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RICHLAND OPERATIONS OFFICE

RECORDS PRODUCED BY PACIFIC NORTHWEST NATIONAL LABORATORY

BACKGROUND MATERIALS

RADIOACTIVITY AND HEALTH: A HISTORY

9 pages

INTRODUCTION:

RICHLAND OPERATIONS OFFICE

RECORDS PRODUCED BY PACIFIC NORTHWEST NATIONAL LABORATORY

BACKGROUND MATERIALS FOR RADIOACTIVITY AND HEALTH: A HISTORY

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The Department of Energy and Its Heritage: The Department of Energy (DOE) is one of the most diverse agencies in the Federal government. It was created in 1977 from a score of organizational entities from a dozen departments and agencies. DOE encourages the development of energy technologies in several areas--solar, geothermal, fossil fuel, and nuclear. It develops technologies aimed at promoting conservation of energy resources. DOE is one of the largest Federal agency supporters of basic scientific research and manages a research complex that includes some of the nation's premier laboratories. DOE helps formulate national policies for energy use and development. Perhaps surprisingly to many, DOE also runs the nuclear weapons research, development, and production complex as well as associated dismantlement and clean up activities.

DOE's nuclear heritage comes from the World War II Manhattan Project which built the atomic bomb. The threads of DOE's involvement with nuclear issues and programs run through the following agencies: the Manhattan Engineer District (1942-1947), the Atomic Energy Commission (1947-1975), and the Energy Research and Development Administration (1975-1977). DOE not only took over functions, cultures, and traditions from these agencies, it also inherited records from them. Of these agencies, the longest lived and most controversial was the Atomic Energy Commission (AEC).

The Atomic Energy Commission: From its inception in 1947 until its abolition in 1975, the AEC carried out a Congressional mandate for a large federal role in atomic energy development.

The AEC maintained programs for nuclear weapons research, development, production, and testing; production of plutonium and weapons grade uranium; milling and refining of uranium ore; biomedical research into the effects of radiation and nuclear weapons; basic nuclear research in fields such as chemistry, physics, and metallurgy; development of nuclear reactors; promotion of a civilian nuclear power industry; and conduct of international Atoms-for-Peace activities. It was unique among federal agencies in combining responsibilities to both promote and regulate a technology.

In 1947 the AEC assumed control of research and production facilities created by the Manhattan Engineer District (MED) during World War II. The facilities were scattered from coast to coast, with the primary ones being located in Oak Ridge, Tennessee; Hanford, Washington; and Los Alamos, New Mexico. At Oak Ridge the Manhattan Project established facilities for the production of bomb grade uranium. It also had intended to build nuclear reactors for plutonium production there as well. When research showed that production reactors would generate far more heat and radioactivity than scientists had previously believed, the Manhattan Project located plutonium production facilities near Hanford, Washington. During the war the E. I. DuPont de Nemours Company built and operated Hanford plutonium production facilities for the Manhattan Engineer District.

To operate its facilities, the MED had used contractors while retaining government ownership of plants, laboratories, and buildings. The AEC continued this system of government-owned, contractor-operated (GOCO) facilities. At Hanford, DuPont pulled out as the operating contractor after the end of the war. In 1946 General Electric acquired the managing and operating contract and assumed responsibility for producing plutonium.

Pacific Northwest National Laboratory: Shortly after the MED began building plutonium production facilities at Hanford, it formed a research laboratory to support production activities. The laboratory, eventually called the Hanford Laboratories, launched programs to study radiation damage to reactor materials, to investigate fuel processing techniques, to develop processes for the removal of useful fission products from reactor wastes, and to study the biological and environmental effects of production reactor operation. Because the MED intended to place huge production reactors on the Columbia River, there was special interest in studying reactor environmental impact and effects on aquatic life, particularly since the Columbia provided drinking water and food for millions of people in the Pacific Northwest.

To investigate the biological and environmental effects of production reactors, for example, the Hanford Laboratories launched several programs. One examined the effect of the reactors on river fish and aquatic biology and another the effects on the environment of radioisotopes released routinely during reactor operation. This effort focused on the effects of iodine, tritium, radioactive particles, and plutonium on the environment and man. The Hanford Laboratories also initiated programs to study the absorption of radioisotopes through the human gastrointestinal tract and methods of treating radiation injury. Until the middle 1960s the Hanford Laboratories focused on nuclear technology and the environmental and health effects of radiation.

By this time, the AEC had met all Department of Defense requirements for nuclear weapons production and had created a huge arsenal of nuclear weapons. Accordingly, President Lyndon B. Johnson decided to reduce nuclear materials production and presented it as a disarmament measure in his 1964 State of the Union address. As a result, over the next seven years, the AEC shut down all but one of the Hanford production reactors. Because the Hanford area was a one industry town, the AEC also took steps to keep the area economically viable by aiming to bring new industry and contractors into the area. It grouped these efforts into its Hanford diversification program. In 1964 General Electric decided to withdraw from Hanford and the AEC committed to use multiple contractors at the site.

