CONF-830610--7

NOV 2

THE NEVADA APPLIED ECOLOGY INFORMATION CENTER: A REVIEW OF TECHNICAL INFORMATION SUPPORT PROVIDED TO THE NEVADA APPLIED ECOLOGY GROUP

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DE86 003311

CONFERENCE PROCEEDINGS

for inclusion in DOE NVO-272, The Proceedings of the Transuranics (and Associated Radionuclides) Information Conference, (held June 29, 1983, Las Vegas, NV)

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The Nevada Applied Ecology Information Center: A Review of Technical Information Support Provided to the Nevada Applied Ecology Group

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History

The Nevada Applied Ecology Information Center (NAEIC) was established in January 1972 to serve the needs of the Nevada Applied Ecology Group (NAEG) by identifying, collecting, analyzing, and disseminating technical information relevant to NAEG programs.

Since its inception, the NAEIC has been active in providing specialized information support to NAEG staff in the following research areas:

- environmental aspects of the transuranics,
- historic literature (pre-1962) on plutonium and uranium,
- cleanup and treatment of radioactively contaminated land,
- bioenvironmental aspects of europium and rhodium,
- NAEG contractor reports, and
- Uptake of radioactivity by food crops.

The initial efforts of the NAEIC focused on the environmental behavior of plutonium and other transuranics. Emphasis was placed on research related to the Nevada Test Site and on studies of the fate of radionuclides in the environment, with special attention on pathways to man. These studies included: (1) characterization and mobility of radionuclides in soil, (2) resuspension and redistribution of airborne particles, (3) measurement and statistical methods resulting from NAEG research, (4) ingestion of radionuclides by grazing and by burrowing animals, and (5) uptake of radionuclides by plants. Figure 1 illustrates the additions to the scope of the NAEIC in the years since its inception, as the needs and interests of the NAEG have grown.

