New York;
- o The Former Allegheny-Ludlum Steel Corporation site located on Spring Street Road, Watervliet, New York, and offsite property, an AL-TECH Specialty Steel Corporation plant located on Willowbrook Avenue, Dunkirk, New York;
- o The Former Hooker Electrochemical Division site located on Buffalo Avenue, Niagara Falls, New York;
- o The Columbia University site in New York, New York.

As a result the Department, through the Office of Terminal Waste Disposal and Remedial Actions, has issued the four statements entitled:

1. STATEMENT OF CERTIFICATION, BETHLEHEM STEEL CORPORATION, LACKAWANNA, NEW YORK.

2. STATEMENT OF CERTIFICATION, AL-TECH SPECIALTY STEEL CORPORATION (THE FORMER ALLEGHENY-LUDLUM STEEL CORPORATION), WATERVLIET, NEW YORK, AND OFFSITE PROPERTY IN DUNKIRK, NEW YORK.
3. STATEMENT OF CERTIFICATION, HOOKER SPECIALTY CHEMICALS DIVISION, HOOKER CHEMICALS AND PLASTIC CORPORATION (FORMER HOOKER ELECTROCHEMICAL DIVISION), NIAGARA FALLS, NEW YORK.
4. STATEMENT OF CERTIFICATION, COLUMBIA UNIVERSITY, NEW YORK, NEW YORK.

The Office of Terminal Waste Disposal and Remedial Action has reviewed the decontamination efforts and/or surveys conducted at these four sites. Based on these reviews, the Department of Energy has certified that these sites are in compliance with applicable radiological guidelines and standards, and are released from the Formerly Utilized Sites Remedial Action Program.

FOR FURTHER INFORMATION CONTACT:

J.E. Baublitz, Director  
Division of Remedial Action Projects (NE-24)  
Office of Terminal Waste Disposal  
and Remedial Action (NE-20)  
U.S. Department of Energy  
Washington, D.C. 20545  
(301) 353-5272

SUPPLEMENTARY INFORMATION: The Department of Energy has established a program to characterize and, where necessary, correct the radiological conditions at sites formerly used by the Army Corps of Engineers' Manhattan Engineer District and the Atomic Energy Commission during the early years of nuclear research, development, and production. The ultimate objective of the program is to ensure that formerly utilized sites, and any associated properties in their vicinity, can be certified within current radiological guidelines and applicable standards established to protect the general public. The Bethlehem Steel Corporation, the former Allegheny-Ludlum Steel Corporation, the Former Hooker Electrochemical Division, and Columbia University located in New York are four of these sites.

The Bethlehem Steel Corporation during the period 1949 through 1951 was under contract with AEC to roll natural uranium billets into 1-1/2 inch rods for use in reactors. Screening surveys were conducted at the Bethlehem Steel plant in 1976 and 1980 by Oak Ridge National Laboratory. These surveys detected no levels of radioactivity above background levels at the facility.

The former Allegheny-Ludlum Steel Corporation processed uranium billets into solid rods under contract with the AEC during the early 1950's at their Watervliet plant. In 1960, the 14-inch mill was removed from Watervliet to a Dunkirk plant which was considered an offsite property in the investigation. On August 19, 1976, Oak Ridge National Laboratory conducted a radiological screening survey of the former Allegheny-Ludlum Steel site in Watervliet. Later in September 1980, Oak Ridge National Laboratory conducted a survey of the remaining portions of the mill relocated at the offsite property in Dunkirk. These surveys detected no levels of radioactivity above background levels.

The former Hooker Electrochemical Division, of the Hooker Chemical Company under contract with MED from January 1943 until shortly after World War II, performed chemical processing (slag recovery) of uranium-bearing materials as a precursor to uranium recovery. A radiological survey was conducted by Oak Ridge National Laboratory in October 1976 at the Hooker Chemical Company Site. The final survey report, published in January 1977, documented the residual radioactivity levels measured at this site are within NRC Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licences for By-Product Source, or Special Nuclear Material, USNRC (December 1975).

The Columbia University was involved in research and development efforts under MED during the early years of nuclear development and later under AEC. Buildings utilized for the MED/AEC work at Columbia included Pupin, Schermerhorn, Havemeyer, Nash, and possibly Prentiss. Research included work on isotope separation, the nuclear chain reaction, and an atomic pile. Five buildings at Columbia University were identified as used by the MED and the AEC. All buildings, except for Nash, are currently involved in radioactive work, licensed by the Nuclear Regulatory Commission and the City of New York. On

August 16, 1976, Oak Ridge Operations Office personnel visited the Columbia University campus to determine if conditions warranted a radiological survey of the site. It was determined that the site did not need remedial action.

These findings are supported by the Department of Energy's "Certification Docket for Bethlehem Steel Corporation, Lackawanna, New York," "Certification Docket for Al-Tech Specialty Steel Corporation (the Former Allegheny-Ludlum Steel Corporation), Watervliet, New York, and Offsite Property in Dunkirk, New York," "Certification Docket for Hooker Specialty Chemicals Division, Hooker Chemicals and Plastic Corporation, (Former Hooker Electrochemical Division), Niagara Falls, New York," and "Certification Docket for Columbia University, New York, New York." These dockets will be available for review between 8:00 a.m. and 4:00 p.m., Monday through Friday (except Federal holidays), at the Department of Energy's Public Document Room located in Room 1E-190 of the Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C.

Dated: \_\_\_\_\_

\_\_\_\_\_  
William R. Voigt, Jr., Acting Director  
Office of Terminal Waste Disposal  
and Remedial Action