In the first major move of its Hanford diversification program, the AEC selected Battelle Memorial Institute of Columbus, Ohio to take over operation of the Hanford Laboratories, which were now renamed the Pacific Northwest Laboratory (PNL). At its inception PNL had a staff of about 1,800 and a budget of approximately $20 million.

Under Battelle management the laboratory began to grow. From a single gray barracks in downtown Richland in 1965, PNL, in ten years, had grown to include new buildings and equipment valued at $50 million. For example, in 1967 PNL began operation of a 120 square mile Arid Lands Ecology Reserve for the AEC. It established a Marine Research Laboratory on Washington's Olympic Peninsula and a research center near the University of Washington's Seattle campus. It built a Richland Research Complex which included a Research Operations Building, a Physical Sciences Laboratory, a 300 seat auditorium, a Mathematics Building, an Engineering Development Laboratory, and a Life Sciences Laboratory. In 1967 an observatory with the largest optical telescope in the Northwest was established near Richland.

The AEC, meanwhile, had decided to build the Fast Flux Test Facility (FFTF) at Richland as part of its Hanford diversification efforts. The FFTF was an advanced nuclear reactor which would be used to test fuels and materials which could be used in advanced nuclear breeder reactors. PNL was given the job of designing the FFTF and selecting engineering and construction firms to build it.

At the same time PNL was diversifying its research programs. The laboratory expanded its efforts into additional biomedical, nonnuclear energy, environmental, national security, and human affairs research. In 1969 PNL was chosen by the National Aeronautics and Space Administration to analyze lunar samples collected by the Apollo program and in 1972 PNL received lunar samples from the Apollo 15 and 17 space missions for research. In 1972 the laboratory won a prestigious award for developing a porous substance that could develop a "living union" between bone and prosthetic devices by bone ingrowth.

By 1975 PNL's work force totaled about 1142 and its annual operating budget was a little over $25 million. By this time the AEC had been replaced by the Energy Research and Development Administration (ERDA). Within two years ERDA had been replaced by the Department of Energy (DOE). PNL became first an ERDA facility in 1975 and then a DOE facility in 1977.

PNL continued its role as an expanding and diversifying facility under DOE. When Mount St. Helens erupted in 1980, PNL began collecting and analyzing ash samples to determine potential environmental and health consequences. The laboratory fabricated special bundles of reactor fuel rods to help to determine what happens to nuclear fuel rods during a reactor loss of coolant accident. PNL helped DOE to establish the first Atmospheric Radiation Measurement site to obtain data related to global environmental change. It prepared a unique booklet explaining potential radiation hazards to help the people of Enewetak Atoll to understand health risks of returning to their native islands, the site of many earlier open-air United States nuclear weapons tests. PNL used its own Grumman Gulfstream I aircraft to collect air samples of fallout from the 1986 Chernobyl nuclear reactor accident. The laboratory developed a process for encapsulating highly radioactive nuclear waste in vitrified glass and demonstrated the process on a pilot-plant scale employing spent fuel from a commercial power reactor. PNL also performed lead laboratory roles for DOE on the Aquifer Thermal Energy Storage Program, wind energy, nuclear waste materials characterization, and nuclear waste management.

By 1992 PNL employed more than 3,500 people, had an annual budget of over $500 million, and supported energy, environmental, health, educational, and national security missions. It focused on scientific research and the rapid development and deployment of technology, with an emphasis on resolving environmental issues, such as waste remediation, and global environmental change. When appropriate, PNL also performed work for other federal agencies, such as the Department of Defense, the Nuclear Regulatory Commission, and the Environmental Protection Agency. In 1995 it was designated Pacific Northwest National Laboratory (PNNL).

Pacific Northwest National Laboratory Inactive Records: PNNL has custody of inactive records created by its own organizations and by General Electric. Like the Richland Operations Office, PNNL generally controls inactive records on the box level. PNNL, however, usually retains information about the collections of which records boxes are a part. The attached Records Input/Data Transfer forms are inventories of the folders which appear in records boxes. PNNL uses them as one means of controlling its inactive records. The forms also list the organization which retired the records and indicate the larger collections of which boxes are a part.

Originally some of PNL's inactive records about site activities were classified. The Richland Operations Office has now declassified many of these older documents in response to litigation and other needs. It has placed many of these documents in its public reading room; thus, much of the contents of the boxes listed on the attached Records Input/Data Transfer forms may be available in the Richland public reading room. As soon as the documents are available, they are linked to the Hanford Home Page at http://www.hanford.gov/doe/reading.htm.

Inactive Records Produced by Pacific Northwest National Laboratory--Background Materials for Radioactivity and Health: A History: *Radioactivity and Health: A History* by J. Newell Stannard is a massive tome (published in 1988) which traces the history of our understanding of the behavior of radioactive materials in living organisms and in their environment and the gradual acquisition of knowledge regarding their effects. It was designed to be a history of research facts, measurements, and ideas and the people who developed them. In nearly 2000 pages of text, appendices, and indices, it covers these topics during the period from the late nineteenth century to the present. It is an essential work for anyone interested in virtually any aspect of radiation and its effects.

