

FEB 18 1997

Theo W. Muller, President and
Chief Executive Officer
RTI, Inc.
Process Technology of North Jersey Facility
108 Lake Denmark Road
Rockaway, New Jersey 07866

Dear Mr. Muller:

Please find enclosed Amendment No. 38 terminating License No. 29-13613-02 as requested by letter dated May 23, 1996. Areas A, B, C and D as described on Amendment 37 of your license dated August 7, 1996, located at 108 Lake Denmark Road, Rockaway, New Jersey are released for unrestricted use.

Since you have elected to terminate your licensed activities, financial assurance is no longer required. Therefore, we are returning to you the original executed documents of your Trust Agreement. If you have any questions, please do not hesitate to contact Anthony Dimitriadis of my staff at (610) 337-6953 or me at (610) 337-5200.

Your cooperation with us is appreciated.

Sincerely,

Original Signed By:

Ronald R. Bellamy, Chief
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

License No. 29-13613-02
Docket No. 030-07022
Control No. 114377

Enclosures:

1. Amendment No. 38
2. RTI Letter dated July 25, 1990
3. Trust Agreement dated July 24, 1990
4. Specimen Certificate of Events dated July 24, 1990
5. Acknowledgement Certificate dated July 24, 1990
6. Certificate of Resolution dated July 23, 1990
7. Trust Agreement Schedule (Schedule A)

cc:

John D. Schlecht
Radiation Safety Officer
RTI, Inc.
Process Technology of North Jersey Facility
108 Lake Denmark Road
Rockaway, New Jersey 07866

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

29-13613-02

Docket or Reference Number

030-07022

Amendment No. 38

RTI, Incorporated
Process Technology of North Jersey Facility
108 Lake Denmark Road
Rockaway, New Jersey 07866

In accordance with your letter dated May 23, 1996, License Number 29-13613-02 is hereby terminated.

Date

FEB 18 1997

For the U.S. Nuclear Regulatory Commission

Original Signed By:

Ronald R. Bellamy

By

Nuclear Materials Safety Branch
Region I

King of Prussia, Pennsylvania 19406

January 24, 1997

Paul Giardina, Chief
Radiation and Indoor Air Branch
Environmental Protection Agency
Region II
290 Broadway, 28th Floor
New York, New York 10017

Dear Mr. Giardina:

In 1990 the NRC staff identified approximately 50 sites that warranted special Nuclear Regulatory Commission oversight which created the Site Decommissioning Management Plan (SDMP) list. This list was created to ensure timely and safe remediation of residual radioactive material in excess of the current NRC criteria for release for unrestricted use. One of the sites on the SDMP list is the RTI, Inc., facility in Rockaway, New Jersey.

The staff added this site to the SDMP list for the following reasons:

1. Onsite disposal had been made but the location and extent of the disposals were not well-known;
2. The extent and location of soil contamination on this site were not well-known;
3. Past problems with licensee management led to uncertainty about the licensee's willingness and ability to remediate this site in a timely and effective manner; and
4. The NRC staff had concerns about the licensee's compliance with the financial assurance provisions outlined in 10 CFR 30.35.

This is to inform you that NRC is considering removing this site from the Site Decommissioning Management Plan (SDMP). Based on the actions taken by the licensee, our review of the surveys performed, and the results of the confirmatory survey, the staff plans to formally notify the licensee, by letter, that NRC plans no further action on this site. Anthony Dimitriadis of my staff discussed the results of the confirmatory survey with George Bruzowski of your staff on January 16, 1997.

P. Giardina
EPA, Region II

-2-

If you have any questions about this letter, please do not hesitate to contact Anthony Dimitriadis of my staff at (610) 337-6953, or me at (610) 337-5200. Your cooperation with us is appreciated.

Sincerely,

Original Signed by:

J. J. Kottan

Ronald R. Bellamy, Chief

Decommissioning and Laboratory Branch

Division of Nuclear Materials Safety

License No. 29-13613-02
Docket No. 030-07022

cc: State of New Jersey



POLICY ISSUE

(NEGATIVE CONSENT)

January 24, 1997

SECY-97-019

FOR: The Commissioners

FROM: Hugh L. Thompson, Jr.
Acting Executive Director for Operations

SUBJECT: REMOVAL OF RTI, INC., FROM SITE DECOMMISSIONING
MANAGEMENT PLAN

PURPOSE:

To inform the Commission that remedial action has been completed at the RTI, Inc., site in Rockaway, New Jersey. The staff plans to release the site for unrestricted use and remove the site from the Site Decommissioning Management Plan (SDMP).