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ORNL-DWG 83C-14106

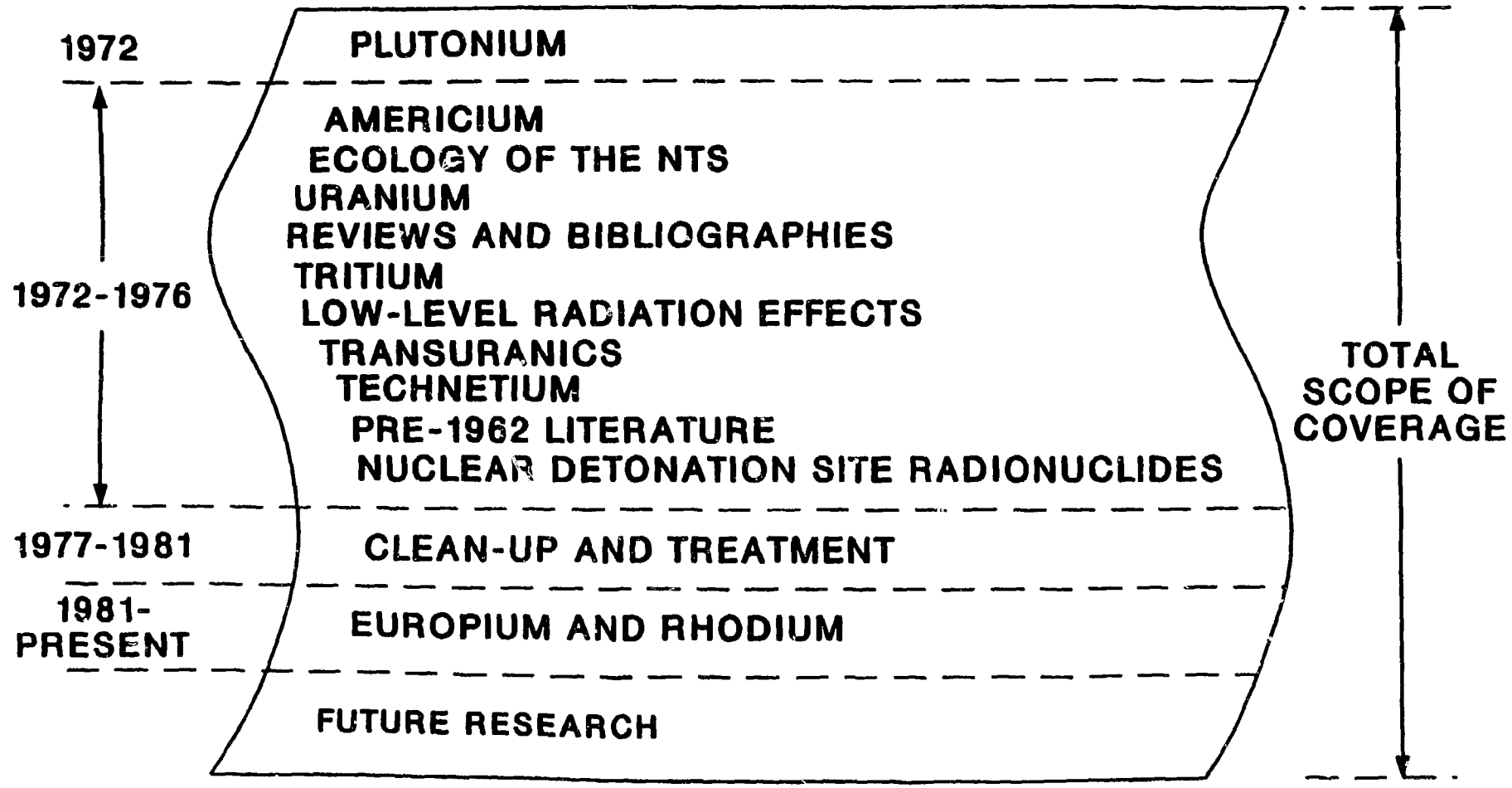

Fig. 1. Expansion of the scope of the NAEWG to accommodate the needs and interests of the '80's.

The database initiated in 1972 to cover the technical literature on the environmental aspects of transuranics has proved to be a useful tool to researchers and decision makers around the world. Some uses for the database have included: (1) responding to requests for specific data, (2) identifying principal investigators involved in specific areas of research, (3) providing resource material for writing reviews, (4) identifying problems in need of research, and (5) providing onsite information support at symposia and workshops. The database and supporting literature collection have also served as a resource for such projects as the International Commission on Radiological Protection (ICRP) studies to set radiation standards for humans and the development of a numeric database on the biomedical aspects of plutonium by staff at the Oak Ridge Comparative Animal Research Laboratory (a Department of Energy-sponsored Laboratory now called the Scarboro Facility). The database was also used to provide literature for a numeric database of worldwide values of plutonium resulting from atomic bomb tests. Nine bibliographies have been derived from this database, the most recent one published in 1978.

The historic literature (pre-1962) project on plutonium and uranium was initiated in fiscal year 1974. The project involved identifying references to classified and unclassified literature dating from 1944 to the 1960s, particularly the reports of the early Plowshare events at the Nevada Test Site. The historic literature was categorized into two major subject areas: (1) exposures to man and animals from radioactivity resulting from nuclear testing and (2) medical and biological aspects of uranium and plutonium. Significant literature on plutonium and uranium at the Trinity Site in New Mexico and at the Nevada Test Site was also collected. This literature encompassed Operation PLUMBBOB and Projects 56, 57, 58, and 58A. These Nevada Test Site nuclear tests were for peaceful uses of nuclear bombs. Information was sought on decontamination efforts near the time of the tests. Many reports summarized data involving meteorology, fallout patterns, and level of activity at selected sites. Several studies were on specific radionuclides; notably, studies of strontium conducted after 1956. Early data on inventories and distribution of radionuclides at the Test Site were particularly difficult to locate.

Project emphasis since fiscal year 1977 has been to collect and analyze data on cleanup and treatment of radioactively contaminated land. An online database of 400 abstracted references was developed on cleanup methods and equipment. This database was also available as a published bibliography, Cleanup and Treatment of Contaminated Land Including Areas Near Nuclear Facilities: A Selected Bibliography, NVO-AEIC-82-1 (1982). The database provides comprehensive coverage since 1972 of domestic and foreign literature pertinent to cleanup of nonradioactive and hazardous sites, with emphasis placed on cleanup efforts at the Nevada Test Site. The literature was categorized into three major areas:

- Cleanup methods relevant to arid climates
  - chemical stabilization
  - physical stabilization

- vegetative stabilization

- Cleanup equipment

- specific types

- manufacturer

- Status of site

- cleanup planned

- cleanup in progress

- cleanup completed

New interest in the bioenvironmental aspects of europium and rhodium evolved in fiscal year 1981. An online database of approximately 500 references was developed for use by NAEG contractors and was published as an annotated bibliography entitled Bioenvironmental Aspects of Europium and Rhodium: A Selected Bibliography, NVO/AEIC-262 (1983). The database contains references to the following subjects as related to europium and rhodium: (1) inventory and distribution studies, (2) soils and vegetation studies, (3) small and large animal studies, (4) statistics and modeling, and (5) general reviews.