The attached Records Transfer/Data Input forms list the background materials compiled by Dr. Stannard. The collection contains material of interest to serious students of radiation and its effects as well as to others. It includes donated documents, reports, articles, and tapes and transcripts of oral history interviews. The collection is scheduled for transfer to the Richland Washington State University campus in the near future.

The box inventories may not reflect the present condition of these records.

Arranging for Access to Inactive Records Produced by Pacific Northwest National Laboratory--Background Materials for Radioactivity and Health: A History: Access to unclassified portions of these materials can be arranged under provisions of the Freedom of Information Act (FOIA). An FOIA request may be submitted, or additional information about the records obtained, by contacting the Richland Operations Office FOIA officer at:

Freedom of Information Act Officer, A7-75
U.S. Department of Energy
P.O. Box 550
Richland, WA 99352
Phone: 509-376-6216.

Some of the records on the attached box inventories may have previously been made available at the DOE reading room in Richland. These records may be reviewed and duplicated at the reading room. There is a fee for duplication. The reading room can be reached at:

DOE Public Reading Room
100 Sprout Road
Richland, WA 99352
Phone: 509-376-8583
E-mail: Reading_Room@pnl.gov

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RICHLAND OPERATIONS OFFICE

RECORDS PRODUCED BY PACIFIC NORTHWEST NATIONAL LABORATORY

BACKGROUND MATERIALS

RADIOACTIVITY AND HEALTH: A HISTORY

BOX INVENTORIES

Company	Department	Custodian/Manager	Org. Code	Date	May records be destroyed as scheduled without further concurrence?
PNL	Epidemiology & Biology	CR Watson	D7A50	5/19/93	☐ YES XX NO
	Retiring Unit and Code: same as above	Location/Bldg: 3767/3/P7-82	Phone: 6-3483	Coordinate Disposal Approval with Other RL Contractors? ☐ YES XX NO	If yes, specify contractor(s):

Box No.	Description of Records — Instruction: Type general description in capital letters and follow with detail description of contents. Also, please highlight or underline key words.	Classification (U,O,C,S)	Inclusive Dates From	Inclusive Dates To	Cubic Feet	Disposal Schedule	Retention (years)
	Background materials for RADIOACTIVITY AND HEALTH: A HISTORY by Dr. J. Newell Stannard	O	1942	1990	1.0	N1-434-89-8.1a1	Permanent
124548 X 1162	~~JNS00A~~ JNS000A; JNS0005(partial); JNS0009(partial); JNS0014	"	"	"	"	"	"
124549 X 1163	JNS0011; JNS014A; JNS0019	"	"	"	"	"	"
124550 X 1164	JNS0015	"	"	"	"	"	"
124551 X 1177	JNS0020; JNS020A	"	"	"	"	"	"
124552 X 1177	JNS0021	"	"	"	"	"	"
124553 X 1186	JNS0022	"	"	"	"	"	"
124554 X 1186	JNS0023	"	"	"	"	"	"
124555 X 1187	JNS0024	"	"	"	"	"	"
124556 X 1187	JNS0025	"	"	"	"	"	"
124557 X 1192	JNS0027	"	"	"	"	"	"
124558 X 1192	JNS0028	"	"	"	"	"	"
124559 X 1194	JNS0029	"	"	"	"	"	"
124560 X 1194	JNS0030	"	"	"	"	"	"

SPECIAL NOTE: Specific Inventory Of Boxes Is Included In The RT/DI Package Sent to the RHA

RECORDS TRANSFER/DATA INPUT	Transfer Requested By (Signature)	Records Management Approval	Data Entry	Received by RHA	Date Received
	Charles R Watson	Kathy M Schantz 5/24/93	☐ ☐ ☐ ☐	P Morrison	9-9-93

~~M07213~~ M69595

Company	Department	Custodian/Manager	Org. Code	Date	May records be destroyed as scheduled without further concurrence?
PNL	Epidemiology & Biometry	CR Watson	D7A50	5/19/93	☐ YES XX NO
	Retiring Unit and Code	**Location Bldg**	**Phone**	**Coordinate Disposal Approval with Other RL Contractors?** ☐ YES XX NO	
	same as above	3767/3/P7-82	6-3483	If yes, specify contractors	

Box No.	Description of Records Instruction: Type general description in capital letters and follow with detail description of contents. Also, please highlight or underline key words.	Classification (U,O,C,S)	Inclusive Dates From	Inclusive Dates To	Cubic Feet	Disposal Schedule	Retention (years)
124561 1195	JNS0030	O	1942	1990	1.0	N1-434-89-8.1a1	Permanent
124562 1195	JNS0032	"	"	"	"	"	"

Project Name: National Radiobiology Archives
Project # 10650
Client: DOE-OHER
Mgr: CR Watson
SCOPE: To develop a computer database, operate an information repository and tissue specimen archive for DOE-sponsored long-term animal studies

RECORDS TRANSFER/DATA INPUT	Transfer Requested By (Signature)	Records Management Approval	Data Entry	Received by RHA	Date Received
	Charles R Watson	Kathy M Schantz 5/20/93	S-8 ☐ S-9 ☐ S-10 ☐ S-11 ☐	P Morrison	9-9-93