



Oak Ridge
Associated Universities
Post Office Box 117
Oak Ridge, Tennessee 37830
Telephone (615) 576-3305

Manpower Education,
Research, and Training
Division

May 4, 1982

Ms. Myu Campbell
Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Dear Myu,

Enclosed are the photographs you requested as well as the newspaper articles we have copies of.

The PIC readings were:

<u>Number</u>	<u>Instantaneous μR/h</u>	<u>Integrated μR/h</u>	<u>Location</u>
1	12.5	12.6	midpoint between 2 & 3 on "road"
2	15	13.0	5, 5 m right
3	12.0	9.2	center goalposts football field
4	136	137	3, 10 m left (in reeds)
5	237	239	11, 10 m left

You may reclaim your blue sweater on your next visit here.

Best Wishes,

Paul W. Frame
Team Leader
Radiological Site Assessment Program

PWF/jm

Enclosures

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 6 a copy requested
FOIA- 2000-0101

ITEM # 419

EISA
REDACTED
(8)

ROBERT A. ROE
8TH DISTRICT, NEW JERSEY

PUBLIC WORKS AND
TRANSPORTATION COMMITTEE
CHAIRMAN - WATER RESOURCES

SUBCOMMITTEES:
ECONOMIC DEVELOPMENT
INVESTIGATIONS AND OVERSIGHT
SCIENCE AND TECHNOLOGY

SUBCOMMITTEES:
ENERGY RESEARCH AND PRODUCTION
ENERGY DEVELOPMENT AND
APPLICATIONS
INVESTIGATIONS AND OVERSIGHT



Congress of the United States
House of Representatives
Washington, D.C. 20515

March 31, 1983

*W.R. Grace
Docket File*

WASHINGTON OFFICE
ROOM 2243
RAYBURN HOUSE OFFICE BUILDING
202-225-5751

DISTRICT OFFICES:
LAW BUILDING
66 HAMILTON STREET
ROOM 102
PATERSON, NEW JERSEY 07650
201-523-5152

U.S. POST OFFICE BLDG.
22 NORTH SUSSEX STREET
DOVER, NEW JERSEY 07801
201-328-7413

158 BOONTON ROAD
WAYNE, NEW JERSEY 07470
201-896-2077

TO: MAYOR'S THORIUM ADVISORY COMMITTEE

As part of this packet of material you will find the following documents:

- *March 24 letter from Rep. Bouquard to Rep. Roe
- *Budget Table and Background Paper from Energy Research and Production Subcommittee of House Science Committee
- *Summary of the final N.J. Department of Environmental Protection report
- *Report of the Center for Disease Control (Atlanta) on the final Nuclear Regulatory Commission report
- *Summary of the Northeast Low-Level Radioactive Waste Compact as per the Low-Level Radioactive Waste Policy Act of 1980 (Public Law 96-573)
- *February 20, 1983, New York Times article describing above compact
- *Report by the W.R. Grace and Company giving their views of the chronology of events from their perspective of the issue

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions b. copyrighted
FOIA- 2000-0101

ITEM # 291

*85
E/M/A
B/290*

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112

ROBERT A. ROE, N.J.
GEORGE E. BROWN, JR., CALIF.
JAMES H. SCHEUER, N.Y.
RICHARD L. OTTINGER, N.Y.
TOM HARKIN, IOWA
MARILYN LLOYD, TENN.
DOUG WALGREN, PA.
DAN GLICKMAN, KANS.
ALBERT GORE, JR., TENN.
ROBERT A. YOUNG, MO.
HAROLD L. VOLKMER, MO.
BILL NELSON, FLA.
STANLEY R. LUNDINE, N.Y.
RALPH M. HALL, TEX.
DAVE MC CURDY, OKLA.
MERYVN M. DYMALLY, CALIF.
PAUL SIMON, ILL.
NORMAN Y. MINETA, CALIF.
RICHARD J. DURBIN, ILL.
MICHAEL A. ANDREWS, TEX.
BUDDY MAC KAY, FLA.
TIM VALENTINE, N.C.
HARRY M. REID, NEV.
ROBERT G. TORRCELLI, N.J.
FREDERICK C. BOUCHER, VA.

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE AND TECHNOLOGY

SUITE 2321 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515
(202) 225-6371

March 24, 1983

LARRY WINN, JR., KANS.
MANUEL LUJAN, JR., N. MEX.
ROBERT S. WALKER, PA.
WILLIAM CARNEY, N.Y.
F. JAMES SENSENBRENNER, WI.
JUDD GREGG, N.H.
RAYMOND J. MC GRATH, N.Y.
JOE SKEEN, N. MEX.
CLAUDINE SCHNEIDER, ILL.
BILL LOWERY, CALIF.
ROO CHANDLER, WASH.
HERBERT H. BATEMAN, VA.
SHERWOOD L. BOEHLERT, N.Y.
ALFRED A. MC CANDLESS, CALI.
TOM LEWIS, FLA.

J. H. POORE
Executive Director
ROBERT C. KETCHAM
General Counsel
DAVID E. JEFFERY
Minority Staff Director

Hon. Robert A. Roe
U.S. House of Representatives
Washington, D.C. 20515

Dear Bob:

I am writing you to provide the details behind the Subcommittee's action with respect to a low-level waste demonstration activity in the mark-up on the Department of Energy's FY 1984 Authorization this week. In response to your concerns, my recommendations which were adopted for add-ons to the DOE FY 1984 request included \$2 million for a demonstration of advanced clean-up technology in the thorium removal activity authorized by the Subcommittee at the Wayne, New Jersey site. As I indicated to you previously, the Subcommittee has significant interest in this program and although we have included the demonstration in the Formally Utilized Sites Remedial Action Program (FUSRAP), I am willing to recommend that it be done separately under the Low-Level Waste R&D program if that would result in a more expeditious initiation of the demonstration at the Wayne site. I shall emphasize my support for this activity in my testimony before the Energy and Water Development Appropriations Subcommittee on April 5. I look forward to working with you on seeing that this demonstration program receives top management attention in the Office of the Assistant Secretary of Nuclear Energy.

Best regards,

Sincerely,

MARILYN LLOYD BOUQUARD
Chairman
Subcommittee on Energy
Research & Production

BACKGROUND PAPER
REMEDIAL ACTIONS
(Shared Jurisdiction)

Formerly Utilized Sites: Add \$2.5 million.

The Department has identified 25 sites that had been used and contaminated by or for the Atomic Energy Commission either as part of the research program or as part of other activities. The Department has authority to clean-up 14 of these sites. The Chairman proposes to add the Wayne, New Jersey site to the list of authorized cleanup sites and proposes to direct the Department to conduct a demonstration of advanced techniques for such cleanup work at that site.

The Chairman also proposes to direct the Department to prepare a cleanup plan for the remaining 10 sites requiring authorization for remedial action. The Chairman believes that this is the most responsible action that this Subcommittee can take on this program.

DESCRIPTION	ACTUAL FY 1982 B/A	ESTIMATED FY 1983 B/A	FY 1984 DOE REQUEST	FY 1984 Chm. Recomm.	REMARKS
Previously Utilized Sites	11,245	11,700	12,000	14,000	+\$2M for demonstration of techniques for decontamination of former AEC contract facilities @ Wayne, NJ
Mid Junction] non R&D related Tailings					
Plus Facilities	11,975	12,933	15,500	15,500	no change
Valley	9,972	15,400	36,000	36,000	Program milestones should be scheduled to produce solidified waste for use in repository-related R&D.
Program Direction	<u>857</u>	<u>857</u>	<u>1,085</u>	<u>1,585</u>	+\$500K for preparation of a plan to clean-up 11 sites contaminated thru AEC-related contracts where government is responsible for clean-up.
(R&D related)	34,049	40,890	64,585	67,085	+\$2.5M



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
JOHN FITCH PLAZA, CN027, TRENTON, N.J. 08625

STEVEN G. KUHRTZ
DIRECTOR

Enclosed is the New Jersey Department of Environmental Protection's report, Radiological Survey of a Former Thorium/Rare Earths Processing Facility (W. R. Grace Property, Wayne, New Jersey). The report contains the DEP's technical findings from the August 1982 survey of the W. R. Grace property and vicinity. This survey is part of a DEP ongoing program to reevaluate former radiation sites to assess their radiological condition.

A comparison of the area's radiological conditions and current property use to the radiological standards for the general public, show that it is unlikely that an individual would be exposed to radiation levels that exceed existing federal and state radiation standards. However, current property use can change which could result in individuals receiving radiation doses above these standards, therefore an evaluation of the surveyed area should be based on more stringent environmental standards.

A comparison of the area's radiological condition to the most conservative environmental standards indicates that future remedial actions are necessary for approximately 15,000 square meters of the W. R. Grace property and 2,000 square meters of the contiguous property to the south. Further, as a result of the extensive soil contamination, the DEP is concerned that the overburden covering the waste disposal areas on the Grace property is insufficient to prevent future movement of contaminated soil by surface run-off.

Although the results of water samples taken in the surface drainage system meet federal and state drinking water standards, they show evidence of contamination. Air samples show radon-222 concentration outdoors and in the office building on the Grace property to be within the background levels for New Jersey, but higher levels were found in the warehouse building.

The DEP will pursue remedial actions for this site with all appropriate parties.

Sincerely,


Steven G. Kuhrtz
Director

E, H

NORTHEAST LOW-LEVEL RADIOACTIVE WASTE COMPACT

SUMMARY FINAL DRAFT

OVERVIEW

Policy representatives of the northeastern states have met over the past year to develop a draft compact for the management of low-level radioactive wastes generated within the region. The draft compact provides a legal framework for a cooperative regional approach to meeting state responsibilities under the Low-Level Radioactive Waste Policy Act (P.L. 96-573), and to ensure the proper, safe and efficient management and disposal of these wastes. The Northeast draft compact is modeled after similar compacts in other regions, modified to reflect unique northeastern needs and concerns. It has been forwarded to each of the eleven northeastern states for their review and consideration.

The PWG has endeavored to draft a document that can remain viable throughout decades and diverse state administrative and legal systems. In its deliberations, the PWG was aware that a compact becomes both a law of each member state and a supra-state contract which creates a legally binding relationship among the party states. A LLW compact must be consistent with the primary federal responsibility for radioactive materials established by the Atomic Energy Act of 1954, as amended.

The PWG consciously chose not to anticipate and resolve every problem which might emerge, nor to specify in detail how each responsibility must be performed under the compact. As a single document which balances the interests of the sovereign states, the federal government, and the region in LLW management, the draft compact is designed as a basic charter of interstate and state-federal relations. It sets forth the principal rights and responsibilities of the signatory parties and provides guidance for future decisions by the states individually and collectively.

The compact has four major provisions.

- It sets forth the major roles, responsibilities and obligations of the party states, the host states (where facilities are located), and the regional commission. Major responsibilities include timely development of a regional facility by a host state, and the commitment of party states and the Commission to a coordinated regional approach to LLW management. An underlying responsibility is the good faith of each state to meet its obligations under the compact.
- The compact establishes the Northeast Interstate Low-Level Radioactive Waste Commission as an advisory and coordinative body to administer the compact. The Commission's role is to ensure that the states' collective interests are considered in the siting, development and management of a regional facility. It has no operational or regulatory authority over a facility. Its regulatory authority is limited to ensuring that member states comply with the compact.

- The compact establishes a process for selecting a state to host a facility. It does not specify how a state would site, develop, and oversee management of a regional facility, thus leaving these tasks to state and federal law.
- The compact sets forth the terms and conditions under which a state joins or withdraws from the compact. Reflecting the contractual basis of such a charter, it provides for penalties and sanctions, including revocation of membership, for states which fail to meet their agreed upon obligations.

SUMMARY OF MAJOR PROVISIONS

Article I. Policy and Purpose

This article recognizes that under federal law, each state is responsible for the disposal of low-level radioactive waste generated within its borders, and declares that in order to promote public health and safety, it is the policy of the party states to enter into a regional compact which will: provide a framework for cooperative efforts; assure proper transportation of low-level wastes; minimize the number of facilities required to manage such wastes; distribute the costs, benefits and obligations of proper waste management equitably among the party states; and ensure the environmental and economic management of low-level waste generated in the region.

Article II. Definitions

Key terms used in the compact are defined in this article.

Article III. Rights and Obligations

This article establishes certain rights and obligations of party states and host states, which are additional to the rights enjoyed by sovereign states. Items addressed under party state rights and obligations include: the right of access to regional facilities; ensuring proper packaging and transportation of waste consistent with applicable federal and state laws and regulations; information and reporting requirements; good faith performance by each state to ensure regional facilities are available; and the capability of each party state to host a regional facility and ensure its proper management.

The rights and responsibilities of each host state include: ensuring timely development, operation and management of a regional facility; providing for reasonable fees and surcharges; ensuring sound packaging, transportation and disposal of waste consistent with applicable federal and state laws and regulations; and regular reporting to the regional Commission.

This article also contains an exclusionary ban on management at a regional facility of wastes generated outside the party states after January 1, 1986. Waste generated in the region cannot be exported to facilities outside the region without approval of the Commission and the affected host states.

Article IV. The Commission

A Northeast Interstate Low-Level Radioactive Waste Commission is created, comprised of one member from each party state and two members from a host state, to be appointed by the Governor according to state procedures. The Commission is empowered to perform a variety of oversight, information-gathering, planning and management functions pertaining to low-level waste disposal within the region, and to designate (by two-thirds vote) a host state for a regional facility if no state volunteers. The Commission rules on applications of eligible and non-party states to become party states and may invoke penalties and sanctions, including revocation of membership, on states which fail to fulfill their obligations. It and the host states determine whether waste can be imported into or exported from the region.

The Commission may mediate disputes among party states, negotiate agreements with other compacts and act as an intervenor on behalf of party states. It must adopt procedural regulations to ensure efficient operation and protection of due process. Meetings of the Commission are to be open to the public. It is separate from the party states and not liable for actions of the party states nor a facility operator. The Commission would be financed initially by a \$70,000 payment from each party state, and subsequently through a special surcharge on users of the regional facility (or facilities).

Article V. Host State Selection and Development and Operation of Regional Facilities

This article establishes basic procedures for selection of a host state and for development of a regional facility. The Commission must develop a regional management plan for determining the type and number of regional facilities. Following a review, the Commission may designate a state volunteering to host a facility.

If no state volunteers, the Commission adopts procedures and criteria for designating a host state, based on statutory selection criteria. These are limited to health, safety, and welfare; environmental economic, and social effects of a regional facility, benefits and costs; waste volumes and types generated in each party state; minimization of waste transportation; and existence of regional facilities in a party state.

A host state is responsible for timely identification of a site and timely development and operation of a facility. It oversees management of the facility, but must solicit comments from party states and the Commission on its management of the facility. A host state must provide notice of any emergency, temporary or scheduled closure of a facility. Fees and surcharges (for host state regulatory programs, post-closure and institutional control funds, compensation and incentives) must be reasonable, equitable and approved by the host state with comment by the Commission.

Article VI. Other Laws and Regulations

The legal parameters of the compact and its relationship to state laws and regulations are defined by this article. Party states are prohibited from passing any law which is inconsistent with the provisions of the compact without jeopardizing their membership status. All existing state laws and regulations of the state or its subdivisions which are inconsistent with the compact are declared null and void, and any provisions which prohibit, suspend or unreasonably delay or restrict the designation, siting or licensing of a regional facility are prohibited and repealed by ratification of the compact. The compact does not abrogate or limit the regulatory authority of the U.S. Nuclear Regulatory Commission or an agreement state under Section 247 of the Atomic Energy Act of 1954, as amended.

Article VII. Eligible Parties, Withdrawal, Revocation, Entry into Force, Termination

States initially eligible to join the compact include Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. The initial eligibility status expires June 30, 1984. Procedures and requirements for an "eligible state" to become a "party state" are set forth in this article, as are procedures for withdrawal and revocation of "party state" status. The compact will take initial effect upon enactment into law by at least three states, but will not take full effect until ratified by Congress. Congress may withdraw its consent every five years.

Article VIII. Penalties

Each state shall prescribe and enforce penalties for violations of the compact in accordance with its own laws. Importation or exportation of waste without Commission approval is prohibited. The states are responsible for enforcing violations of the law, but the Commission may seek enforcement or remedies as provided in the compact.

Article IX. Compensation Provisions

The host state must ensure that funds and procedures are available during the operating and post-closure periods to compensate injured parties and property damage (excluding property diminution) and to provide for clean-up and restoration. The obligation may be imposed on the facility operator, assumed by the state, or both.

The Commission is to provide a means of compensation to persons injured or property damaged during the institutional control period, due to the

radioactive and waste management nature of the regional facility. The fund, based upon a users' surcharge, is also available for third party relief during operational and post-closure periods but only to the extent other resources and means are not available from the host state or other entities. Liability is limited to no more than the amount contained in the fund.

Article X. Severability and Construction

This article contains legal "boiler plate" to assure that if any provision of the compact is invalidated by the courts, the remaining provisions shall remain in full force and effect. Guidance is also given for liberal construction of specific compact provisions.

9/29/80

CHRONOLOGICAL REVIEW OF W. R. GRACE & CO. PLANT
IN WAYNE TOWNSHIP, NEW JERSEY

This document presents a brief chronological review of the W. R. Grace & Co. plant at Wayne Township, New Jersey.

1947 - Rare Earths, Inc. was incorporated in November, 1947 and purchased the 6.4 acre site with buildings from the Farms Hotel, Inc. Permission was granted from the Wayne Township zoning board to process monazite ore at the site and to carry out research activities related to rare earths and thorium materials. (Appendix 1, Pages 1-2).

1948 - April 1, 1948 the Atomic Energy Commission (AEC) issued Source Material License R-132 to Rare Earths, Inc. giving authority to process monazite ore at the site and stipulating record keeping requirements. (Appendix 1, Pages 3-6).

1949 - Equipment was installed and regular processing of monazite ore began, with periodic inspections of plant operations by AEC and New Jersey Department of Environmental Protection (DEP).

1950 - November 2, 1950 contract AT(30-1)1037 between AEC and Rare Earths, Inc. became effective in which the government agreed to purchase thorium fluoride materials. (Appendix 2, Pages 1-19).

1950-1954 - At the request of the Manhattan Engineering District (MED)

and the Atomic Energy Commission (AEC) research was carried out by Rare Earths, Inc. to improve the quality of thorium salts that could be obtained from monazite ore and government-owned thorium sludges. The government was interested in thorium for nuclear activities and considered it to be a strategic material. This work was done to establish possible sources of thorium as well as its characteristics when and if needed by the Federal Government.