The NAEG Publications Database was developed to serve as a guide to the biomedical and environmental studies sponsored by the NAEG. The database highlighted the objectives of the NAEG studies at the Nevada Test Site by summarizing the coordinated NAEG research efforts toward elucidating the effects of plutonium and the transuranics in the environment and the optimal cleanup procedures. The bibliography reflects the research efforts for the NAEG of many scientists, from many disciplines, who worked at a variety of research organizations. It serves as a history of the NAEG and of the progress in studies on environmental aspects of plutonium and other radionuclides. The bibliography, Nevada Applied Ecology Group Publications, NVO-AEIC-78-1 was published in 1978 and was updated in 1983 (NVO/AEIC-264).

The Nevada Applied Ecology Information Center has become widely known for having compiled and analyzed data in the areas of health and environmental aspects of the transuranics. The data have been a key resource for several new projects. For example, a database on the uptake of radioactivity by food crops was compiled in the support of research for ICRP and National Commission on Radiological Protection and Measurements (NCRP). The database summarized results of studies on the presence of naturally occurring radionuclides in food crops grown under field study conditions and encompassed over 3000 examples of 100 different food crops grown in 21 countries and 4 island chains. The data, organized by food name and geographic origin, include radionuclide measured, amount of radioactivity, sampling basis, sampling date, range of values, and number of samples analyzed. The emphasis was on uptake of alpha-emitting radionuclides by food crops.

The Remedial Action and Radioactive Waste Management Programs, sponsored by the Department of Energy, funded extensive information projects at the Oak Ridge National Laboratory based on the resources gained by the NAEIC. There were mutually productive interactions, with each information project drawing on the resources of the others.

Accomplishments

In support of NAEG, the NAEIC accomplished the following:

- Identified and collected historic and current literature relevant to the needs of the NAEG
- Developed five comprehensive, online databases
  - Environmental Aspects of the Transuranics (6000 references)
  - Cleanup and Treatment of Radioactively Contaminated Land (400 references)
  - Bioenvironmental Aspects of Europium and Rhodium (500 references)
  - Nevada Applied Ecology Group Publications (800 references)
  - Uptake of Radioactivity by Food Crops (3000 records)
- Published 13 bibliographies
  - Environmental Aspects of the Transuranics (9 publications)
  - Bioenvironmental Aspects of Europium and Rhodium: A Selected Bibliography
  - Nevada Applied Ecology Group Publications (2 publications)
  - Cleanup and Treatment of Radioactively Contaminated Land, Including Areas Near Nuclear Facilities: A Selected Bibliography
- Provided onsite information support at symposia and workshops
- Responded to numerous (~6000) requests for information

Future Plans

In the future the NAEIC will continue to expand to meet the information needs of the NAEG. Some of the additions and changes in emphasis that we expect are:

- Research the literature (including classified literature) for data on early weapons testing studies, particularly those at the safety shot sites (Area 13, DOMINIC I and II, SEDAN)
- Maintain closer interaction with NAEG researchers and decision makers
- Keep NAEG reseachers aware of new literature through a current awareness digest
- Focus on cleanup and treatment of contaminated land
  - Compile and analyze the cost data on cleanup and treatment of contaminated land
  - Compare the cleanup and treatment methods with the methods used in other nuclear cleanup projects (Three Mile Island, Uranium Mill Tailings Remedial Action Program, and Formerly Utilized Sites Remedial Action Program)
- Provide a summary of the publications of the NAEG

The NAEG will come to a finish in fiscal year 1986. The information support provided to the NAEG for fifteen years by the NAEIC has created a unique and highly valuable resource of collected publications and data in the area of NAEG interest, particularly the bioenvironmental aspects of the transuranics.