SUMMARY:

The licensee has resolved all outstanding issues related to former onsite disposals, soil contamination, and financial assurance. Based on the actions taken by the licensee, the results of the licensees' final surveys, and the results of Nuclear Regulatory Commission confirmatory surveys, the staff plans to notify the licensee, by letter, that the NRC "plans no further action on this site." Region I discussed the results of the surveys with the State of New Jersey, Department of Environmental Protection. New Jersey representatives indicated that they have no unresolved concerns regarding the radiological issues at the site.

BACKGROUND:

In SECY-90-121, the original SDMP, and in subsequent revisions to the SDMP (SECY-91-096, -92-200, -93-179, and -95-209), the staff identified approximately 50 sites that warranted special NRC oversight, to ensure timely

NOTE: TO BE MADE PUBLICLY AVAILABLE WHEN
THE FINAL SRM IS MADE AVAILABLE

CONTACT: A. Dimitriadis, RI
(610) 337-6953

and safe remediation of residual radioactive material in excess of the current NRC criteria for release for unrestricted use. One of these sites is the RTI, Inc., facility in Rockaway, New Jersey.

The staff added this site to the SDMP list for the following reasons:

1. Onsite disposals had been made but the location and extent of the disposals were not well-known;
2. The extent and location of soil contamination on this site were not well-known;
3. Past problems with licensee management led to uncertainty about the licensee's willingness and ability to remediate this site in a timely and effective manner; and
4. The NRC staff had concerns about the licensee's compliance with the financial assurance provisions outlined in 10 CFR 30.35.

This facility was originally licensed as Radiation Technology Incorporated in 1970. RTI, Incorporated (RTI) -- the current company name -- was licensed to operate a megacurie pool irradiator near Rockaway, New Jersey. The site is located in a suburban location on approximately 6 hectares (15 acres) of land in northeastern New Jersey. The irradiator and facility buildings occupy a 2-hectare (5-acre) fenced site on the north side of Lake Denmark Road about 90 meters (300 feet) south of Lake Denmark. RTI also owns approximately 81 hectares (201 acres) of property, directly across the road from the licensed site.

The irradiator uses up to $1.1 \text{ E}+17 \text{ Bq}$ (3 million curies) of Cobalt-60 (Co-60) in sealed sources to produce high-intensity gamma ray fields for the sterilization of disposable medical supplies. In addition, RTI irradiates, to a much lesser extent, cosmetics, hospital supplies, and pharmaceuticals, as well as spices and food containers. Irradiation services are supplied principally to manufacturers whose products are prepackaged for irradiation before delivery to the site. The Co-60 sources are stored in a pool of water for shielding when the source racks are not in use. RTI operates two other facilities located in North Carolina and New Jersey. The irradiator at the Rockaway facility is surrounded by a concrete biological shield. The facility is constructed of ordinary reinforced concrete.

In 1976 and 1977, the licensee disposed of solid radioactive waste by burial onsite. These burials were intended to be made pursuant to 10 CFR 20.304, but the documentation of such burials was poor. The only documented burials were located in the northeast corner of the 2-hectare (5-acre) fenced area of the site, and included the spent resins used in pool cleanup activities. The extent of these burials was unknown. These burials also resulted in Co-60 soil contamination in the areas around the burials.

In the late 1970s, a product commercially known as "radwood" evidently struck one of the stationary source racks as the tank containing the radwood was

being lowered into the pool, damaging one of the sealed sources. Leakage from the damaged source resulted in Co-60 contamination of the irradiator storage pool water. The contamination was not immediately identified. Flocculent and other cleaning agents used in cleaning the (believed uncontaminated) pool of dirt and algae were swept onto the ground south of the irradiator building. During the first few years after the introduction of the contamination from the damaged source, the resins used for pool cleanup activities were disposed of in onsite burial pits.