1955 - July, 1955 Rare Earths, Inc. entered into federal contract AT(49-6)-993 to process monazite ore from government stockpiles. (Appendix 2, Pages 20-77).

Mid-1955 W. R. Grace & Co. purchased Rare Earths, Inc. for the express purpose of supplying the government with thorium under contract AT (49-6)-993 and possible future contracts.

1956 - November, 1956 Rare Earths, Inc. was dissolved and W. R. Grace & Co. agreed to perform AEC contract AT(49-6)-993. (Appendix 3, Pages 1-2).

1958 - January, 1958 contract AT(49-6)-993 was terminated by mutual agreement. The plant continued to process monazite ore for commercial products. (Appendix 3, Pages 3-4).

With the promulgation of 10CFR 20.304 in 1957 all subsequent thorium burials were in strict compliance with this regulation.

- 1959 - November, 1959 joint inspection of plant carried out by the AEC and the New Jersey Department of Health. A report was issued January 25, 1960 citing several deficiencies, which were corrected. (Appendix 4, Pages 1-15).
- 1961 - June, 1961 a followup inspection of the site was carried out by the AEC. No items of non-compliance were found.
- 1964 - July, 1964 the plant was inspected by the AEC. Two items of non-compliance were cited; these were corrected. (Appendix 4, Pages 16-33).
- 1966 - November, 1966 the plant was inspected by the AEC. No items of non-compliance were found. (Appendix 4, Pages 34-46)
- 1967 - March, 1967 burial of thorium-bearing sludges on the plant site was terminated. Sludges from continuing operation of the plant were transferred to W. R. Grace's facility in Chattanooga, Tennessee.
- July, 1967 certain buildings on the property were leased to Electro-Nucleonics, Inc. (ENI).
- 1970 - April 3, 1970 all processing of monazite ore was terminated.
- May 1, 1970 AEC issued storage license STA-422 under which the Grace plant assumed the status of a storage facility for source materials. This license remained in force until the property was decontaminated and released for unrestricted use in 1975.

1973 - December, 1973 Applied Health Physics, Inc. of Bethel Park, Pennsylvania conducted a radiological survey of the site. Results indicated radioactive contamination of land, buildings and equipment.

Following this survey, Applied Health Physics, Inc. was engaged to decontaminate the buildings and equipment. This included burial of radioactively contaminated demolition materials on-site. Grace assumed responsibility for decontamination of the plant grounds. Mr. Paul B. Klevin, certified health physicist and formerly an inspector in the AEC's Division of Compliance, was employed by Grace to direct the fieldwork.

The purpose of the decontamination work was to achieve radioactivity limits specified by NRC guidelines and the New Jersey state Department of Health in order to obtain a release from the conditions of the AEC license, and approval for unrestricted use of the property. Decontamination was based on achieving an average radioactivity level of 0.2mR/hr (200 micro R/hr) both inside the buildings and on the surface of the site.

Grace received permission from the State of New Jersey to bury mechanical equipment, wooden tanks, etc. that showed unacceptable levels of radioactivity on-site.

1974 - Decontamination was completed in late 1974. Inspections were made while work was in progress by Mr. Eugene Epstein

of the NRC Compliance Section. Mr. Epstein's final inspection was completed September 20, 1974.

A complete report by Applied Health Physics, Inc., dated September 9, 1974, covered the preliminary survey, the decontamination work carried out, and a final survey of the site. This report was submitted to the Materials Licensing Section of the AEC in Washington, D.C. A copy of this report is available for review.

1975 - January 23, 1975 a letter from the NRC to Grace released the property for unrestricted use. (Appendix 5, Pages 1-8).

1976 - Grace commenced annual radiological survey of the property consisting of radioactivity measurements above the surface of the property as well as water samples leaving the property. No off-site measurements were made; at this time no off-site contamination was suspected.

Results showed that the average radiation levels were within the 0.2mR/hr NRC guidelines. Grace considered the survey results acceptable in that they met the guidelines used by the NRC as a basis for releasing the property for unrestricted use. Water samples were also found to be acceptable on the basis of the then-current drinking water standards. (Appendix 6, Pages 1-24).

1977 - May 14, 1977 a fire severely damaged the main building. Grace restored the front one-third of the structure for

office space. Many files relating to Rare Earths, Inc. and W. R. Grace operations were destroyed in this fire.

1979 - October, 1979 all land and improvements were leased to ENI for a four-year term with renewal options. A copy of the lease was filed in the land records of Wayne County.

1981 - On May 25, 1981 an aerial radiological survey of the plant site and Sheffield Brook was conducted by EG & G, Inc. The aerial survey identified the known burial site on the Grace property and an off-site area west of the plant which exhibited higher than normal background radiation levels.

January through November, 1981 NRC conducted ground surveys of the plant site and Sheffield Brook. Results: "Buildings on the site meet current criteria for release for unrestricted use. Some areas around the buildings and off-site may not meet current criteria for release for unrestricted use." A more exhaustive survey was recommended. (Appendix 7, Pages 1-11).

1982 - September, 1982 a second aerial radiological survey was carried out that included a much larger area than the first. The survey confirmed higher than background radiation levels at the plant site, along Sheffield Brook, along the railroad siding in Pompton Plains and in a small area adjacent to the southern boundary of the property.

October, 1982 reports of radiological surveys of Sheffield Brook by the Oak Ridge Associated Universities (ORAU) and the New Jersey Department of Environmental Protection (DEP) were issued. Results of the ORAU survey indicated that "The levels of direct radiation and radionuclide concentrations in soil and sediment at many locations along Sheffield Brook and the associated drainage streams exceed target criteria proposed by the NRC for uncontrolled use by the general public." DEP survey confirmed ORAU findings in general. (Appendix 8, Pages 1-2 & 3-5)

1983 - January, 1983 a report of the on-site radiological survey of the W. R. Grace property by ORAU was issued. Results indicated contamination in the soil and on the surface of the site. Contamination was also found on the property bordering the site on the south and on the railroad siding in Pompton Plains. (Appendix 8, Pages 6-7).

January 28, 1983 Grace meeting with Department of Energy. DOE personnel present included:

Steven R. Miller - Attorney, Office of General Counsel

John E. Baublitz - Director, Division of Remedial Action Projects, Office of Nuclear Energy

Art Whitman & Ed Dulany - Division of Remedial Action Projects, Office of Nuclear Energy

February 9, 1983 Grace meeting with Nuclear Regulatory Commission. NRC personnel present included:

R. G. Page - Chief, Uranium Fuel Licensing
Branch Nuclear Material Safety
and Safeguards

W. R. Crow - Fuel Cycle Licensing,
Asst. to Mr. Page

R. L. Fonner - Counsel

February 17, 1983 Grace letter to Department of Energy
requesting site be included in FUSRAP. (Appendix 9,
Pages 1-4).

March 7, 1983 letter issued from Environmental Resources
Management (ERM) presenting their evaluation of the ORAU
off-site and on-site reports. (Appendix 9, Pages 5-12).

March 15, 1983 Grace meeting with Representative Robert A. Roe
in Washington, D.C.

FEB 16 1983

Docket No. 40-00086

License No. STA-422

Memorandum For: James H. Joyner, Chief,
Nuclear Materials, and Safeguards Branch

From: John D. Kinneman, Chief
Nuclear Materials, Section A

Subject: Sampling of wells at W. R. Grace Site in Wayne, N. J.

Recently Oak Ridge Associated Universities (ORAU) informed us that their sampling of ground water at W. R. Grace property in Wayne, N. J. did not appear to be representative of actual ground water due to heavy rains.

Since the ORAU survey, W. R. Grace and Company has placed six wells at various locations on the property. On January 10, 1983, I spoke to Ron Mace, Industrial Hygienist with the Davison Chemical Division of W. R. Grace and Co. and he described the construction of the wells. A hole was drilled to a depth of at least 15 feet, or until water was reached and then three to five feet deeper. A five foot long well point, or slit polyethelene pipe, was placed at the bottom of the drilled hole, connected to a solid polyethelene pipe reaching several feet above the ground. For the first five to ten feet of the hole, coarse sand was packed around the well point. A minimum of a one foot of impervious clay was placed over that and the remainder of the hole was grouted with concrete. The top of the hole was formed such that rain would drain away from the well. We will sample each of these wells and provide the sample to ORAU for analysis.

Original Signed by:

John D. Kinneman, Chief
Nuclear Materials, Section A

bcc:
Region I Docket Room (with concurrences)


RI:DETP
Kinneman/jpf
2/7/83

OFFICIAL RECORD COPY

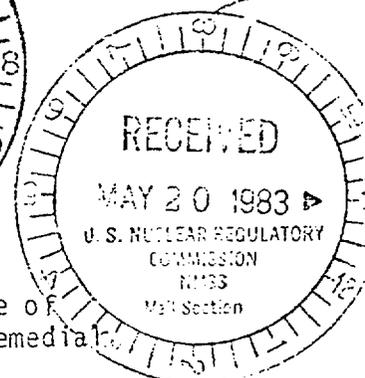
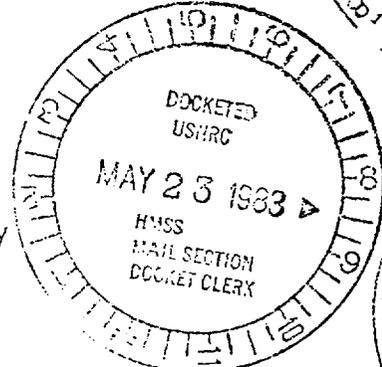
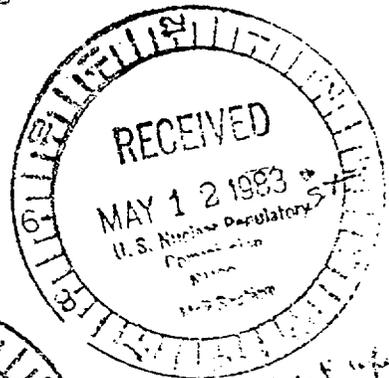
Ryan I

40 36



Department of Energy
Washington, D.C. 20545

APR 11 1983



Mr. R. G. Page, Chief
Uranium Fuel Licensing Branch
Division of Fuel Cycle and Material Safety
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Page:

In response to your March 11, 1983, letter, and reaffirming mine of February 18, 1983, the DOE will not assume responsibility for remedial actions at the Pompton Plains site.

Recent realignment of responsibility within DOE has consolidated our efforts related to identifying and conducting needed remedial action at former MED/AEC sites under the FUSRAP program. In structuring a uniform and consistent approach to determinations of responsibility and authority for FUSRAP, we have concluded that for sites formerly licensed by NRC or its predecessor, the first responsibility for determining current need for remedial action and the means for accomplishing it should remain with the Commission. Thus, as stated in my February 18, 1983, letter, consideration of such sites by DOE would be undertaken only as a result of a determination by NRC that:

1. The conditions at the site constitute a public health and safety risk requiring remedial action, and
2. NRC cannot effect the required remedial action through enforcement actions or other methods.

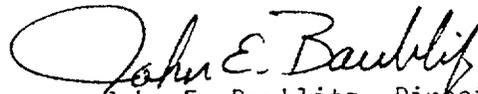
We are currently evaluating our lists of potential FUSRAP sites to identify those we believe to be in the formerly licensed category. This information will be coordinated with your office to establish and maintain a mutually agreed to identification of such sites on a continuing basis.

With regard to the Pompton Plains site, specifically, the DOE involvement described in the enclosures to your letter clearly predates the realignment of responsibility within DOE. In that case DOE did take steps toward an evaluation of the site prior to any determinations on the part of NRC. Dr. Mott's letter of April 21, 1982, indicates that DOE "would have the authority to undertake remedial action to remove radioactive materials resulting from Contract No. AT(49-6)-993 if such action was required to protect public health and safety." However, as mentioned during our

22305
22205

meeting on February 8, 1983, the material produced under that contract accounts for less than 5 percent of the thorium at the Pompton Plains site, and most of the material produced under that contract is actually stored at the W. R. Grace facility at Curtis Bay, Maryland. An evaluation of the overall hazard at the Pompton Plains site (considering all materials present) has indicated that no health and safety hazard exists based on present use. A summary of this evaluation is enclosed for your information. Based on this data, we have concluded that remedial action by DOE cannot be considered required to protect public health and safety for the small amount of material at Pompton Plains resulting from Contract No. AT(49-6)-993. Therefore, DOE plans no further action at the site unless additional legislative authority is provided.

Sincerely,



John E. Baublitz, Director
Division of Remedial Action Projects
Office of Terminal Waste Disposal
and Remedial Action
Office of Nuclear Energy

Enclosure

EVALUATION OF RADIATION EXPOSURES
AT THE FORMER RARE EARTHS, INC. PROCESSING SITE (W.R. GRACE)
WAYNE, NJ

Surveys of the former Rare Earths, Inc., processing site (now the W.R. Grace site), certain offsite areas, and the area along Sheffield Brook identified levels of radioactivity and concentrations of radionuclides on and off the site in excess of normal background levels. Elevated levels were also found on some properties adjacent to or near the former processing site.

The radionuclides present are from the thorium and uranium decay series. These are naturally occurring substances, believed to have been created when the earth was formed, and present today in small quantities throughout our environment. They occur in soil, air, water, food, etc., and are the sources of a portion of the background exposure each person receives daily. Soils in the United States typically have thorium (Th-228 and Th-232) and uranium (U-234 and U-238) levels of 2 pCi/g and 1.2 pCi/g, respectively. Thorium concentrations in igneous rock are typically 2.6 pCi/g. Uranium concentrations in Florida phosphate rock and Tennessee bituminous rock average 80 pCi/g and 30-50 pCi/g respectively. Radiation exposures arising from these radioactive substances in their natural state are not the result of man's activities and, to a large extent, can be controlled only by relocating to regions of lower background levels.

Thorium and its associated decay products (the thorium decay series) are the principal radioactive substances present on the W.R. Grace site and offsite at nearby and adjacent properties and along Sheffield Brook. Thorium concentrations taken from the surface on the site ranged from background to about 8,000 pCi/g, while subsurface samples contained concentrations of thorium as high as 30,500 pCi/g. Soil samples from offsite areas contained thorium concentrations that ranged from background to about 3,800 pCi/g with the highest concentrations being found on adjacent properties. Data from the radiological surveys indicates that the thorium is natural thorium that is both in and out of equilibrium with its decay products in onsite samples. This suggests some of the samples were processed for thorium or certain isotopes were removed during rare earths processing. The samples collected for the Sheffield Brook survey appeared to contain natural thorium in equilibrium with the decay products. Radionuclides in the uranium decay series are present but in lower concentrations than the thorium series. On the site uranium-238 and radium-226 concentrations

Thorium Decay Series

Parent	Half-Life	Major Decay Products	Daughter
Thorium-232	14 billion years	alpha	Radium-228
Radium-228	5.8 years	beta	Actinium-228
Actinium-228	6.13 hours	beta, gamma	Thorium-228
Thorium-228	1.91 years	alpha	Radium-224
Radium-224	3.64 days	alpha	Radon-220
Radon-220	55 seconds	alpha	Polonium-216
Polonium-216	0.15 seconds	alpha	Lead-212
Lead-212	10.6 hour	beta, gamma	Bismuth-212
Bismuth-212	60.6 minutes	alpha (1/3)* beta (2/3)*	Thallium-208 Polonium-212
Thallium-208	3.1 minutes	beta, gamma	Lead-208
Polonium-212	0.0000003 seconds	alpha	Lead-208
Lead-208	stable	none	none

* Two decay modes are possible for Bismuth-212.

Uranium Decay Series

Parent	Half-Life	Major Decay Products	Daughter
Uranium-238	4.5 billion years	alpha	Thorium-234
Thorium-234	24 days	beta, gamma	Protactinium-234
Protactinium-234	1.2 minutes	beta, gamma	Uranium-234
Uranium-234	250,000 years	alpha	Thorium-230
Thorium-230	80,000 years	alpha	Radium-226
Radium-226	1,600 years	alpha	Radon-222
Radon-222	3.8 days	alpha	Polonium-218
Polonium-218	3 minutes	alpha	Lead-214
Lead-214	27 minutes	beta, gamma	Bismuth-214
Bismuth-214	20 minutes	beta, gamma	Polonium-214
Polonium-214	2/10,000 second	alpha	Lead-210
Lead-210	22 years	beta	Bismuth-210
Bismuth-210	5 days	beta	Polonium-210
Polonium-210	140 days	alpha	Lead-206
Lead-206	stable	none	none

ranged from about 0.3% to 35% of the thorium levels, while off the site along Sheffield Brook the uranium series radionuclides were less than 5% of the thorium series concentrations. As with the thorium series, the radionuclides in the uranium chain were also found both in and out of equilibrium depending on the areas from which samples were taken.

Evaluation of the various exposure pathways for thorium have determined that the primary pathway is direct exposure to gamma radiation associated with its decay series. Additional exposure could result from ingestion of contaminated food or water or through inhalation of airborne materials; however, under current use the contributions from these pathways would be small compared to direct exposure.

The National Council on Radiation Protection and Measurements has suggested a maximum recommended annual whole-body dose equivalent of 500 millirem (mrem)* per year to a member of the general population. This dose could result from continuous exposure to 57 microroentgen per hour ($\mu\text{R/hr}$) of gamma radiation or exposure to 250 $\mu\text{R/hr}$ for a normal work year (2000 hours). Gamma radiation measures taken at one meter on the site generally average from background levels to nearly 600 $\mu\text{R/hr}$ with certain small isolated areas measuring as high as 7700 $\mu\text{R/hr}$. The highest gamma levels were found in areas where residues were believed to be buried. Gamma radiation levels off the site averaged less than onsite levels with the maximum being less than 1000 $\mu\text{R/hr}$. Maximum and average measurements along Sheffield Brook were about 270 $\mu\text{R/hr}$ and 49 $\mu\text{R/hr}$ respectively.

To calculate annual radiation dose that might be received by an individual it is first necessary to estimate the amount of time that is spent in areas where elevated radiation levels occur. This is referred to as the "occupancy factor." Under current use conditions the contaminated areas both on and off the site are infrequently used. An occupancy factor of 10% (16.8 hours per week for 52 weeks per year) was selected for the purposes of estimating current use doses. Estimates of doses using the 10% occupancy factor are presented in Table 3.

*A mrem is 1/1000 of a rem and is a measure of radiation dose. An individual receives a radiation dose of 1 mrem as a result of being exposed to 1 milliroentgen (1000 μR) of gamma or x-ray radiation.

Table 3. COMPARISON OF ESTIMATED DOSE RATES (ASSUMING 10% OCCUPANCY) TO BACKGROUND AND THE NCRP STANDARD

LOCATION	ESTIMATED EXPOSURE RATES	ESTIMATED ANNUAL DOSE RATES (MREM/YR)
<u>Onsite</u>		
- Outdoor areas near offices ^a	20-40 μ R/hr	17.5-35 mrem/yr
- Outdoor areas near warehouse ^b	\approx 160 μ R/hr ^d	\approx 140 mrem/yr
<u>Offsite</u>		
- Sheffield Brook area ^a	49 μ R/hr	42 mrem/yr
- School bus maintenance yard ^a	\approx 35 μ R/hr	31 mrem/yr
- Erie Lackawanna railroad area ^a	\approx 42 μ R/hr ^d	37 mrem/yr
External gamma background in New Jersey ^c	\approx 8 μ R/hr	\approx 70 mrem/yr ^c
NCRP Standard	-	500 mrem/yr

^a Estimated assuming the individual spent 16.8 hours per week for 52 weeks in contaminated areas of the site (areas where gamma radiation levels exceed about 20 μ R/hr).

^b Estimated assuming the individual spent 16.8 hours per week for 52 weeks in those areas of the site where gamma levels averaged greater than 60 μ R/hr.

^c Estimated assuming the individual receives the background dose for 100% of his time (8760 hr/yr).

^d Exposure rate for those areas above 20 μ R/hr or 60 μ R/hr as appropriate.

The estimated doses are less than the suggested NCRP standard at all locations evaluated for the 10% occupancy. The annual background dose from exposure to external gamma radiation is exceeded at only the warehouse area on the site. The values in Table 3 can also be compared with a typical chest x-ray (according to data from the Department of Health and Human Services) might yield an exposure of about 27,000 μ R. It should be noted that workers on the W.R. Grace site do not spend much time out of doors, hence, the 10% occupancy factor represents an overestimate of the dose being received by onsite individuals. Doses for the selected offsite locations also represent overestimates of exposure. As a result, the overestimate of occupancy factor and dose will similarly result in an overestimate in health risk from radiation.

The primary health effects associated with radiation exposure is increased risk of cancer. An individual receiving an estimated increased average dose of 140 mrem per year for his lifetime (70 years) would receive a cumulative dose of 9800 mrem. Assuming a lifetime risk factor of 100 fatal cancers per million people receiving 1000 mrem of wholebody radiation dose, the estimated increased risk for 9800 mrem would be 0.98 deaths per 1000 total deaths. Risks resulting from doses less than 140 mrem/year would be proportionally smaller. These risks can be compared to cancer death rates in Passaic County, New Jersey (1977 vital statistics--not age corrected) of 222.3 cancer deaths per 1000 total deaths.

APR 19 1983

Don X. Bancroft, Esquire
69 State Highway No. 23
Rivendale, New Jersey 07457

Dear Mr. Bancroft:

This refers to your letter dated March 1, 1983, concerning the health hazards associated with elevated levels of radionuclide concentrations and any proposed future clean-up operations in the vicinity of the W. R. Grace and Company property in Wayne, New Jersey, and near a railroad track in Pompton Plains, which is a section of Pequannock Township.

The report referenced in your letter, Radiological Survey of the W. R. Grace Property, Wayne, New Jersey, which was prepared by Oak Ridge Associated Universities, does indicate that the contamination identified at both these sites is most likely the result of thorium ore and rare earth processing activities conducted between 1948 and 1971. This report characterizes the direct radiation levels and radionuclide concentrations in soil of the W. R. Grace property and the Pompton Plains site and discusses some criteria used for evaluation of potential health hazards. A review of this report and, in particular, Figures 17 and 18, indicates that there is no immediate health and safety hazard to residents of Pompton Plains as a result of living near or passing through the areas with elevated readings.

As you are probably aware, NRC has been involved in legal reviews and discussions to determine who will be responsible for any needed remedial action at these sites. A variety of technical alternatives may be appropriate for lowering the direct radiation levels, controlling future spread of the contamination, and/or for removing contaminated soil from these sites, if this is determined to be necessary. It does seem clear that since the same entity will have responsibility for deciding on and taking remedial action at both sites and since neither site presents an immediate health and safety hazard, that any remedial action taken would be conducted simultaneously. However, until a final determination is made as to who will be responsible for any future remedial action, and until the extent of such remedial action has been defined, we are unable to more definitively answer your questions.

The NRC staff understands and recognizes the concerns you expressed and we are aware of the concerns and fears of the residents in these areas. We want to assure you that we are working to resolve these issues as soon as possible.

OFFICE ►

SUPNAME ►

DATE ►

RECEIVED APR 20 1983 NRC 004

OFFICIAL RECORD COPY

APR 19 1983

Don X. Bancroft

2

If you have any additional questions or wish to discuss any specific points of the report or of your letter further, you may call John Kinneman at (215) 337-5252. You may call collect.

Sincerely,

~~Original Signature~~

Thomas T. Martin, Director
Division of Engineering and
Technical Programs

OFFICE	RI:DETP	RI:DETP	RI:DETP	RI:DETP			
SURNAMES	Dennis/lp	Kinneman	Joyner	Martin			
DATE	4/8/83	4/8/83	4/8/83	4/11/83			

SUBJECT: LETTER FROM DON X. BANCROFT, ATTORNEY

RE: GRACE PROPERTY, WAYNE, NJ

NUMBER 83-26

PRIORITY

DUE DATE 3/27/83

~~3/27/83~~
5/30/83

per W. Dennis 4/18/83

MARTIN

BORES

EBNETER
(BETTENHAUSEN
ACTING)

BELLAMY

JOYNER

ANDERSON

CROCKER

GLENN

BETTENHAUSEN
(NORRHOLM
ACTING)

PASCIAK

GODY

CAPHTON

SHANBAKY

KINNEMAN

DURR
(NARROW ACTING)

INSTRUCTIONS: JIM: FOR DEVELOPMENT OF RESPONSE FOR MY SIGNATURE. Tim Martin

return this form to Corne

Don X. Bancroft

Attorney at Law

~~EX 6~~ 69 State Highway No. 23
Riverdale, New Jersey 07457

Phone 492-0300

March 1, 1983

Thomas T. Martin
Director - Division of Engineering and Technical Services
U. S. N. R. C.
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Mr. Martin:

Your agency, and more particularly, P. W. Frame, has issued a report entitled Radiological Survey of the W. R. Grace Property, Wayne, New Jersey. A xerox of the cover is attached for identification purposes.

While the report addresses itself to thorium spills, primarily in the vicinity of the W. R. Grace & Co. factory in Wayne, New Jersey, it also includes a site assessment in Pompton Plains (a section of Pequannock Township), wherein there has been discovered elevated levels of radionucleiied concentrations. It is this particular site to which my inquiries are addressed.

A reading of your report would seem to indicate that the Pompton Plains site and the elevated levels seen there are a direct result of the spillage of manozite ore, and the contamination, such as it is, is basically a shallow, surface type.

Conversations with Mr. John Kinneman of your staff and a review of your report would seem to indicate that there is no immediate health hazard posed at the Pompton Plains site.

Secondly, whether there is a long range health hazard is subject to further testing and evaluation.

My concern is not what your report says, but what it doesn't say. While I am fully cognizant that other federal agencies, and possibly state agencies, may have the ultimate jurisdiction to determine the final remedial action, I would

Thamas T. Martin
United States N.R.C.
Page 2

like the N. R. C. to indicate whether or not:

1. There is an immediate health hazard at the Pompton Plains site.
2. If there is a health hazard, immediate or otherwise, is the Pompton Plains site and the contamination found thereon, one which is amenable to simple soil removal?
3. Is it possible to segregate the Pompton Plains site from the Wayne site from the standpoint of remedial action?
I ask this because it appears that the Pompton Plains site appears to be one of minor contamination susceptible to easy clean up as opposed to the Wayne site, where the contamination is more extensive, demanding more exotic remedial action.
4. Would it be possible to remove the Pompton Plains contamination to an alternative and less critical area of the Township, pending a final determination as to what to do with the contaminated soil and who is going to pay for it?

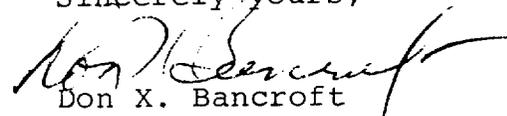
These questions and the thrust of same are prompted, not by anything other than a layman's concern that the minimal problem in Pompton Plains, when coupled with the more serious problem in Wayne, might well serve to do a disservice to the Township itself, from the standpoint of public confidence in the environmental integrity of the area.

If, indeed, I am correct, and the Pompton Plains site is one of minimum spillage and minimal danger of health hazard, susceptible to simplistic remedial action, would it not be in the town's best interest, as well as that of the N.R.C., to label same just that, and thus, intradict the exacerbation of public concern, caused by a more serious situation in Wayne.

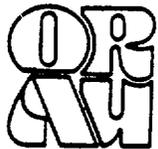
I ask these questions, and solicit your answers, knowing full well the N.R.C.'s responsibilities and the sensitivity of the situation.

Thank you for your courtesies.

Sincerely yours,


Don X. Bancroft

DXB:pb
cc: Mr. Carmine DiGiaino



Prepared by
Oak Ridge Associated
Universities

Prepared for
Division of Fuel
Cycle and
Material Safety

U.S. Nuclear
Regulatory
Commission

RADIOLOGICAL SURVEY

OF THE

W. R. GRACE PROPERTY

WAYNE, NEW JERSEY

P. W. FRAME

Radiological Site Assessment Program
Manpower Education, Research, and Training Division

FINAL REPORT

January 1983

Docket No. 40-00086

SEP 23 1983

License No. STA-422

W. R. Grace and Company
ATTN: Thomas O. Tung
Consultant
Davison Chemical Division
P.O. Box 2117
Baltimore, Maryland 21203

Gentlemen:

This refers to your letter dated May 25, 1983. I apologize for the long delay in responding to your letter, but I have been attempting to find a copy of the document you requested. Unfortunately, I have been unsuccessful. However, enclosed are copies of the "Guidelines" dated December 1973, and a copy of the current "Guidelines" dated July 1982. I believe that the "Guidelines" dated December 1973, are not substantially different from those dated April 22, 1970. I will continue to search for a copy of this document and if I find one I will immediately forward it to you.

I would point out to you that none of these "Guidelines" contain limits for the decontamination of soil. These limits are primarily contained in the Branch Technical Position published in the October 23, 1981, edition of the Federal Register (46 FR 52061). The addition of the soil contamination limits is the primary difference between NRC policies followed for the decontamination of sites and facilities in 1970-1979 and the present policies.

I hope that this information is of assistance to you.

Sincerely,

Original Signed By:
John D. Kinneman

John D. Kinneman, Chief
Nuclear Materials Section A

cc:
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)

bcc:
Region I Docket Room (w/concurrences)
W. Crow, NMSS

Enclosures:

1. "Guidelines" dtd. 12/73
2. "Guidelines" dtd. 7/82

DET
Kinneman/lp
9/2783

IE:07

353KINNEMAN8/29/83 - 0006.0.0
09/01/83

December, 1973

U. S. Atomic Energy Commission
Directorate of Licensing
Materials Branch
Washington, D. C. 20545

GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT
PRIOR TO RELEASE FOR UNRESTRICTED USE
OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE, OR SPECIAL NUCLEAR MATERIAL

The instructions in this guide in conjunction with Tables I and II specify the radioactivity and radiation exposure rate limits which should be used in accomplishing the decontamination and survey of surfaces of premises and equipment prior to abandonment or release for unrestricted use. The limits in Tables I and II do not apply to premises, equipment, or scrap containing induced radioactivity for which the radiological considerations pertinent to their use may be different. The release of such facilities or items from regulatory control will be considered on a case-by-case basis.

1. The licensee shall make a reasonable effort to eliminate residual contamination.
2. Radioactivity on equipment or surfaces shall not be covered by paint, plating, or other covering material unless contamination levels, as determined by a survey and documented, are below the limits specified in Tables I or II prior to applying the covering. A reasonable effort must be made to minimize the contamination prior to use of any covering.
3. The radioactivity on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.
4. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated with materials in excess of the limits specified. This may include, but would not be limited to, special circumstances such as razing of buildings, transfer of premises to another organization continuing work with radioactive materials, or conversion of facilities to a long-term storage or standby status. Such requests must:
 - a. Provide detailed, specific information describing the premises, equipment or scrap, radioactive contaminants, and the nature, extent, and degree of residual surface contamination.
 - b. Provide a detailed health and safety analysis which reflects that the residual amounts of materials on surface areas, together with other considerations such as prospective use of the premises, equipment or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

(1) SURFACE CONTAMINATION LEVELS

REMOVABLE (3) (4)

10,000 dpm α/100 cm ²	1,000 dpm α/100 cm ²	1,000 dpm β-γ/100 cm ²
AVERAGE 5,000 dpm α/100 cm ²	25,000 dpm α/100 cm ²	AVERAGE 0.2 mrad/hr at 1 cm
MAXIMUM 1,000 dpm α/100 cm ²	500 dpm α/100 cm ²	MAXIMUM 1.0 mrad/hr at 1 cm

TOTAL (3) ISOTOPE (2)

U-238, U-235, U-238, Th-232, and associated decay products
 Other isotopes which decay by alpha emission or by spontaneous fission
 Beta-gamma emitters (150-0.4 mrad/hr at 1 cm (5))
 Beta-gamma emitters (150-0.4 mrad/hr at 1 cm (5))
 other than alpha emitters
 other than alpha emitters
 or spontaneous fission

TABLE I

TOTAL (3) REMOVABLE (3) (4)

10,000 dpm α/100 cm ²	100 dpm α/100 cm ²	1,000 dpm β-γ/100 cm ²
AVERAGE 5,000 dpm α/100 cm ²	500 dpm α/100 cm ²	AVERAGE 0.2 mrad/hr at 1 cm
MAXIMUM 1,000 dpm α/100 cm ²	500 dpm α/100 cm ²	MAXIMUM 1.0 mrad/hr at 1 cm

TABLE II

(1) Either Table I or Table II may be used. For example, if all beta-gamma readings were less than 0.4 mrad/hr at 1 cm, Table I could be used; but if the maximum reading were 0.8 mrad/hr, material could be released under Table II providing the average was less than 0.2 mrad/hr.

(2) These surface contamination limits by both alpha and beta-gamma emitting isotopes exist, the limits established for alpha and beta-gamma emitting isotopes shall apply independently.

(3) As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector and count rate meter for background, efficiency, and geometric factors associated with the instrumentation.

(4) The amount of removable radioactive material per 100 cm² of surface area shall be determined by wiping that area with dry filter or soft absorbent paper and with the application of moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. In determining removable contamination on objects of lesser surface area, the pertinent levels shall be reduced proportionally, and the entire surface shall be wiped.

(5) Measured through not more than 7 milligrams per square centimeter of total absorbent.

(6) Measurements of total contamination shall not be averaged over more than 10 square meters. For objects of lesser surface area, the average shall be derived for each such object.

5. Prior to release of premises for unrestricted use, the licensee shall make a comprehensive radiation survey which establishes that contamination is within the limits specified in Tables I or II. A copy of the survey report shall be filed with the Director, Materials Branch, Directorate of Licensing, USANL, Washington, D.C. 20545, and also the Director of the Regional Office of the Directorate of Regulatory Operations, USAEC, having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report shall:

- a. Identify the premises.
- b. Show that reasonable effort has been made to eliminate residual contamination.
- c. Describe the scope of the survey and general procedures followed.
- d. State the findings of the survey in units specified in the instruction.

Following review of the report, the AEC will consider visiting the facilities to confirm the survey.

GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT
PRIOR TO RELEASE FOR UNRESTRICTED USE
OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE,
OR SPECIAL NUCLEAR MATERIAL

U. S. Nuclear Regulatory Commission
Division of Fuel Cycle and Material Safety
Washington, D.C. 20555

July 1982

The instructions in this guide, in conjunction with Table 1, specify the radionuclides and radiation exposure rate limits which should be used in decontamination and survey of surfaces or premises and equipment prior to abandonment or release for unrestricted use. The limits in Table 1 do not apply to premises, equipment, or scrap containing induced radioactivity for which the radiological considerations pertinent to their use may be different. The release of such facilities or items from regulatory control is considered on a case-by-case basis.

1. The licensee shall make a reasonable effort to eliminate residual contamination.
2. Radioactivity on equipment or surfaces shall not be covered by paint, plating, or other covering material unless contamination levels, as determined by a survey and documented, are below the limits specified in Table 1 prior to the application of the covering. A reasonable effort must be made to minimize the contamination prior to use of any covering.
3. The radioactivity on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.
4. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated with materials in excess of the limits specified. This may include, but would not be limited to, special circumstances such as razing of buildings, transfer of premises to another organization continuing work with radioactive materials, or conversion of facilities to a long-term storage or standby status. Such requests must:
 - a. Provide detailed, specific information describing the premises, equipment or scrap, radioactive contaminants, and the nature, extent, and degree of residual surface contamination.
 - b. Provide a detailed health and safety analysis which reflects that the residual amounts of materials on surface areas, together with other considerations such as prospective use of the premises, equipment or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

5. Prior to release of premises for unrestricted use, the licensee shall make a comprehensive radiation survey which establishes that contamination is within the limits specified in Table 1. A copy of the survey report shall be filed with the Division of Fuel Cycle and Material Safety, USNRC, Washington, D.C. 20555, and also the Administrator of the NRC Regional Office having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report shall:
 - a. Identify the premises.
 - b. Show that reasonable effort has been made to eliminate residual contamination.
 - c. Describe the scope of the survey and general procedures followed.
 - d. State the findings of the survey in units specified in the instruction.

Following review of the report, the NRC will consider visiting the facilities to confirm the survey.

TABLE 1
ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDES ^a	AVERAGE ^{b c f}	MAXIMUM ^{b d f}	REMOVABLE ^{b e f}
U-nat, U-235, U-238, and associated decay products	5,000 dpm α /100 cm ²	15,000 dpm α /100 cm ²	1,000 dpm α /100 cm ²
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm ²	300 dpm/100 cm ²	20 dpm/100 cm ²
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm ²	3000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm $\beta\gamma$ /100 cm ²	15,000 dpm $\beta\gamma$ /100 cm ²	1000 dpm $\beta\gamma$ /100 cm ²

^aWhere surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

^bAs used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

^cMeasurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

^dThe maximum contamination level applies to an area of not more than 100 cm².

^eThe amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

^fThe average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

FEB 7 1983

Docket No. 40-00086

License No. STA-422

Township of Wayne
ATTN: Arthur R. Bartolozzi
Health Officer
475 Valley Road
Wayne, New Jersey 07470

Gentlemen:

This refers to your letters of September 30, 1982, November 15, 1982 and your note dated December 6, 1982. In your September 30 letter you requested that the Nuclear Regulatory Commission investigate the Sheffield Brook thorium problem more thoroughly by investigating the potential contamination of the aquifer, performing additional tests in the actual burial pits on the W. R. Grace site, and immediately advising of the results of core samples. These same issues were addressed in Resolution 235 of the Wayne Township Council and were discussed in our letter to Congressman Roe dated September 29, 1982. A copy of this letter is enclosed for your information.

In this letter you also requested that we supply you with our findings regarding the additional flyovers as soon as possible. The aerial survey which was conducted over Wayne Township during September, 1982 was contracted for and paid for by the United States Department of Energy (DOE). Therefore, I suggest that you contact the U. S. Department of Energy in Germantown, Maryland regarding the results of this aerial radiological survey.

In your letter dated November 15, 1982, you requested that we address the question of removal of the radioactive material from the W. R. Grace and Company property and the Sheffield Brook area. To date, no information or survey results have changed our initial determination that there is no immediate threat to the health and safety of the residents of Wayne from the presence of this material. Decisions concerning specific actions to be taken will be made by the agency with responsibility for final disposition of the site. The Department of Energy will not make a final decision concerning their involvement in the site until they have reviewed the final report of the Oak Ridge Associated Universities surveys on the W. R. Grace property. We do not expect any recommendations until after that time. Due to the press of other work, the large number of samples to be analyzed, and the need for careful review of the data, this report has been delayed until now. However, a copy is enclosed.

I understand the desire for a prompt solution to this problem; however, we believe it is important to take sufficient time to develop good data on which to base sound decisions.

Thank you for the material you provided with your note dated December 6, 1982.

JE:c7

Township of Wayne

2

FEB 7 1983

If I can be of any additional assistance, please do not hesitate to contact me.

Sincerely,

Original Signed By:

John D. Kinneman, Chief
Nuclear Materials Section A
Nuclear Materials and Safeguards
Branch

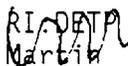
Enclosures: As Stated

cc w/encl:
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
State of New Jersey

bcc w/encl:
Region I Docket Room (with concurrences)
J. Suermann, OCA
W. Crow, NMSS


RI:DETP
Kinneman/wb
1/31/83


RI:DETP
Joyner
2/3/83


RI:DETP
Martin

township of wayne

ARTHUR R. BARTOLOZZI, R.S., M.A.
HEALTH OFFICER
DIRECTOR OF HEALTH & WELFARE

475 Valley Road
Wayne, New Jersey 07470
(201) 694-1800
Police Department
(201) 694-0600

November 15, 1982

John D. Kinneman, Chief
Nuclear Materials Section A
U.S. Nuclear Regulatory Commission
Region 1
631 Park Avenue
King of Prussia, Pennsylvania 19406

Subject: Radiological Surveys of Sheffield Brook, Final Report

Dear Mr. Kinneman,

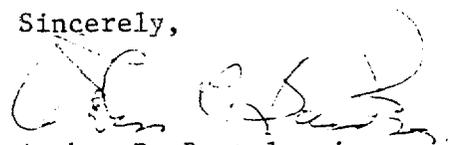
This is to acknowledge receipt of your report with reference to the above subject matter.

The report is comprehensive. However, it does not specify what, if any, recommendations you are making regarding the disposition of this material.

The Wayne Township administration would like you to address the question of removal of the radioactive material from the W. R. Grace site and the Sheffield Brook area.

I would appreciate your early response to these questions.

Sincerely,



Arthur R. Bartolozzi
Health Officer

ARB:kms

cc: Congressman Robert Roe
8th District, New Jersey

Dr. Marvin Resnikoff, Consultant
P.O. Box 92, Blairstown, N.J.

John Leidy, Business Administrator
Township of Wayne

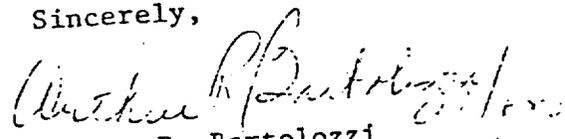
December 6, 1982

John D. Kinneman, Chief
Materials Program Section No. 1
U.S. Nuclear Regulatory Commission
Region 1
631 Park Avenue
King of Prussia, PA 19406

Dear Mr. Kinneman,

For your information, enclosed please find report
submitted by Dr. M. Resnikoff, Consultant, regarding
the surveys of Sheffield Brook by the NRC and the
DEP.

Sincerely,


Arthur R. Bartolozzi
Health Officer

November 30, 1982

MEMO

TO: Mayor W. Jasinski, Town Council, A. Bartolozzi

FROM: M. Resnikoff, consultant on thorium contamination

RE: Radiological Surveys of Sheffield Brook by the Nuclear Regulatory Commission and the New Jersey Department of Environmental Protection

In this memo, the Nuclear Regulatory Commission (NRC) and New Jersey Department of Environmental Protection (DEP) reports on radiological surveys of Sheffield Brook are critically reviewed and recommendations offered to the Town Council for its consideration.

On October, 1982, both the NRC and DEP released reports of radiological surveys of Sheffield Brook taken Spring, 1982. This followed aerial surveys taken May, 1981 by EG & G, and preliminary ground measurements taken by the NRC November, 1981. One report is due December, 1982, an NRC radiological survey of the Grace & Co. property.

The final NRC report, virtually identical to the preliminary report released July, 1982 and confirmed by the DEP report, shows that Sheffield Brook is contaminated with radioactive materials, thorium and its decay products. This contamination extends the length of Sheffield Brook, about 700 meters (from the Grace property at Black Oak Ridge Road, to the Pompton River), up to 70 meters in width and one meter in depth. The levels of contamination are above the EPA interim cleanup standards and also above NRC guidelines. According to the NRC, approximately 13,000 cubic meters of contaminated earth would have to be removed to reduce radiation levels to NRC guidelines. Despite the request of the Town of Wayne, neither the NRC nor DEP offer recommendations on what to do with this contamination which presently exceeds legal limits. Neither the federal agencies (NRC and DOE) nor Grace & Co. have assumed responsibility for the cleanup, nor proffered a plan with fixed goals and timelines. If the federal agencies perform the cleanup, Congress would have to appropriate the money, presumably according to an NRC or DOE recommended plan. The Mayor, Committee of the Town Council, or Town Attorney, should enter into informal negotiations with the federal agencies and the office of Representative Roe on a cleanup plan.

Water Contamination Levels

People are primarily affected by radioactivity from Sheffield Brook/Grace property in two ways: by direct exposure near the site and through ingestion of contaminated water. While the reports show that radioactive concentrations in water are below drinking water standards (the most restrictive standard), the levels downstream of the Grace property are much higher than up stream levels indicating that radioactivity is leaching from the site and the soil by Sheffield Brook.

DEP sampling shows gross alpha radioactivity upstream of the Grace property (W1) as 0.68 pCi/l, and leaving the Grace property (entering the sewer lines, W13) as 5.67 pCi/l. See Figure 1 for the location of sampling locat-

ions. It therefore appears that the radioactivity concentrations increase due to surface drainage from the Grace site.

The surface drainage then enters an underground sewer line upon leaving the Grace property. Two sewer lines feed into the Grace property drainage and dilute the radioactivity levels. In moving further downstream, the radioactivity levels in Sheffield Brook again increase. This information is summarized in Table 1 below, the DEP measuring points being shown in Figure 1.

The NRC measurements are, in general, higher than those of DEP. For example, the radioactivity concentrations of the drainage ditch leaving the Grace & Co. property are 5.67 pCi/l (W13, DEP) versus 29 pCi/l (#8, NRC). The reason for this discrepancy is not clear since the methods are virtually identical. The NRC report did not list radioactivity measurements upstream of the Grace & Co property. Perhaps the December NRC report will have this information.

In sum, while the radiation levels in water are below EPA standards, measurements by DEP show unmistakable leaching of radioactivity, primarily radium-228 which is more soluble. This leaching is from both the Grace property and from property downstream. The NRC measurements show radioactivity concentrations at the drainage ditch leaving the Grace property above the EPA drinking water standards.

Direct Radiation Exposure Levels

The radioactivity released from the Grace property via Sheffield Brook over the years has washed over an extended area, and has been dredged onto the stream banks. This radioactivity emanates from thorium-232 and its decay products, some of which emit gamma radioactivity, causing whole body radiation exposures. The levels near Pompton Plains Cross Road range from 6 to 10 μ R/h (background levels) up to 420 μ R/h near Sheffield Brook, or about 40 times background. The band of land about Sheffield Brook with these higher than background levels is about 50 meters in width.

West of Farmingdale Road the radiation levels are lower and the band of land with greater than background radioactivity has a width 10 to 20 meters.

Do these levels exceed radiation standards? A range of standards, along with different methods of interpretation, exist. According to the NRC, no individual member of the general public is to receive more than 500 millirems per year (mr/y) (57 μ R/h, assuming continual occupation). For an operating nuclear fuel cycle facility, the fencepost dose limit is 25 millirems per year. The guideline for a nuclear reactor is 5 mr/y. For inactive uranium mill tailings sites, a situation most closely resembling Wayne, the external exposure rate limit is equivalent to 10 μ R/h. According to DEP, this latter value is exceeded in an area greater than 18,000 m² surface area along Sheffield Brook, from the Grace property to the Pompton River.

Soil Measurements

The levels of radioactivity in soil (in units of picocuries per gram, pCi/g) vary from background up to 722 pCi/g. Baseline soil measurements in

the Wayne area vary from 0.58 pCi/g to 1.6 pCi/g. Clearly, the levels near Sheffield Brook exceed this natural radioactivity by a wide margin. The general surface area of higher than natural background thorium-228 closely parallels the area where higher radiation exposures occur.

The EPA standards for remedial action are 5 pCi/g for radium-226. The NRC criteria, set in 1981, is 5 pCi/g for thorium-232 for unrestricted use, which corresponds to a direct exposure rate of 10 μ R/h above background. The levels along Sheffield Brook greatly exceed these levels. DEP estimates that a surface area of 18,000 m² would not meet these criteria. The NRC estimates that about 13,000 cubic meters of soil would have to be removed to reach a concentration limit of 10 pCi/g.

NRC Hazard Evaluation Faulty

While the NRC has declined to state whether or not Sheffield Brook should be decontaminated, its views on the hazard level and its understanding, are clearly stated in Appendix E. To determine the hazard, the NRC estimates the length of time a person would be exposed to radiation at Sheffield Brook, the exposure per year received, and the increased cancer risk incurred. One could disagree over details such as the amount of radiation exposure and the risk of low level ionizing radiation, but before entering into such a discussion, it is important to recognize that the NRC has changed the rules of the game at Wayne. At reactors or fuel cycle facilities, one customarily calculates a fence post dose to a hypothetical individual who spends 24 hours per day in residence. This dose must be less than 5 mr/y for a reactor and 25 mr/y for a fuel cycle facility. At Wayne such calculations would yield a dose up to 3700 mr/y from direct exposure alone, much higher than the limit of 500 mr/y. The NRC therefore takes a 10% occupancy factor, reducing the highest level to 370 mr/y, below the 500 mr/y limit. Second, the definition of the term "unrestricted release" has also been altered to fit the circumstances at Wayne. Customarily, when the NRC releases a site for "unrestricted" use, this implies that neither the former licensee nor the NRC would need to monitor and inspect the site. The Grace property and Sheffield Brook are in this category - no licenses are being held. While the NRC assumes an "occupancy factor" of 10%, they have no way of ensuring compliance. Property can be sold and uses will change over the long time periods that this radioactive material will remain toxic. Any future landowner or child can use the site as he or she wishes.

The NRC also compares the Wayne site to Florida (phosphate rock, 80 pCi/g) and Tennessee (bituminous rock, 30-50 pCi/g). These are natural rock formations that are not the result of human activities. However, in Wayne, monazite sands were imported from overseas and other outside areas, and processed at Wayne. The residues left at Wayne are the result of human activities in transporting and processing these sands.

It is important to recognize that a radioactive dump was created at Wayne without proper findings being made by the AEC. No analysis was performed by AEC Staff to evaluate the suitability of the Grace property for final disposal of thorium residues. No effective control was exercised by the AEC in preventing the Sheffield Brook area from becoming contaminated. The NRC has a conflict of interest in judging, in retrospect, whether proper findings were originally made and whether the site is hazardous.

Table 1. Radioactivity Concentrations in Water Samples

<u>Sample No.</u>	<u>Location Description</u>	<u>Gross Alpha (pCi/l)</u>	<u>Comments</u>
W ₁	Sheffield Brook upstream of Grace property	0.68	
W ₁₃	Sheffield Brook leaving Grace Property	5.67	radioactivity concentrations increase in passing over Grace property
W ₂	Sheffield Brook at Pompton Plains Cross Road	1.69	radioactivity concentrations diluted by two additional sewer lines
W ₃	Sheffield Brook, 50 meters north of Farmingdale Road	2.10	
W ₄	Confluence of Sheffield Brook and Pompton River	9.22	radioactivity concentrations continue to increase in passing over contaminated soil

Data from DEP radiological survey

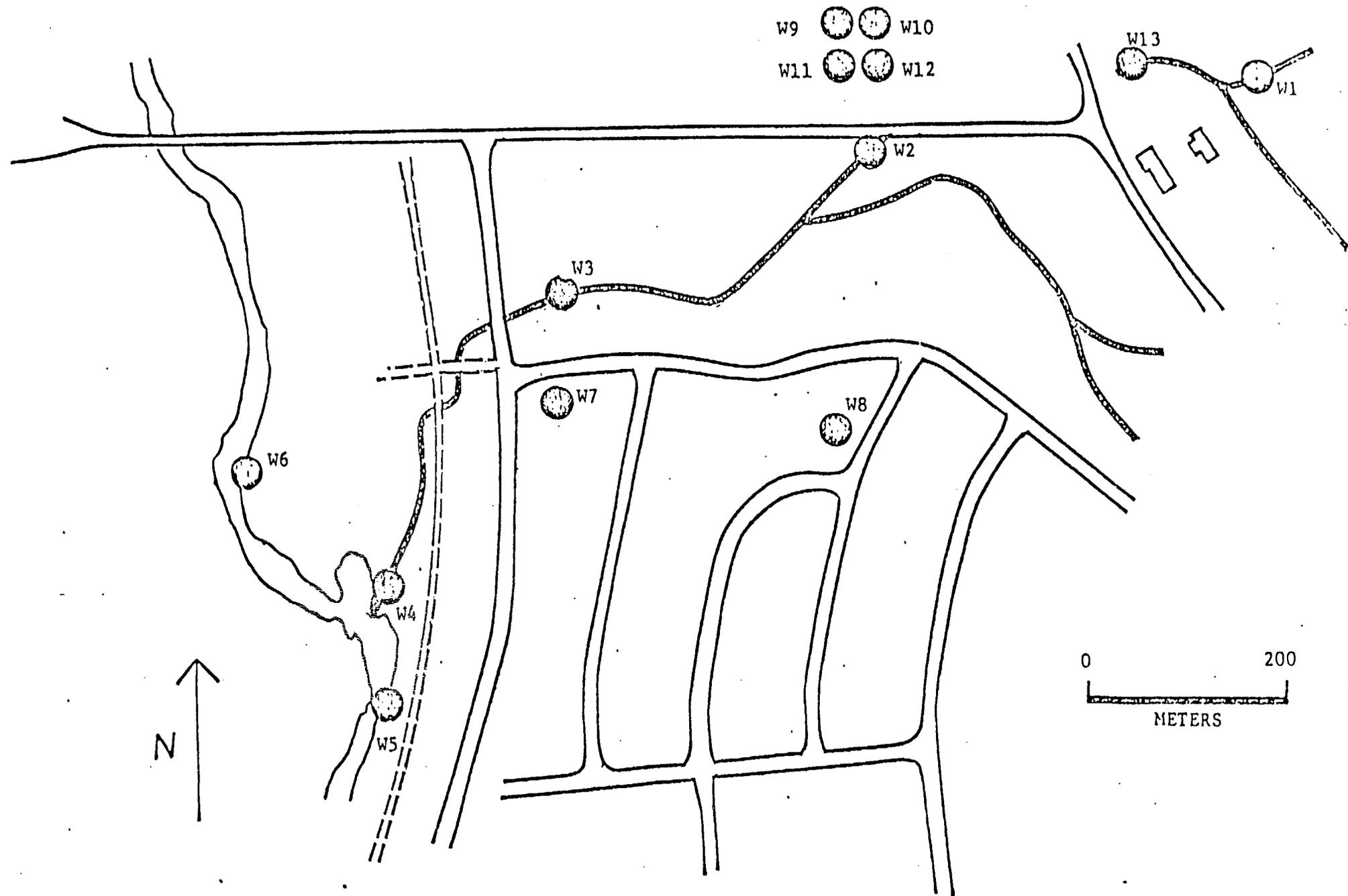


FIGURE 1: WATER SAMPLING LOCATIONS

From DEP radiological survey



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SEP 29 1982

The Honorable Robert A. Roe
United States House of Representatives
Washington, D.C. 20515

Dear Congressman Roe:

I am pleased to address the issues identified in the letter dated August 25, 1982, from Marvin Resnikoff and in Resolution No. 235 of the Wayne Township Council, which were enclosed with your letter of September 14, 1982. The letter and the Resolution concerned the W. R. Grace and Company property and surrounding area in Wayne, New Jersey.

From previous discussions between you and members of the NRC staff and from our previous correspondence, including my letters to you dated May 21 and September 1, 1982, you are familiar with the background of the Wayne situation. In addition, our Office of Congressional Affairs provided you with a copy of a Preliminary Report, Radiological Survey of Sheffield Brook, Wayne, New Jersey, dated July 1982, which was prepared by our contractor, Oak Ridge Associated Universities (ORAU).

Detailed responses to the specific issues in Dr. Resnikoff's letter and in the Resolution are contained, respectively, in Enclosures 1 and 2 to this letter.

We realize that these issues are of significant concern to you and your constituents, and are working to resolve them. We will keep you informed of our progress.

Sincerely,

A handwritten signature in black ink, appearing to read "William J. Dircks".

William J. Dircks
Executive Director
for Operations

Enclosures:

1. Response to Dr. Resnikoff's letter
2. Response to Resolution No. 235

ENCLOSURE 1

Response to Dr. Resnikoff's letter

Items are numbered as in Dr. Resnikoff's letter dated August 25, 1982.

Item 1: "According to NRC's 'Proposed Radiological Survey Plan,' March 15, 1982, the final report on the stream survey was due in August. The preliminary report was completed on schedule in July. What is the holdup in the final report? Additional core drilling near Sheffield Brook was done in August. What was the purpose of these additional drillings?"

Response: The issuance of the final report has been delayed by the need of Oak Ridge Associated Universities to respond to NRC staff comments on the preliminary report and consider additional data which was not available at the time the preliminary report was published. The final report is scheduled to be available in October. The additional core drillings were conducted to provide additional and more complete information on conditions near the Brook. The results of these drillings will be incorporated in the final report.

Item 2: "The preliminary report has no recommendations. Though the Town Council and I will come to conclusions, and make recommendations, I think it would be useful to have the NRC do likewise, both for off- and on-site."

Response: The reports of the NRC contractor (Oak Ridge Associated Universities), who performed the radiological surveys around the Sheffield Brook and on the W. R. Grace site, are intended only to provide results of the survey measurements and observations of the survey group. Recommendations are the responsibility of the agency or party responsible for disposition of the site. Since the Department of Energy (DOE) has agreed to consider this site for the Formerly Utilized Site Remedial Action Program, this is likely to be the DOE staff. The NRC has previously concluded that there is no immediate hazard to the residents of Wayne from the presence of this thorium contamination. No data obtained from the contractor to date has changed this conclusion.

Item 3: "Finally, the site has an aquifer which may be passing through the burial pits. The on-site core drilling should include an investigation of the underground soil structure by a geologist, particularly a hydrogeologist. The NRC will be taking water samples from the drill-holes, where available."

Response: Drinking water samples taken from homes in this area have all been well within U.S. EPA standards for radioactivity. The results of the surveys on the W. R. Grace property will provide data to determine whether the site is affecting any water supplies. Such investigations will be the responsibility of the agency or party with ultimate responsibility for the site.

Item 4: "One of the Concerned Citizens asked how it would be possible to know the full extent of the buried materials on-site without core drilling into the burial pits. Grace & Company has objected to such drillings for fear the clay liner under the burial pits should be pierced. The NRC has instead carried out radar measurements of the pits and core drilling around the pits. Much of this awaits the NRC report, but unless the pits contain drums, it is also unclear to me how the full extent of buried materials will be known."

Response: Until the ORAU report is complete, it will not be known whether the core drilling and radar survey will provide sufficient information concerning the buried waste. They will certainly provide an important basis for planning additional work, should such work be necessary.

ENCLOSURE 2

Response to Resolution No. 235 of The Wayne Township Council

Items are lettered as in Resolution No. 235

Item a: "The hiring by the Nuclear Regulatory Commission of a Hydro geologist."

Response: The Nuclear Regulatory Commission has access to qualified hydro geologists both on staff and as consultants. We assume that the Resolution intends to suggest that a hydrogeologist review the situation in Wayne. Such a review will be the responsibility of the agency or party with responsibility for disposition of this site.

Item b: "That the contemplated flyover be performed over the entire Township."

Response: EG&G, under contract to the Department of Energy, began an additional aerial radiological survey over Wayne Township on September 16, 1982. EG&G has informed us that this survey will include essentially all of Wayne Township.

Item c: "That the material being dredged from the Pompton and Passaic River systems, as well as soil systems, be properly tested for radioactive material."

Response: The NRC Region I office has made arrangements to test samples of the dredged material for thorium.

Item d: "That the Nuclear Regulatory Commission perform additional tests on the W. R. Grace site in the actual burial pits."

Response: The recent surveys by ORAU include a large number of onsite measurements, including sampling from a number of boreholes near the burial pits. Additional testing is not planned until the analysis of these samples is complete and the results of all measurements are reported. A determination regarding additional testing will be made at that time.

Item e: "That the Nuclear Regulatory Commission immediately advise the Township and the affected residents of the results of the core samples taken from said residents' backyards."

Response: The NRC has made available to Township officials the preliminary report of the radiological survey of Sheffield Brook, Wayne, New Jersey dated July 1982. This report contains the preliminary results of the core samples. The final report of the survey at Sheffield Brook is expected to be available during October 1982 and a copy will be furnished to the Township officials and to the residents.

Item f: "That the Nuclear Regulatory Commission furnish the Township with final reports and recommendations for all the tested sites without further delay."

Response: The surveys and sample analysis being conducted by ORAU under contract to the Nuclear Regulatory Commission are both time consuming and complex. Due to the concerns of the people in Wayne, the NRC has expended considerable effort to produce the final reports as quickly as possible. A final report of the surveys of Sheffield Brook is scheduled to be available in October 1982. A preliminary copy of the final report of the surveys on the W. R. Grace property is expected to be available during December 1982.

W. R. GRACE

JAN 18 1983

MEMORANDUM FOR: Ralph G. Page, Chief, Uranium Fuel Licensing Branch, NMSS

FROM: James H. Joyner, Chief, Nuclear Materials and Safeguards Branch,
Region I

SUBJECT: DRAFT RADIOLOGICAL SURVEY OF THE W. R. GRACE and CO. PROPERTY,
WAYNE, NEW JERSEY

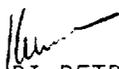
We have reviewed the subject draft report; our detailed comments are contained in the enclosure. We are impressed with the amount and apparent quality of the data presented. Our two major comments, which are elaborated in the details, are that more complete presentations of the surface and one meter exposure data are necessary and that clearer conclusions about the actual conditions of the site are necessary. We believe guidelines or criteria should not be discussed in the report. Since we expect that many nontechnical individuals will read this report we have asked for more detailed explanations and clarifications than we normally would in a technical report.

With regard to paragraph numbers in the enclosure, the first full paragraph on the page is numbered 1.

If we can be of any additional assistance, please let us know.

Original Signed By:

James H. Joyner, Chief, Technical
Programs Branch, Division of
Engineering and Technical Programs


RI:DETP
Kinneman/hh
1/18/83


RI:DETP
Joyner
1/18/83

OFFICIAL RECORD COPY

Enclosure
REGION I COMMENTS ON THE DRAFT RADIOLOGICAL SURVEY
AT THE W.R. GRACE AND CO. PROPERTY

1. page 3, para. 2 - The offsite storm sewer system should be described. A diagram like Figure 9 in the Radiological Survey of Sheffield Brook, Wayne, New Jersey, should be included.
2. page 3, para. 3 - Delete "also" from second sentence.
3. page 4, para. 2 - Was the property south of the W. R. Grace site once part of the Grace property? If it was, this should be made explicit.
4. page 6 - Since this report will be read by many nontechnical persons, the difference between "exposure" and "dose" should be defined or deleted. (See Comment 10). As presently written, the report is confusing.
5. page 6, para. 3 - We do not believe that an Eberline HP-260 probe has a "shielded" configuration. Please explain how shielded measurements were made.
6. page 7, para. 2 - This should be rewritten to make clear that the entire area between the concentration of higher radiation levels and the isolated points of higher radiation levels to the south on the railroad was surveyed and no elevated reading found.
7. page 9, para. 3 - Were vegetation samples washed?
8. page 10, para. 2 - Aren't the baseline values for surface beta-gamma dose rates a little high? A reference should be provided and the results compared to published values.
9. page 11, para. 2 - The distinction between "systematic" measurements and the "surface scan" is subtle here and in other places. It should be made explicit or the distinction dropped.
10. page 11, para. 3 - It should always be explicitly stated whether surface or 1 m data is being discussed. We believe the fact that the dose rates are higher than the exposure rates may be a result of the measurement technique. If there is some significance attached to this difference it should be explained; if not, it should be deleted. Suggested rewrite of paragraph:

"Individual surface dose rate data are not presented in this report; the pattern of these dose rates is in good agreement with the pattern of the exposure rates described above. Unshielded HP-260 probe measurements ranged from 25 to 40 percent higher than measurements performed with the probe face shielded, indicating a significant dose contribution from beta and low-energy photon radiations. This is consistent with the thorium contamination found."

11. page 13, para. 1 - Last sentence should read, "These differences suggest that the materials encountered represent residues from different processes and stages in operations conducted at the site."
12. page 13, para. 2 - Last sentence is in conflict with last sentence on page D-2.
13. page 13, para. 3 - We do not understand the significance of the observation in the last sentence on page. It should be explained or dropped.
14. page 14, para. 1 - It appears that numbers with a "<" are MDA's here and throughout report. If this is so, then "MDA" should be explained. We suggest, "where results are reported as less than Minimum Detectable Activity (<MDA), this means that the radionuclide was not present to the best of our ability to measure it." Also it should be explained why MDA's for the same nuclide vary throughout report.
15. page 14, para. 3 - A more complete explanation should be provided of why the borehole water samples are not representative of ground water.
16. page 14, para. 3 - Last sentence conflicts with page 20, para. 2 and page 21, para. 4.
17. page 14, para. 4 - We believe the statement, "The disequilibrium ... is unexplained" is inappropriate. Since vegetation is the subject, this could easily be preferential uptake. Also, the word "significant" is ambiguous. Does it mean there were some isotopes detected above MDA or not? Also, why were Ra-228 values directly measured for these samples and not for other samples?
18. page 15, para. 1 - Does "Maximum exposure rates" refer to surface or 1 m? If to surface, why are 1 m rates not discussed? "Direct radiation levels" is unclear; does it mean surface exposure, dose rate, or exposure at 1 m? The type of floor (concrete, board) should be specified.
19. page 15, para. 3 - Drop "The" and begin final sentence "Two samples ..."
20. page 16, para 1 - Previous discussions began with rates at 1 m. To avoid confusion, this one should also.
21. page 17, Discussion - All of the material on guidelines, etc. should be deleted. The purpose of this report is to describe the site objectively. The discussion should summarize the observations concerning the site and provide statements of conclusions about how things are at the site. Questions which might be answered include, Are observed conditions consistent with described uses of the site? How has this site changed in the last few years? How is it likely to change in the future?

A suggested rewrite is:

"This survey identified thorium contamination in soil on the W. R. Grace site, the adjacent property south of the site, and a section of the Erie Lackawanna Railroad in neighboring Pompton Plains. Elevated radiation levels are associated with the thorium contamination, as expected. The contamination on the adjacent property south of the site and the Erie Lackawanna Railroad appears to consist of unprocessed thorium ore and is mainly concentrated near the surface. The contamination on the W. R. Grace site is consistent with the reported processing of large quantities of thorium bearing ores and the burial of wastes and residues from this processing on the site.

W. R. Grace Site

"Contamination on the W. R. Grace and Company site apparently originated from on-site storage and shallow land burial of ores, wastes, residues and contaminated equipment from previous operations. The ground radar study and the relatively high thorium surface contamination levels in some locations suggest that wastes were not always buried in well defined trenches and that buried wastes may have been disturbed and spread over the eastern portion of the property."

"Analysis of samples taken from boreholes and measurements at suspected burial locations indicated higher thorium concentrations in the subsurface soil than in the surface soil. Thorium concentrations in surface soil samples collected east and north of the drainage stream (well away from the burial areas) and along the western property boundary were slightly elevated. Thorium concentrations in surface and subsurface soil collected near the south property boundary were also elevated."

"Due to the extensive disturbance of soil on the property, the lack of agreement between site personnel and the ground-penetrating radar results concerning the burial locations, and because of intentional avoidance of drilling into suspected burial trenches, it was not possible to estimate the total volume and activity of wastes on the site." (Continue with para. 3 on page 19).

22. page 19, para. 3 - The statement, "This includes the warehouse building, which is occupied during normal working hours" needs to be expanded. The statement apparently refers to the warehouse on the W. R. Grace site, but no presentation of the radiation levels in this warehouse is contained in the report. Diagrams similar to Figure 15 should be provided for surface and 1 m exposure rates.
23. page 19, final para. - The discussion of migration is very confusing. It should define what is migrating and whether migration is still occurring or not.

These statements should be made before possible pathways are discussed. Also, evidence for migration (e.g., the observations of survey team) should be presented. A diagram of site contours and/or surface drainage routes would be helpful here.

24. page 20, para. 1 - See item 16.
25. page 20, para 4 - Does "Direct Radiation Levels", refer to 1 m or surface?
26. page 21 - Suggested rewrite:

Summary

"At the request of the Nuclear Regulatory Commission, the ORAU Radiological Site Assessment Program conducted a radiological survey of the W. R. Grace and Co. site in Wayne, New Jersey, properties adjacent to the W. R. Grace and Co. site and a section of the Erie Lackawanna Railroad in neighboring Pompton Plains. The survey found extensive thorium contamination in soil and elevated radiation levels on portions of the W. R. Grace and Co. site. Radionuclide concentrations in the sediment and water collected from the on-site storm sewer system indicate ... " [a proper conclusion of what is occurring presently should be used to complete sentence.]

- page 21 - Continue with same 3rd and 4th paras., but add the word "elevated" before "thorium concentrations" and delete "direct" and "which exceed the NRC guidelines" from the first sentence of para. 3.
27. page 25, Figure 5 - The words "burial ground" or "burial" are used frequently in the report; it would be helpful if the area referred to was shown or outlined (in color?) on this figure. Revise caption: "1-8 = Circular holes filled April - June 1974 with debris and contaminated equipment resulting from decontamination of buildings."
 28. page 9, Figure 9 - Is there a difference between the open and closed circles?
 29. page 33, Figure 13 - General Comments on this figure and Figures 14, 15, 16, and 17. It is confusing to have one figure map out exposure rates at 1 m for one area while a similar figure for another area provides surface exposure rates. We recommend that both surface and 1 m exposure rates be mapped for the site, the warehouse on the adjacent property and the railroad property. The exposure rates at the boundary between the site and the south property are not well shown in the present Figures.
 30. All Tables - Same comment as previously regarding "MDA".
 31. page 40, Table 2 and all tables presenting Th-232 results - The first column is headed Th-232 (Ra-228). It appears that Th-232 was assumed to be equal to Ac-228, which was actually measured. However, the heading implies Ra-228 was measured, but it appears Ra-228 was only measured for water samples and some vegetation samples. This could be cleared up by a note or additional explanation on page D-2.

32. page 49, Table 6 - Why no water sample from D-14? What does "O" in D-10 mean? Footnote "c" reference is missing.
33. page 52, 53, 54, Tables 9, 10, 11 - Footnote order is reversed from previous tables.

Ground Penetrating Radar Report.

34. page 18, - Units, "Si/meter", have not been defined.
35. page 21 - It is not clear why use of 300 MHz was precluded.
36. The mixture of "feet" and "meters" throughout report is confusing.
37. page 26 - The statement, "Particularly interesting (misspelled in report) is one which crosses the south lawn and parking area and enters the burial ground from the west", should be explained.
38. page 26, para. 2 - What conclusions did they draw?
39. page 27, Figure 10 is very difficult to read.
40. page 28, Does, "With few exceptions, most of the subsurface objects were detected at an apparent depth of less than 4 feet" mean that no burial is deeper than four feet? We doubt this is true, so it should be explained. The last sentence is an example of the type of clear conclusion which will make the report more useful.
41. page D-1 - Why is a conversion factor (incomplete in the report) listed for beta-gamma and no other - we suggest that this be made uniform.
42. page D-2 - Last sentence conflicts with other parts of report.
43. page D-4 - Were vegetation samples washed?

TOWNSHIP OF WAYNE
COUNTY OF PASSAIC
STATE OF NEW JERSEY
1983
RESOLUTION NO. 162

A motion was made by Gary Webb seconded by Robert Pacca that the following resolution be adopted:

REGARDING THE REMOVAL OF ON-SITE AND OFF-SITE CONTAMINATED MATERIAL AT THE W. R. GRACE SITE

BE IT RESOLVED by the Municipal Council of the Township of Wayne as follows:

WHEREAS, the Township Council has reviewed the reports of the Center for Disease Control and the other reports forwarded by Congressman Roe on or about June 24, 1983:

NOW, THEREFORE, BE IT RESOLVED by the Municipal Council of the Township of Wayne as follows:

1. The Council wishes to thank Congressman Roe enthusiastically and appreciatively for his continuing efforts to bring about the removal of on-site and off-site thorium from Wayne Township and from Pequannock Township.
2. Copies of this Resolution shall be sent to Congressman Roe, the U. S. Center for Disease Control, the Nuclear Regulatory Commission, the U. S. Department of Energy, the State Department of Environmental Protection and our State Legislators.

ROLL CALL:

AYES: Joyce Amabile, Frederick Bauer, Joseph Di Donato, William Hanse, Robert Pacca, Bert Tucker, Gary Webb

NAYS: None

ABSENT: David Waks, Joseph Loffredo

THIS IS TO CERTIFY THAT THE FOREGOING IS A TRUE AND EXACT COPY OF A RESOLUTION ADOPTED BY THE MUNICIPAL COUNCIL OF THE TOWNSHIP OF WAYNE AT A REGULAR MEETING HELD ON JULY 6, 1983.


JOHN R. O'BRIEN
CLERK

township of wayne

475 Valley Road
Wayne, New Jersey 07470
(201) 694-1800
Police Department
(201) 694-0600

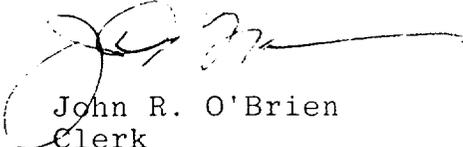
July 8, 1983

Nuclear Regulatory Commission
Washington, D. C.
20555

Gentlemen:

Enclosed is a certified copy of Resolution No. 162 of 1983
adopted by the Municipal Council of the Township of Wayne
at a regular meeting held on July 6, 1983.

Very truly yours,


John R. O'Brien
Clerk

JRO/dlm
enc.

MAY 27 1980

Docket No. 40-0086

License No. STA-422

Weichert Realtors
ATTN: Bernice Linderberg
1110 Hamburg Turnpike
Wayne, NJ 07470

Dear Ms. Linderberg:

Enclosed is a copy of "Radiological Survey of Sheffield Brook, Wayne, New Jersey", as you requested.

If you have any questions concerning this report do not hesitate to call me.

Sincerely,

Original Signed by:

John D. Kinneman, Chief
Nuclear Materials and Safeguards
Branch, Section A

Enclosure:
As Stated

bcc:
Region I Docket Room (w/concurrence)

OFFICE ▶	RI:DETP						
SURNAME ▶	Kinneman/sk1						
DATE ▶	5/20/83						

FEB 10 1983

Docket No. 040-00066

License No. STA-422

EX. 6



Dear Mr. Perkel:

SUBJECT: RADIOLOGICAL SURVEYS OF W.R. GRACE AND COMPANY PROPERTY, WAYNE, NEW JERSEY

Enclosed for your information is a copy of the subject report.

If you have any questions concerning this report, you may call me at (215) 337-5252.

Sincerely,

Original Signed By:

John D. Kinneman, Chief
Nuclear Materials Section A

Enclosure:
As stated

bcc: Region I Docket Room (w/concurrences)

OFFICE	RI:DETP						
URNAME	Kinneman						
DATE	2/5/83						

Docket No. 040-90086

FEB 10 1983

License No. STA-422

EX-6 [Redacted]

Dear Ms. Van Dyken:

SUBJECT: RADIOLOGICAL SURVEYS OF W.R. GRACE AND COMPANY PROPERTY, WAYNE, NEW JERSEY

Enclosed for your information is a copy of the subject report.

If you have any questions concerning this report, you may call me at (215) 337-5252.

Sincerely,

Original Signed By:

John D. Kinneman, Chief
Nuclear Materials Section A

Enclosure:
As stated

bcc:
Region I Docket Room (w/concurrences)

OFFICE	RI-DETP						
SURNAME	Kinneman						
DATE	2/10/83						

40-110

MAY 27 1983

EX-6 [Redacted]

Dear Mr. Kamdar:

Enclosed is a copy of "Radiological Survey of Sheffield Brook, Wayne, New Jersey", as you requested.

If you have any questions concerning this report do not hesitate to call me.

Sincerely,

Original Signature

John D. Kinneman, Chief
Nuclear Materials and Safeguards
Branch, Section A

Enclosure:
As Stated

bcc:
Region I Docket Room (w/concurrence)

OFFICE	RI:DETP						
SURNAME	Kinneman/sk						
DATE	5/23/83						

FEB 22 1983

Docket No. 040-00086

License No. STA-422

EXC [Redacted]

Dear Mr. Van Abs:

SUBJECT: RADIOLOGICAL SURVEYS OF W.R. GRACE AND COMPANY PROPERTY, WAYNE, NEW JERSEY

Enclosed for your information is a copy of the subject report.

If you have any questions concerning this report, you may call me at (215) 337-5252.

Sincerely,

Original Signed By:

John D. Kinneman, Chief
Nuclear Materials Section A

Enclosure:
As stated

OFFICE	BI:DETP						
SURNAME	Kinneman						
DATE	2/22/83						

February 9, 1983

MEMO

TO: Mayor W. Jasinski, Town Council, A. Bartolozzi

FROM: M. Resnikoff, consultant on thorium contamination

RE: NRC Radiological Survey of the W.R. Grace Property, Wayne, NJ,
January 1983

SUMMARY

This memo reviews the NRC radiological survey of the W.R. Grace property released February 1, 1983. The survey is the most complete available of the radioactive contamination on the Grace and Co property. The survey consisted of a ground penetrating radar scan, measurement of exposure levels at the surface and 1 meter above the surface, and collection of surface and subsurface soil samples and sediment, water and vegetation samples. In order to measure radioactivity levels in subsurface water, monitors were placed in six boreholes; these results will be released in an addendum to the radiological survey. Also, within three weeks, NJ DEP will be issuing an independent radiological survey of the Grace & Co property. These reports should shed further light on aspects of the extent of contamination, but the results of the NRC survey are serious enough to begin the discussion.

Based on the NRC data, the site is an extremely poor one for radioactive waste disposal, one of the worst I have reviewed. Borehole drillings show that the ground water depth is only three feet to six feet below the surface, indicating the wastes sit in water continuously. The presence of an artesian aquifer indicates that underground water moves through the site with a head from the hill behind the site. Because of the rains in July, the NRC decided that water samples in boreholes were unreliable and did not release the results. The ground penetrating radar was not able to detect the burial pit locations, as Concerned Citizens and I had suspected before these tests were performed. As a result, the NRC was unable to determine the location, volume and activity of the wastes on the Grace site.

Soil samples were taken from the borehole. High borehole readings were encountered in unexpected locations indicating underground migration of radioactivity or a faulty survey by Grace & Co when the site was released for unrestricted use January 1975. The surface radioactivity levels, ranging up to 610 R/h far exceed the permissible levels for unrestricted release. In isolated locations, the surface radioactivity levels are as high as 7.7 mr/h which greatly exceeds previous survey results by Grace & Co. Soil samples of thorium in boreholes show levels as high as 30,500 pCi/g, considerably above the EPA cleanup standards of 5 pCi/g.

Since it will be almost impossible to prevent water migration onto the site due to the steep hill to the east, the radioactive material ought to be removed from the site. Temporarily it can be stored in above ground bunkers also designed for transport. The wastes from Sheffield Brook should also be placed in such bunkers on the site. DOE should prepare a decommissioning plan for the site and the Sheffield Brook area. Under DOE's FUSRAP program

and also under Section 151(c) of the Nuclear Waste Policy Act of 1982, DOE is authorized to take possession of the Grace & Co site and wastes. Section 151(c) requires adequate financial arrangements for decommissioning to be approved by the Commission.

SOIL SAMPLES

Surface soil samples were collected at the intersections of 20 m grid lines and also at locations of elevated gamma radiation levels. The systematic survey showed thorium (Th-228 and Th-232) concentration levels ranging between 2.14 pCi/g and 721 pCi/g. The biased samples showed surface radioactivity levels ranging up to 7540 pCi/g. These levels are to be contrasted with EPA interim cleanup standards of 5 pCi/g above background. These higher surface radioactivity levels indicate that not all the thorium wastes were buried under 4' of cover, as required by the NRC regulations.

Borehole soil samples were collected from 43 boreholes in July 1982. Twenty of these boreholes were only 1 m deep, while 23 boreholes were drilled to ground water depth. However water rapidly filled most boreholes within 1m to 2 m of ground surface. The water was attributed to heavy July rains. It rained 2 inches in July 1982, less than the average monthly rainfall. Thus the two inch rainfall is not unusual. Because of the site topography and geology, there is surface and underground water flow on the Grace & Co site. The hill to the east of the property provides head for the artesian well on the premises.

because of the surface water flow, the NRC could not reliably measure underground flow and no readings were recorded. Six monitors have been placed in boreholes and the NRC will release an addendum to the radiological survey shortly. DEP also did not take measurements from the boreholes. Because a geologist or hydrogeologist was not employed by the NRC to review core samples as the Town in a resolution had requested, basic information regarding soil structure and the identification of permeable strata for water flow may have been lost unless the cores were retained.

Soil samples were taken from the boreholes and these provided very useful information. Some borehole readings, presumably taken in the burial pits themselves, ranged as high as 30,500 pCi/g. Several high readings occurred at 1 m or less from the surface (B15, B16, B20, B22, B26, B27, B30, B32). See attached Fig.10 for borehole locations and Figure 6 for suspected burial locations. This is contrary to the regulations which required a ground cover of 4' or greater. Surprisingly, a Grace & Co official stated that a minimum of 6' of earth-fill covered each earth pit. This remark, stated in 1964, was clearly a false statement. In several cases, high underground readings were taken far from suspected burial locations indicating that previous locations were not properly reported, another violation of the regulations, or that radioactivity is migrating underground. For example, no waste was buried near borehole 21, yet the radioactivity levels increase with depth indicating underground migration. The borehole readings on the southern border (B28, B30, B31, B34) were also not buried near suspected locations indicating underground migration off-site, a very unsettling situation. At 10' below ground, the levels in B28 begin to increase; at 15' below ground, the levels in B31 begin to increase.

Borehole 30 seems to have been drilled into the pit area which should have been 30' away. The NRC agrees. "The relatively high thorium surface contamination levels in some locations and the findings of the ground-penetrating radar survey suggest that the burials were not necessarily at well defined locations and that buried wastes may have been disturbed and eventually spread over the eastern portion of the property." On the western border, boreholes 42 and 43 were drilled near Black Oak Ridge Road. The soil sample radioactivity levels in these holes are approximately 5 pCi/g and therefore within EPA standards. However, the radioactivity levels decrease and then increase with depth indicating possible underground migration. Water samplers placed in these boreholes will provide a more definitive answer at a later time.

A few soil samples contained high ratios of radium-226 and uranium-238 compared to thorium levels. This is also consistent with occasional high radium-226 to thorium levels found in isolated locations near Sheffield Brook indicating that a small amount of uranium ore may have been processed at Grace & Co. The records show that the company did possess small amounts of such ore and the company was allowed to process it. The hazards of radium-226 and radium-228 and decay products are comparable. The presence of Ra-226 should not unduly concern the Council.

RADAR SURVEY

The ground penetrating radar survey was unable to locate the burial pits specified by the Grace & Co records (see Fig.6). Because it failed to give definitive information, the radar survey was relegated to Appendix C of the NRC report which concludes that "the soil on the W.R. Grace property had been subjected to extensive disturbances". It is not clear if top soil was brought in when the site was graded and seeded, but it does appear that some burial pit wastes were distributed during the burial or grading operations. Providing appropriate records to document burial locations is a requirement of NRC regulations, clearly violated by Grace & Co. Without knowing the precise locations of the burial pits, it is difficult to know at an early stage whether radioactivity is migrating. Monitors at the fence boundary yield information about off-site migration, but by the time such migration is detected, remedial action would necessitate the removal of large quantities of contaminated earth.

DIRECT RADIATION LEVELS

Direct exposure rates, at a 1 m height, varied from 13 to 540 R/h. This is to be contrasted with background levels of 6 to 10 R/h. These levels are high for an unlicensed facility. In my opinion, the ENI plant should be relocated to another site in Wayne. A worker at ENI would receive a yearly dose greater than 1 rem per year based on levels of 540 R/h for a 40 hour work week. This is equivalent to the dose received by the average nuclear power plant worker. The primary difference here is that the Grace property is unlicensed and out of NRC control and that these doses will continue essentially forever, as long as humans enter upon the premises. Levels throughout the site are greater than 60 R/h. If a person were continually present, this would yield a dose of 500 mr/y, the maximum limit. The interim EPA cleanup standards are much less, 10 R/h.

Many small areas of the site have much higher surface contact readings, up to 7.7 mr/h. These are radiation levels at a 1 cm height and include radiation. Boreholes were drilled in these areas of higher readings and are generally associated with burial pit locations.

Surface radiation exposure levels outside of and to the south of the W.R. Grace property, at the school bus maintenance yard, are much higher than background. These high off-site levels are attributable to two causes. The north building was used for the storage of monazite sands and was not decontaminated by WR Grace. This accounts for high readings in well-defined spots in the building. High readings near the property line may be attributable to either blowing material during past processing operations or to surface water migration. The levels, up to 890 R/h, diminish with distance from the fence and will also require decontamination.

CONCLUSIONS, RECOMMENDATIONS

The NRC survey report for the Grace & Co property clearly shows that the site is a poor one for radioactive waste disposal. The topography and abundant rainfall leads to a large amount of water on the Grace site. This has led to surface migration of radioactivity. According to the NRC, sediment samples show a "pattern of increasing concentrations was observed as the (sewer) system neared the outfall from the W.R. Grace property." The storm sewers have elevated levels. Further, the NRC states that surface run-off "continues to be a significant mode of migration." The NRC borehole readings were taken in July, when only two inches of rain had fallen, yet the boreholes were filled within 3' to 6' of the surface. Because water samples were not taken from the boreholes, it was not possible to determine the extent of underground migration. Soil samples taken in the boreholes suggest migration near Black Oak Ridge Road and to the south of the property.

After the survey, the NRC could not "estimate with reasonable accuracy the total volume and activity of the on-site wastes." Reluctant as I am to suggest further testing, the NRC needs to define more precisely the locations of the burial pit areas in order to cost effectively move the wastes from the site. Without defining where the pits are located, removal of wastes would need to encompass the whole site. The heavy concentrations of radioactivity in the burial pit areas should be placed in above ground bunkers that can also be used for transportation at a later time when a final disposal site is selected for this type of toxic material. The radioactivity along Sheffield Brook should also be placed in bunkers on-site. Shielding will be needed at the fence to protect neighbors against direct radiation.

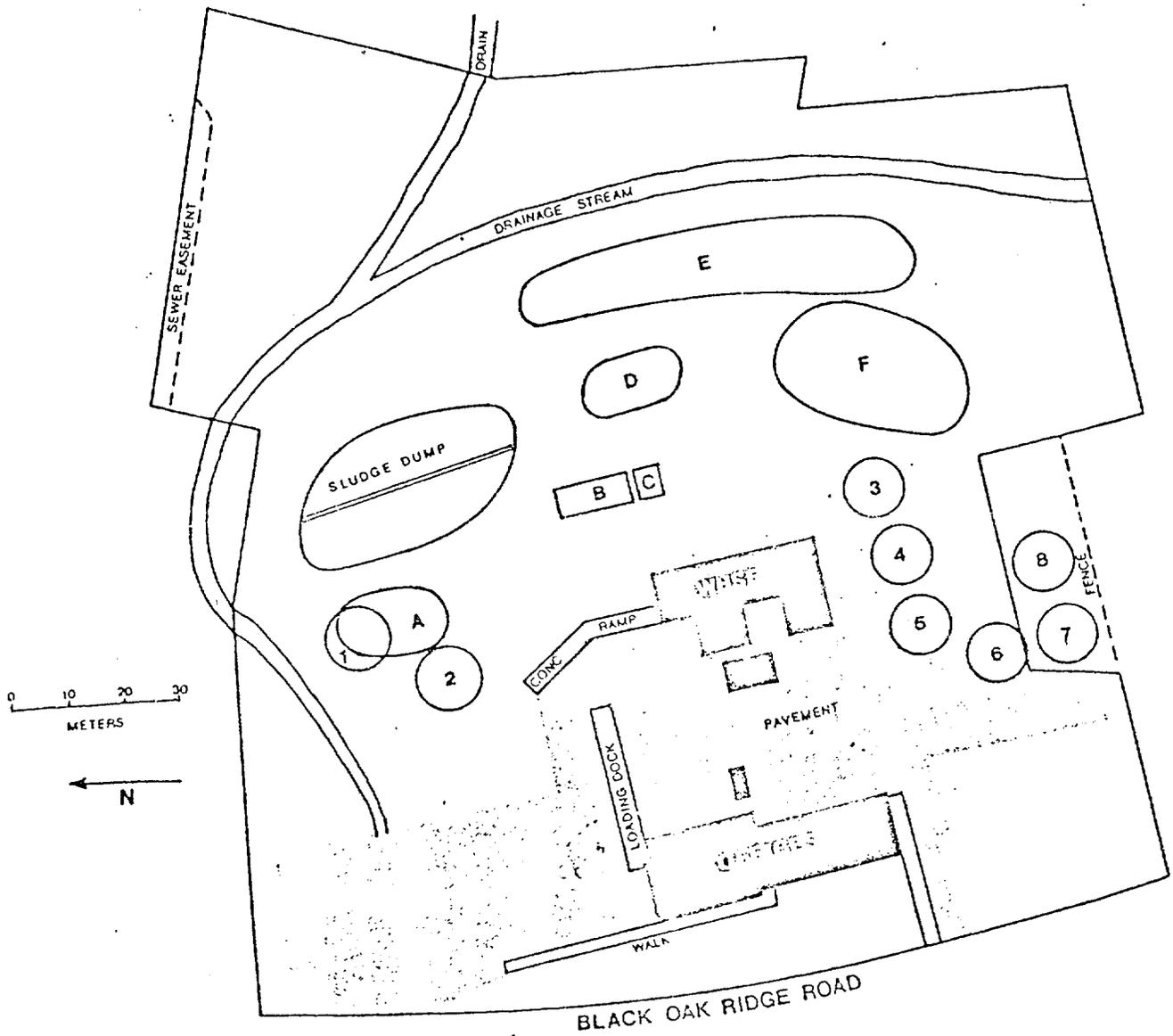
Because of the radiation doses at the site, I recommend that ENI be relocated to another location in Wayne and that the site be closed to other than remedial work.

DOE has the authority to take title to the site under FUSRAP and under Section 151(c) of the Nuclear Waste Policy Act of 1982. Under the latter law, Grace & Co. would have to pay the full tab for decommissioning the site. Even if DOE takes title to the site, there is a great danger that DOE will sit on the site and not take remedial actions. There is ample experience at

at other DOE sites to show that this is a real possibility. Representative Roe's efforts towards having DOE take title to the site are to be commended, but we should be aware that the Town and its citizens will have little control over actions on the site once DOE takes possession. Some mechanism must be established to allow the Town to have influence over DOE decisions regarding the site. In order to exert reasonable control, I suggest that the Town institute legal actions against responsible parties: NRC, DOE, Grace & Co and NJ DEP. The Town should join with other agreeable governmental bodies such as Lewiston, NY and Canonsburg, PA. With successful intervention in the court, the Town could sign a stipulation with the other parties which granted to the Town certain rights. As brought out at the last Council meeting at which I attended, the Town needs a legal memo for the Town Attorney detailing the issues and the likelihood of success. I am in the process of drawing up such a memo from a technical and quasi-legal perspective. The Town would then have to hire an attorney familiar with NRC and NJ law. My memo will suggest two names of highly regarded, reasonably priced attorneys.

DOE has not given much thought to what it would do with the many Manhattan Project sites (37 sites are in FUSRAP). It has recently suggested in the Federal Register that wastes from the Lewiston, NY site be either deposited in another Manhattan Project site, be transported for surface burial at Hanford, remain as is, or be dumped in the ocean. Another proposal ought to be considered by DOE, using the radioactive underground bomb cavities at the Nevada Testing Site for disposal of thorium and other Manhattan Project wastes. These bomb holes are already contaminated, ceramic lined and the water table is over a thousand feet below the surface.

Finally, there needs to be a consensus in the Town regarding what to do vis-a-vis the federal agencies and Grace & Co. Departing quite far from my charge by the Council to study NRC and DEP reports, I believe that the affected persons in the Town be allowed to express their views on what should be done. I would be happy to draw up a menu of options to provide a basis for discussions. Since federal funding and DOE's role will be key, DOE and Representative Roe should be among the participants under a format that is mutually agreeable.



A=Reworked Sludges
 B=Yttrium Concentrate
 C=Thorium Hydroxide
 D=Waste Treatment Disposal
 E=Ore Tailings and Gangue
 F=Yttrium and Silica Sludges
 1-8 = Circular Holes Filled April-June 1974 with debris and contaminated equipment resulting from decontamination of buildings.

FIGURE 6. Suspected Burial Locations on the W. R. Grace Property.

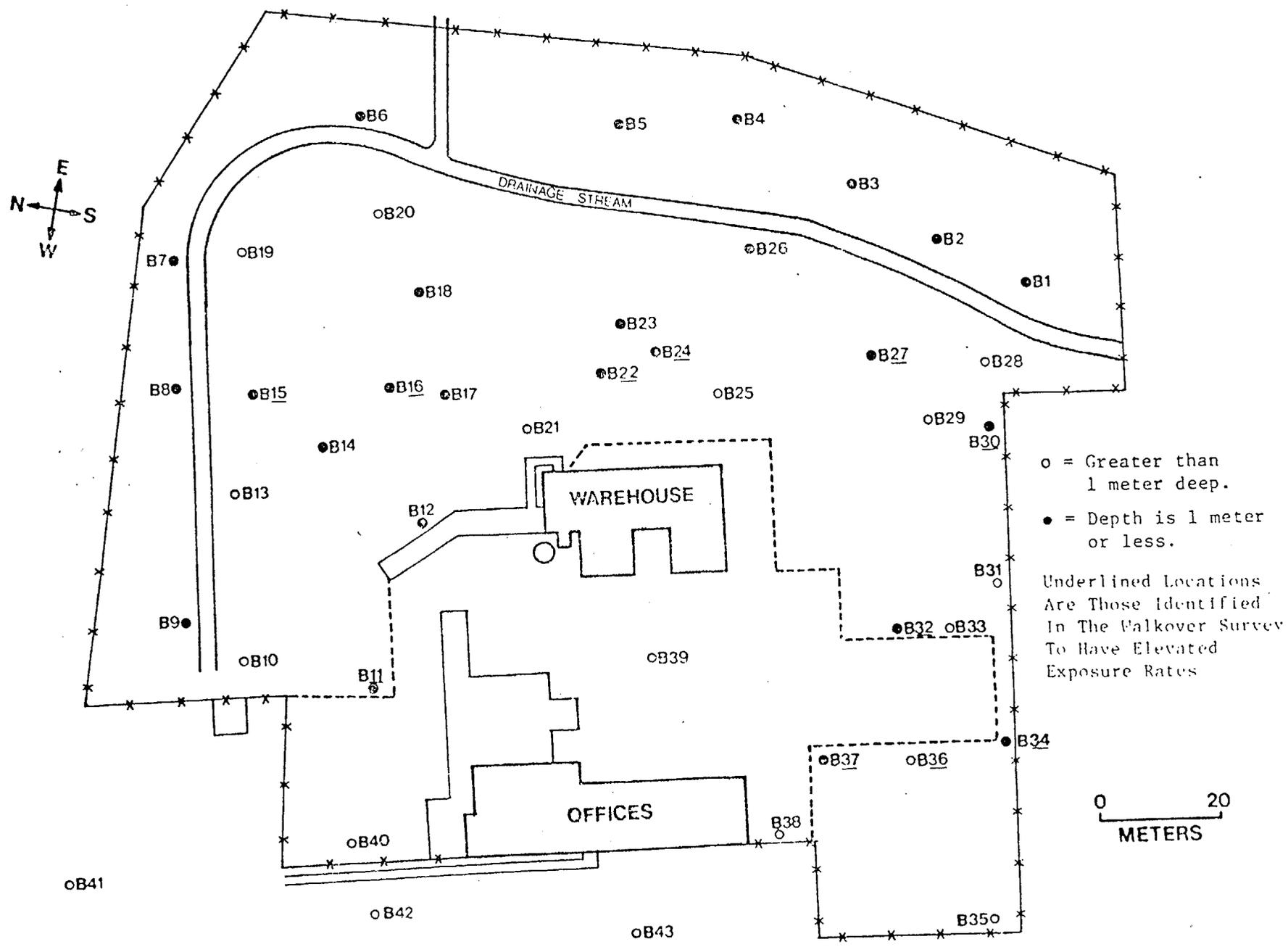


FIGURE 10. Borehole Locations on the W.R. Grace Property.

FEB 7 1983

Docket No. 040-00086

License No. STA-422

Duraturf Landscaping
ATTN: John Orr
48 Vahalla Way
Wayne, New Jersey 07470

Gentlemen:

SUBJECT: RADIOLOGICAL SURVEYS OF W.R. GRACE AND COMPANY PROPERTY, WAYNE, NEW JERSEY

Enclosed for your information is a copy of the subject report.

If you have any questions concerning this report, you may call me at (215) 337-5252.

Sincerely,

Original Signed By:

John D. Kinneman, Chief
Nuclear Materials Section A

Enclosure:
As stated

bcc:
Region I Docket Room (w/concurrences)

OFFICE	RI:DETP						
SURNAME	Kinneman						
DATE	2/4/83						

FEB 7 1983

Docket No. 040-C0086

License No. STA-422

Electronucleonics, Inc.
ATTN: E. Collins
868 Black Oak Ridge Road
Wayne, New Jersey 07470

Gentlemen:

SUBJECT: RADIOLOGICAL SURVEYS OF W.R. GRACE AND COMPANY PROPERTY, WAYNE, NEW JERSEY

Enclosed for your information is a copy of the subject report.

If you have any questions concerning this report, you may call me at (215) 337-5252.

Sincerely,

Original Signed By:

John D. Kinneman, Chief
Nuclear Materials Section A

Enclosure:
As stated

bcc:
Region I Docket Room (w/concurrences)

OFFICE	RI:DETP						
SURNAME	Kinneman						
DATE	2/4/83						

TOWNSHIP OF WAYNE

ARTHUR R. BARTOLOZZI, R.S., M.A.
HEALTH OFFICER
DIRECTOR OF HEALTH & WELFARE

475 Valley Road
Wayne, New Jersey 07470
(201) 694-1800
Police Department
(201) 694-0600

February 3, 1983

John D. Kinneman, Chief
Materials Radiological Protection Section
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 19406

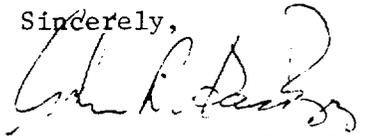
Dear Mr. Kinneman,

I have been directed by the Administration to seek information from you regarding the results of the Nuclear Regulatory Commission study at the W. R. Grace property late 1982.

The report was to have been released in mid December and later scheduled for January 1983.

I would appreciate your contacting me as soon as possible with any information in this regard.

Sincerely,



Arthur R. Bartolozzi
Health Officer

ARB:kms

cc: Mayor Walter Jasinski
John W. Leidy, Business Administrator



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

J. Kenneman RI

W. R. Grace Docket File
(10)

MAY 6 1983

MEMORANDUM FOR: John G. Davis, Director
Office of Nuclear Material Safety and Safeguards

FROM: Richard E. Cunningham, Director
Division of Fuel Cycle and Material Safety

SUBJECT: TELECON WITH KEN RINZLER, CONGRESSMAN ROE'S STAFF,
AND LOU VENTRE, CONGRESSWOMAN BOUGUARD'S STAFF

On May 3, 1983, G. Page was called by Ken Rinzler of Congressman Roe's staff saying that his "boss" had just heard that we had a meeting earlier in the day with W. R. Grace officials regarding possible licensing requirements, including remedial actions and proposed alternatives, for the Pompton Plains, New Jersey thorium site, and that he was greatly troubled that we would do this without first discussing the matter with him. He said that Congressman Roe believes that NRC should not become involved in possible remedial actions at the site because DOE's Authorization Bill will likely include \$2M to permit DOE to conduct a remedial action research and development project at the site.

Mr. Page informed Mr. Rinzler that he was not aware of the specific provisions of the proposed DOE Authorization Bill, but had heard that funding for a limited \$2M R&D project was being considered. It is unlikely, however, that \$2M will be sufficient to effect remedial actions if the preferred disposal alternative should be movement of the radioactive material to another location. Also, unless agreement is reached between NRC and DOE for the remedial actions to be conducted on a license-exempt basis, or unless the legislation limits NRC's statutory responsibility, NRC regulatory requirements would probably apply inasmuch as the residual thorium contamination resulted from an operation licensed by the NRC. Mr. Rinzler said the intent of the legislation is for DOE to be solely responsible for assuring that any needed remedial actions are taken and that NRC will in no way be involved. He requested Mr. Page to discuss this issue with Lou Ventre of Congresswoman Bouquard's staff and then directly connected Mr. Page to Mr. Ventre's office. Mr. Ventre could not speak with Mr. Page at that time and deferred the conversation to the morning of May 4.

Mr. Ventre said it was not possible for the legislation to spellout DOE and NRC roles and responsibilities; this will need to be worked out later. He confirmed Mr. Rinzler's statement, however, that the intent of the legislation is for DOE to have sole responsibility for carrying out the remedial actions at the site without any involvement or overview by NRC.

FC staff had planned to meet again with W. R. Grace staff in about two weeks to discuss possible licensing requirements and legal issues related to jurisdiction and application of NRC requirements. In view of the indications by Messrs. Rinzler and Ventre that DOE may shortly be given funds to initiate remedial actions and the apparent intent of the Congress for no NRC involvement in this matter, we propose to postpone any further meetings with W. R. Grace and plan not to initiate any actions to bring the Pompton Plains site under NRC license requirements until the DOE Authorization Bill is passed. At that time, we will determine what action, if any, NRC should take in this matter.



Richard E. Cunningham, Director
Division of Fuel Cycle and
Material Safety

cc: W. J. Dircks, EDO
C. Kammerer, OCA
J. Kinneman, RI
R. Fonner, ELD



A PLEASE NOTE FACSIMILE LOCATIONS ON THE BACK

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20545

"PLEASE"

FACSIMILE SERVICE REQUEST

USE DARK PEN WHEN FILLING OUT
AND REMOVE ALL STAPLES.

DATE: 4/18/83

MESSAGE TO: John Kinnaman, Region I

TELECOPY NUMBER: 488-1242
AUTOMATIC() MANUAL()

VERIFICATION NUMBER: 488-1334

NO. OF PAGES 8 EXCLUDING REQUEST SHEET DO YOU WANT ORIGINAL COPIES BACK? YES() NO ()

CITY & STATE: King of Prussia, Pa

MESSAGE FROM: W.T. Crow

BUILDING WILLSTE OFFICE PHONE 74570 MAIL STOP 396-25

SPECIAL INSTRUCTION: + NOTE TO RECIPIENT:
+ IF THERE ARE ANY PROBLEMS
+ CALL (301) 427-4287.
+
+*****
+ FOR OFFICE USE ONLY:
+ SENDER'S INITIALS: WTC
+
+ CERTIFIER'S NAME: _____

SERVICE: IMMEDIATE OTHER _____

4/18/83
4 16

RECEIVED

DISPATCHED



Department of Energy
Washington, D.C. 20545

APR 11 1983

Mr. R. G. Page, Chief
Uranium Fuel Licensing Branch
Division of Fuel Cycle and Material Safety
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Page:

In response to your March 11, 1983, letter, and reaffirming mine of February 18, 1983, the DOE will not assume responsibility for remedial actions at the Pompton Plains site.

Recent realignment of responsibility within DOE has consolidated our efforts related to identifying and conducting needed remedial action at former MED/AEC sites under the FUSRAP program. In structuring a uniform and consistent approach to determinations of responsibility and authority for FUSRAP, we have concluded that for sites formerly licensed by NRC or its predecessor, the first responsibility for determining current need for remedial action and the means for accomplishing it should remain with the Commission. Thus, as stated in my February 18, 1983, letter, consideration of such sites by DOE would be undertaken only as a result of a determination by NRC that:

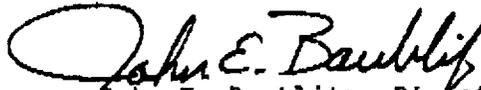
1. The conditions at the site constitute a public health and safety risk requiring remedial action, and
2. NRC cannot effect the required remedial action through enforcement actions or other methods.

We are currently evaluating our lists of potential FUSRAP sites to identify those we believe to be in the formerly licensed category. This information will be coordinated with your office to establish and maintain a mutually agreed to identification of such sites on a continuing basis.

With regard to the Pompton Plains site, specifically, the DOE involvement described in the enclosures to your letter clearly predates the realignment of responsibility within DOE. In that case DOE did take steps toward an evaluation of the site prior to any determinations on the part of NRC. Dr. Mott's letter of April 21, 1982, indicates that DOE "would have the authority to undertake remedial action to remove radioactive materials resulting from Contract No. AT(49-6)-993 if such action was required to protect public health and safety." However, as mentioned during our

meeting on February 8, 1983, the material produced under that contract accounts for less than 5 percent of the thorium at the Pompton Plains site, and most of the material produced under that contract is actually stored at the W. R. Grace facility at Curtis Bay, Maryland. An evaluation of the overall hazard at the Pompton Plains site (considering all materials present) has indicated that no health and safety hazard exists based on present use. A summary of this evaluation is enclosed for your information. Based on this data, we have concluded that remedial action by DOE cannot be considered required to protect public health and safety for the small amount of material at Pompton Plains resulting from Contract No. AT(49-6)-993. Therefore, DOE plans no further action at the site unless additional legislative authority is provided.

Sincerely,



John E. Baublitz, Director
Division of Remedial Action Projects
Office of Terminal Waste Disposal
and Remedial Action
Office of Nuclear Energy

Enclosure

Thorium Decay Series

Parent	Half-Life	Major Decay Products	Daughter
Thorium-232	14 billion years	alpha	Radium-228
Radium-228	5.8 years	beta	Actinium-228
Actinium-228	6.13 hours	beta, gamma	Thorium-228
Thorium-228	1.91 years	alpha	Radium-224
Radium-224	3.64 days	alpha	Radon-220
Radon-220	55 seconds	alpha	Polonium-216
Polonium-216	0.15 seconds	alpha	Lead-212
Lead-212	10.6 hour	beta, gamma	Bismuth-212
Bismuth-212	60.6 minutes	alpha (1/3)* beta (2/3)*	Thallium-208 Polonium-212
Thallium-208	3.1 minutes	beta, gamma	Lead-208
Polonium-212	0.0000003 seconds	alpha	Lead-208
Lead-208	stable	none	none

* Two decay modes are possible for Bismuth-212.

Uranium Decay Series

Parent	Half-Life	Major Decay Products	Daughter
Uranium-238	4.5 billion years	alpha	Thorium-234
Thorium-234	24 days	beta, gamma	Protactinium-234
Protactinium-234	1.2 minutes	beta, gamma	Uranium-234
Uranium-234	250,000 years	alpha	Thorium-230
Thorium-230	80,000 years	alpha	Radium-226
Radium-226	1,600 years	alpha	Radon-222
Radon-222	3.8 days	alpha	Polonium-218
Polonium-218	3 minutes	alpha	Lead-214
Lead-214	27 minutes	beta, gamma	Bismuth-214
Bismuth-214	20 minutes	beta, gamma	Polonium-214
Polonium-214	2/10,000 second	alpha	Lead-210
Lead-210	22 years	beta	Bismuth-210
Bismuth-210	5 days	beta	Polonium-210
Polonium-210	140 days	alpha	Lead-206
Lead-206	stable	none	none

))

**EVALUATION OF RADIATION EXPOSURES
AT THE FORMER RARE EARTHS, INC. PROCESSING SITE (W.R. GRACE)
WAYNE, NJ**

Surveys of the former Rare Earths, Inc., processing site (now the W.R. Grace site), certain offsite areas, and the area along Sheffield Brook identified levels of radioactivity and concentrations of radionuclides on and off the site in excess of normal background levels. Elevated levels were also found on some properties adjacent to or near the former processing site.

The radionuclides present are from the thorium and uranium decay series. These are naturally occurring substances, believed to have been created when the earth was formed, and present today in small quantities throughout our environment. They occur in soil, air, water, food, etc., and are the sources of a portion of the background exposure each person receives daily. Soils in the United States typically have thorium (Th-228 and Th-232) and uranium (U-234 and U-238) levels of 2 pCi/g and 1.2 pCi/g, respectively. Thorium concentrations in igneous rock are typically 2.6 pCi/g. Uranium concentrations in Florida phosphate rock and Tennessee bituminous rock average 80 pCi/g and 30-50 pCi/g respectively. Radiation exposures arising from these radioactive substances in their natural state are not the result of man's activities and, to a large extent, can be controlled only by relocating to regions of lower background levels.

Thorium and its associated decay products (the thorium decay series) are the principal radioactive substances present on the W.R. Grace site and offsite at nearby and adjacent properties and along Sheffield Brook. Thorium concentrations taken from the surface on the site ranged from background to about 8,000 pCi/g, while subsurface samples contained concentrations of thorium as high as 30,500 pCi/g. Soil samples from offsite areas contained thorium concentrations that ranged from background to about 3,800 pCi/g with the highest concentrations being found on adjacent properties. Data from the radiological surveys indicates that the thorium is natural thorium that is both in and out of equilibrium with its decay products in onsite samples. This suggests some of the samples were processed for thorium or certain isotopes were removed during rare earths processing. The samples collected for the Sheffield Brook survey appeared to contain natural thorium in equilibrium with the decay products. Radionuclides in the uranium decay series are present but in lower concentrations than the thorium series. On the site uranium-238 and radium-226 concentrations

ranged from about 0.3% to 35% of the thorium levels, while off the site along Sheffield Brook the uranium series radionuclides were less than 5% of the thorium series concentrations. As with the thorium series, the radionuclides in the uranium chain were also found both in and out of equilibrium depending on the areas from which samples were taken.

Evaluation of the various exposure pathways for thorium have determined that the primary pathway is direct exposure to gamma radiation associated with its decay series. Additional exposure could result from ingestion of contaminated food or water or through inhalation of airborne materials; however, under current use the contributions from these pathways would be small compared to direct exposure.

The National Council on Radiation Protection and Measurements has suggested a maximum recommended annual whole-body dose equivalent of 500 millirem (mrem)* per year to a member of the general population. This dose could result from continuous exposure to 57 microrentgen per hour ($\mu\text{R/hr}$) of gamma radiation or exposure to 250 $\mu\text{R/hr}$ for a normal work year (2000 hours). Gamma radiation measures taken at one meter on the site generally average from background levels to nearly 600 $\mu\text{R/hr}$ with certain small isolated areas measuring as high as 7700 $\mu\text{R/hr}$. The highest gamma levels were found in areas where residues were believed to be buried. Gamma radiation levels off the site averaged less than onsite levels with the maximum being less than 1000 $\mu\text{R/hr}$. Maximum and average measurements along Sheffield Brook were about 270 $\mu\text{R/hr}$ and 49 $\mu\text{R/hr}$ respectively.

To calculate annual radiation dose that might be received by an individual it is first necessary to estimate the amount of time that is spent in areas where elevated radiation levels occur. This is referred to as the "occupancy factor." Under current use conditions the contaminated areas both on and off the site are infrequently used. An occupancy factor of 10% (16.8 hours per week for 52 weeks per year) was selected for the purposes of estimating current use doses. Estimates of doses using the 10% occupancy factor are presented in Table 3.

*A mrem is 1/1000 of a rem and is a measure of radiation dose. An individual receives a radiation dose of 1 mrem as a result of being exposed to 1 milliroentgen (1000 μR) of gamma or x-ray radiation.

The estimated doses are less than the suggested NCRP standard at all locations evaluated for the 10% occupancy. The annual background dose from exposure to external gamma radiation is exceeded at only the warehouse area on the site. The values in Table 3 can also be compared with a typical chest x-ray (according to data from the Department of Health and Human Services) might yield an exposure of about 27,000 μ R. It should be noted that workers on the W.R. Grace site do not spend much time out of doors, hence, the 10% occupancy factor represents an overestimate of the dose being received by onsite individuals. Doses for the selected offsite locations also represent overestimates of exposure. As a result, the overestimate of occupancy factor and dose will similarly result in an overestimate in health risk from radiation.

The primary health effects associated with radiation exposure is increased risk of cancer. An individual receiving an estimated increased average dose of 140 mrem per year for his lifetime (70 years) would receive a cumulative dose of 9800 mrem. Assuming a lifetime risk factor of 100 fatal cancers per million people receiving 1000 mrem of wholebody radiation dose, the estimated increased risk for 9800 mrem would be 0.98 deaths per 1000 total deaths. Risks resulting from doses less than 140 mrem/year would be proportionally smaller. These risks can be compared to cancer death rates in Passaic County, New Jersey (1977 vital statistics--not age corrected) of 222.3 cancer deaths per 1000 total deaths.

Table 3. COMPARISON OF ESTIMATED DOSE RATES (ASSUMING 10% OCCUPANCY) TO BACKGROUND AND THE NCRP STANDARD

LOCATION	ESTIMATED EXPOSURE RATES	ESTIMATED ANNUAL DOSE RATES (mrem/yr)
<u>Onsite</u>		
- Outdoor areas near offices ^a	20-40 μ R/hr	17.5-35 mrem/yr
- Outdoor areas near warehouse ^b	\approx 160 μ R/hr ^d	\approx 140 mrem/yr
<u>Offsite</u>		
- Sheffield Brook area ^a	49 μ R/hr	42 mrem/yr
- School bus maintenance yard ^a	\approx 35 μ R/hr	31 mrem/yr
- Erie Lackawanna railroad area ^a	\approx 42 μ R/hr ^d	37 mrem/yr
External gamma background in New Jersey ^c	\approx 8 μ R/hr	\approx 70 mrem/yr ^c
NCRP Standard		500 mrem/yr

^a Estimated assuming the individual spent 16.8 hours per week for 52 weeks in contaminated areas of the site (areas where gamma radiation levels exceed about 20 μ R/hr).

^b Estimated assuming the individual spent 16.8 hours per week for 52 weeks in those areas of the site where gamma levels averaged greater than 60 μ R/hr.

^c Estimated assuming the individual receives the background dose for 100% of his time (8760 hr/yr).

^d Exposure rate for those areas above 20 μ R/hr or 60 μ R/hr as appropriate.

township of wayne

Region I

Alison/Cool

40-86

475 Valley Road
Wayne, New Jersey 07470

(201) 694-1800

Police Department

(201) 694-0600

'83 AUG 29 AIO:45

August 19, 1983

Nuclear Regulatory Commission
Washington, D. C.
20555



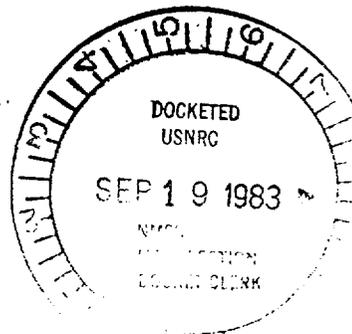
Gentlemen:

Enclosed is a certified copy of Resolution No. 179 of 1983 adopted by the Municipal Council of the Township of Wayne at a regular meeting held on August 17, 1983.

Very truly yours,


John R. O'Brien
Clerk

JRO/dlm
enc.



22818

TOWNSHIP OF WAYNE
COUNTY OF PASSAIC
STATE OF NEW JERSEY
1983
RESOLUTION NO. 179

A motion was made by Frederick Bauer seconded by Gary Webb that the following resolution be adopted:

OPPOSING "TEMPORARY" STORAGE OF THORIUM WITHIN
WAYNE

WHEREAS, the Township Council has reviewed the reports of the Center for Disease Control and the other reports forwarded by Congressman Roe on or about June 24, 1983 and the letter from the Department of Energy to Congressman Roe received by the Township on or about July 27, 1983;

NOW, THEREFORE, BE IT RESOLVED by the Municipal Council of the Township of Wayne as follows:

1. The Township Council vehemently disagrees with the conclusion in the Department of Energy letter received by the Township on or about July 27, 1983 that the waste to be removed from the various off-site areas be stored "temporarily on the W.R. Grace Company site" because while the Township Council agrees that a disposal site must be designated and made available for the waste now being temporarily stored on the W.R. Grace site, the Township Council believes that a long term solution should be sought now with a view to the immediate removal of both off-site and on-site waste from the Township of Wayne and the Township of Pequannock without "temporary" storage of the waste on-site.
2. The Township Council opposes the acquisition of the W.R. Grace site by the Department of Energy or by any other governmental agency, unless the acquisition is made in connection with the simultaneous removal of all on-site and off-site contamination.
3. The Council opposes any additional storage of thorium and/or its byproducts on the W.R. Grace site and on any other site in the Township of Wayne. This includes our opposition to the movement of any off-site thorium onto the W.R. Grace site.
4. The letter from the Department of Energy received on or about July 27, 1983 refers in the fourth paragraph to "early discussions with the owner, N.R.C., and the State of New Jersey." The Township Council strongly urges that the Township of Wayne and the Township of Pequannock be included in these discussions.
5. The Council again urges the N.R.C. to hire a hydrogeologist for the purpose of testing all aquifers which have any contact with any area on which thorium and/or its byproducts are located in Wayne and in Pequannock.
6. The Council supports and urges that the additional testing requested by the Center for Disease Control be performed immediately.
7. The Council requests that Dr. Resnikoff immediately receive copies of all reports received.
8. The Council wishes to thank Congressman Roe for his continuing efforts to bring about the removal of on-site and off-site thorium from Wayne Township and from Pequannock Township.
9. Copies of this Resolution shall be sent to Congressman Roe, the U.S. Center for Disease Control, the Nuclear Regulatory Commission, the U.S. Department of Energy, the State Department of Environmental Protection and our State Legislators.

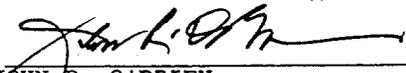
ROLL CALL:

AYES: Frederick Bauer, Joseph Di Donato, William Hance,
Robert Pacca, David Waks, Gary Webb, Joseph Loffredo

NAYS: None

ABSENT: Joyce Amabile, Bert Tucker

THIS IS TO CERTIFY THAT THE FOREGOING IS A TRUE AND EXACT
COPY OF A RESOLUTION ADOPTED BY THE MUNICIPAL COUNCIL OF
THE TOWNSHIP OF WAYNE AT A REGULAR MEETING HELD ON
AUGUST 17, 1983.



JOHN R. O'BRIEN
CLERK

JAN 18 1983

MEMORANDUM FOR: Ralph G. Page, Chief, Uranium Fuel Licensing Branch, NMSS

FROM: James H. Joyner, Chief, Nuclear Materials and Safeguards Branch,
Region I

SUBJECT: DRAFT RADIOLOGICAL SURVEY OF THE W. R. GRACE and CO. PROPERTY,
WAYNE, NEW JERSEY

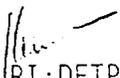
We have reviewed the subject draft report; our detailed comments are contained in the enclosure. We are impressed with the amount and apparent quality of the data presented. Our two major comments, which are elaborated in the details, are that more complete presentations of the surface and one meter exposure data are necessary and that clearer conclusions about the actual conditions of the site are necessary. We believe guidelines or criteria should not be discussed in the report. Since we expect that many nontechnical individuals will read this report we have asked for more detailed explanations and clarifications than we normally would in a technical report.

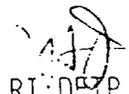
With regard to paragraph numbers in the enclosure, the first full paragraph on the page is numbered 1.

If we can be of any additional assistance, please let us know.

Original Signed By:

James H. Joyner, Chief, Technical
Programs Branch, Division of
Engineering and Technical Programs


RI:DETP
Kinneman/hh
1/18/83


RI:DETP
Joyner
1/18/83

OFFICIAL RECORD COPY

Enclosure
REGION I COMMENTS ON THE DRAFT RADIOLOGICAL SURVEY
AT THE W.R. GRACE AND CO. PROPERTY

1. page 3, para. 2 - The offsite storm sewer system should be described. A diagram like Figure 9 in the Radiological Survey of Sheffield Brook, Wayne, New Jersey, should be included.
2. page 3, para. 3 - Delete "also" from second sentence.
3. page 4, para. 2 - Was the property south of the W. R. Grace site once part of the Grace property? If it was, this should be made explicit.
4. page 6 - Since this report will be read by many nontechnical persons, the difference between "exposure" and "dose" should be defined or deleted. (See Comment 10). As presently written, the report is confusing.
5. page 6, para. 3 - We do not believe that an Eberline HP-260 probe has a "shielded" configuration. Please explain how shielded measurements were made.
6. page 7, para. 2 - This should be rewritten to make clear that the entire area between the concentration of higher radiation levels and the isolated points of higher radiation levels to the south on the railroad was surveyed and no elevated reading found.
7. page 9, para. 3 - Were vegetation samples washed?
8. page 10, para. 2 - Aren't the baseline values for surface beta-gamma dose rates a little high? A reference should be provided and the results compared to published values.
9. page 11, para. 2 - The distinction between "systematic" measurements and the "surface scan" is subtle here and in other places. It should be made explicit or the distinction dropped.
10. page 11, para. 3 - It should always be explicitly stated whether surface or 1 m data is being discussed. We believe the fact that the dose rates are higher than the exposure rates may be a result of the measurement technique. If there is some significance attached to this difference it should be explained; if not, it should be deleted. Suggested rewrite of paragraph:

"Individual surface dose rate data are not presented in this report; the pattern of these dose rates is in good agreement with the pattern of the exposure rates described above. Unshielded HP-260 probe measurements ranged from 25 to 40 percent higher than measurements performed with the probe face shielded, indicating a significant dose contribution from beta and low-energy photon radiations. This is consistent with the thorium contamination found."

11. page 13, para. 1 - Last sentence should read, "These differences suggest that the materials encountered represent residues from different processes and stages in operations conducted at the site."
12. page 13, para. 2 - Last sentence is in conflict with last sentence on page D-2.
13. page 13, para. 3 - We do not understand the significance of the observation in the last sentence on page. It should be explained or dropped.
14. page 14, para. 1 - It appears that numbers with a "<" are MDA's here and throughout report. If this is so, then "MDA" should be explained. We suggest, "where results are reported as less than Minimum Detectable Activity (<MDA), this means that the radionuclide was not present to the best of our ability to measure it." Also it should be explained why MDA's for the same nuclide vary throughout report.
15. page 14, para. 3 - A more complete explanation should be provided of why the borehole water samples are not representative of ground water.
16. page 14, para. 3 - Last sentence conflicts with page 20, para. 2 and page 21, para. 4.
17. page 14, para. 4 - We believe the statement, "The disequilibrium ... is unexplained" is inappropriate. Since vegetation is the subject, this could easily be preferential uptake. Also, the word "significant" is ambiguous. Does it mean there were some isotopes detected above MDA or not? Also, why were Ra-228 values directly measured for these samples and not for other samples?
18. page 15, para. 1 - Does "Maximum exposure rates" refer to surface or 1 m? If to surface, why are 1 m rates not discussed? "Direct radiation levels" is unclear; does it mean surface exposure, dose rate, or exposure at 1 m? The type of floor (concrete, board) should be specified.
19. page 15, para. 3 - Drop "The" and begin final sentence "Two samples ..."
20. page 16, para 1 - Previous discussions began with rates at 1 m. To avoid confusion, this one should also.
21. page 17, Discussion - All of the material on guidelines, etc. should be deleted. The purpose of this report is to describe the site objectively. The discussion should summarize the observations concerning the site and provide statements of conclusions about how things are at the site. Questions which might be answered include, Are observed conditions consistent with described uses of the site? How has this site changed in the last few years? How is it likely to change in the future?

A suggested rewrite is:

"This survey identified thorium contamination in soil on the W. R. Grace site, the adjacent property south of the site, and a section of the Erie Lackawanna Railroad in neighboring Pompton Plains. Elevated radiation levels are associated with the thorium contamination, as expected. The contamination on the adjacent property south of the site and the Erie Lackawanna Railroad appears to consist of unprocessed thorium ore and is mainly concentrated near the surface. The contamination on the W. R. Grace site is consistent with the reported processing of large quantities of thorium bearing ores and the burial of wastes and residues from this processing on the site.

W. R. Grace Site

"Contamination on the W. R. Grace and Company site apparently originated from on-site storage and shallow land burial of ores, wastes, residues and contaminated equipment from previous operations. The ground radar study and the relatively high thorium surface contamination levels in some locations suggest that wastes were not always buried in well defined trenches and that buried wastes may have been disturbed and spread over the eastern portion of the property."

"Analysis of samples taken from boreholes and measurements at suspected burial locations indicated higher thorium concentrations in the subsurface soil than in the surface soil. Thorium concentrations in surface soil samples collected east and north of the drainage stream (well away from the burial areas) and along the western property boundary were slightly elevated. Thorium concentrations in surface and subsurface soil collected near the south property boundary were also elevated."

"Due to the extensive disturbance of soil on the property, the lack of agreement between site personnel and the ground-penetrating radar results concerning the burial locations, and because of intentional avoidance of drilling into suspected burial trenches, it was not possible to estimate the total volume and activity of wastes on the site." *(Continue with para. 3 on page 19).*

22. page 19, para. 3 - The statement, "This includes the warehouse building, which is occupied during normal working hours" needs to be expanded. The statement apparently refers to the warehouse on the W. R. Grace site, but no presentation of the radiation levels in this warehouse is contained in the report. Diagrams similar to Figure 15 should be provided for surface and 1 m exposure rates.
23. page 19, final para. - The discussion of migration is very confusing. It should define what is migrating and whether migration is still occurring or not.

These statements should be made before possible pathways are discussed. Also, evidence for migration (e.g., the observations of survey team) should be presented. A diagram of site contours and/or surface drainage routes would be helpful here.

24. page 20, para. 1 - See item 16.
25. page 20, para 4 - Does "Direct Radiation Levels", refer to 1 m or surface?
26. page 21 - Suggested rewrite:

Summary

"At the request of the Nuclear Regulatory Commission, the ORAU Radiological Site Assessment Program conducted a radiological survey of the W. R. Grace and Co. site in Wayne, New Jersey, properties adjacent to the W. R. Grace and Co. site and a section of the Erie Lackawanna Railroad in neighboring Pomptom Plains. The survey found extensive thorium contamination in soil and elevated radiation levels on portions of the W. R. Grace and Co. site. Radionuclide concentrations in the sediment and water collected from the on-site storm sewer system indicate ... " [a proper conclusion of what is occurring presently should be used to complete sentence.]

page 21 - Continue with same 3rd and 4th paras., but add the word "elevated" before "thorium concentrations" and delete "direct" and "which exceed the NRC guidelines" from the first sentence of para. 3.

27. page 25, Figure 5 - The words "burial ground" or "burial" are used frequently in the report; it would be helpful if the area referred to was shown or outlined (in color?) on this figure. Revise caption: "1-8 = Circular holes filled April - June 1974 with debris and contaminated equipment resulting from decontamination of buildings."
28. page 9, Figure 9 - Is there a difference between the open and closed circles?
29. page 33, Figure 13 - General Comments on this figure and Figures 14, 15, 16, and 17. It is confusing to have one figure map out exposure rates at 1 m for one area while a similar figure for another area provides surface exposure rates. We recommend that both surface and 1 m exposure rates be mapped for the site, the warehouse on the adjacent property and the railroad property. The exposure rates at the boundary between the site and the south property are not well shown in the present Figures.
30. All Tables - Same comment as previously regarding "MDA".
31. page 40, Table 2 and all tables presenting Th-232 results - The first column is headed Th-232 (Ra-228). It appears that Th-232 was assumed to be equal to Ac-228, which was actually measured. However, the heading implies Ra-228 was measured, but it appears Ra-228 was only measured for water samples and some vegetation samples. This could be cleared up by a note or additional explanation on page D-2.

32. page 49, Table 6 - Why no water sample from D-14? What does "0" in D-10 mean? Footnote "c" reference is missing.
33. page 52, 53, 54, Tables 9, 10, 11 - Footnote order is reversed from previous tables.

Ground Penetrating Radar Report.

34. page 18, - Units, "Si/meter", have not been defined.
35. page 21 - It is not clear why use of 300 MHz was precluded.
36. The mixture of "feet" and "meters" throughout report is confusing.
37. page 26 - The statement, "Particularly interesting (misspelled in report) is one which crosses the south lawn and parking area and enters the burial ground from the west", should be explained.
38. page 26, para. 2 - What conclusions did they draw?
39. page 27, Figure 10 is very difficult to read.
40. page 28, Does, "With few exceptions, most of the subsurface objects were detected at an apparent depth of less than 4 feet" mean that no burial is deeper than four feet? We doubt this is true, so it should be explained. The last sentence is an example of the type of clear conclusion which will make the report more useful.
41. page D-1 - Why is a conversion factor (incomplete in the report) listed for beta-gamma and no other - we suggest that this be made uniform.
42. page D-2 - Last sentence conflicts with other parts of report.
43. page D-4 - Were vegetation samples washed?



Oak Ridge
Associated
Universities

Post Office Box 117
Oak Ridge, Tennessee 37830
Telephone (615) 576-3388

Manpower Education,
Research, and Training
Division

January 12, 1983

*W.R. Grace
Deed file
②*

Mr. William Crow
Div. Fuel Cycle & Mat. Safety
MS-SS396
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Crow,

Enclosed is a draft of the report, "Radiological Survey of
the W. R. Grace Property, Wayne, New Jersey", for your review and
comments.

Respectfully yours,

Paul W. Frame
Team Leader

PWF/dh

Enclosure

cc: John Kinneman
Ron Mace

10

TO GIVE YOU INFORMATION

6

ITEM #

E/85
11/11/85

FOIA-
Act, exemptions 6
2000-0101
in accordance with the Freedom of Information
information in this record was deleted

TO GIVE YOU INFORMATION



X Morton Realty, Inc.
861 Black Oak Ridge Road
Wayne, New Jersey 07470

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SGL Industries
76 Euclid Avenue
Haddonfield, New Jersey 08033

Block No. 591C/50

X Township of Wayne
475 Valley Road
Wayne, New Jersey 07470

Block Nos. 5915/6 and
590/1