Once identified in 1986, the Co-60 contamination in the pool was removed primarily via the water treatment system, by ion exchange on the resin demineralizers and by adsorption on activated charcoal and diatomaceous earth. As the contamination in the pool water diminished, it became permissible to regenerate the resins. Each regeneration resulted in 1100 to 1500 liters (300 to 400 gallons) of backwash water. The backwash water was chemically neutralized and analyzed for radioactive material concentration before disposal. Backwash water was disposed of by pumping the water onto the ground outside of the equipment room, on the south side of the irradiator building. Although there are no indications that the level of Co-60 in the backwash water exceeded the limit permitted by 10 CFR Part 20, over a period of several years this method of disposal caused a significant accumulation of Co-60 on and near the surface of the ground immediately south of the irradiator building.

RTI has also been the subject of several escalated enforcement actions. In connection with a 1986 investigation of the licensee's facility, NRC temporarily suspended the Company's license to operate for an aggregate of 77 days. The suspension was based on willful violations of NRC regulations involving deliberate bypassing of certain safety systems designed to protect plant workers from accidental exposure to radiation. In addition, Company officials pled guilty to two felony convictions for willfully providing false information to NRC and were fined \$100,000. The Company officials were found guilty and sentenced to two-year prison terms for violating conditions of the license and willfully providing false information to NRC.

In April 1986, the RTI Board initiated major changes in personnel, equipment, and key management positions, in response to NRC escalated enforcement. These changes were intended to make the personnel more cognizant of regulations applicable to the licensed activities onsite. Inspections, interviews, direct observations, and reviews of old records by staff and the new management revealed that past management practices had resulted in accumulation of poorly documented low-level contaminated waste at the Rockaway facility. In response to these findings, the new management initiated a series of remedial action tasks to identify, characterize, and remediate the site, to come into full compliance with Federal and State regulations. NRC eventually renewed the license for a probationary period of six months. Since that time the licensee has been in good standing.

Finally, in 1990, staff informed the licensee that, based on the possession limits for the sealed sources in the irradiator and the Co-60 contamination listed on the license, an additional \$150,000 would be required for financial

assurance. The licensee provided adequate financial assurance for the sealed sources in the irradiator, but argued that the possession limit for Co-60 contamination listed on its license should be reduced based on surveys and remediation activities performed to date. Staff maintained that radioactive contamination was present and as such, this licensee would be required to either submit appropriate financial assurance, or provide evidence that the site could meet the guidelines for unrestricted release.

In April 1996, SteriGenics International notified NRC that it planned to purchase the stock of South Jersey Process Technology, Inc. (RTI's Salem, New Jersey, facility) and lease the irradiator facility in Rockaway, New Jersey, from RTI, Inc. This SteriGenics International purchase of RTI stock also included the purchase of RTI's third irradiator facility in Haw River, North Carolina. SteriGenics International operates seven commercial irradiators in the United States, under various Agreement State licenses, and one facility in Ohio, under NRC jurisdiction. SteriGenics was issued a new license for the Rockaway, New Jersey, irradiator facility on August 8, 1996. The remediated areas on the Rockaway site remain as a separate license issued to RTI, Inc.; this license will be terminated after removal of this site from the SDMP list. The license issued to SteriGenics for operations of the irradiator will not be affected by this action.

DISCUSSION:

During a search of buried chemical and possibly radioactive waste in December 1986, RTI informed Region I of the initial findings of excavations conducted on the northeast corner of the property. Initial radiation surveys were performed and exploratory excavations were made in areas where burials were believed to have occurred. One of the excavations resulted in a positive identification of buried radioactive material, including resin material used in pool cleanup activities and other equipment such as disposable gloves that had been disposed of in burial pits within the fenced site. Radiation levels indicated a reading of $1.6 \text{ E-}7 \text{ C/kq/hr}$ (600 microR/hr) at the bottom of one excavation. Soil and water samples taken from the same excavation revealed no radioactive contamination. However, Co-60 contaminated soil was identified outside the fenced site in a wooded area, evidently resulting from surface water run-off in that area. In addition, a small amount of cesium-137 contamination was identified in an area north of the fence, evidently resulting from wash-off of external contamination from a shipping cask.

In March 1987, Region I identified specific documentation that revealed that burials or re-burials of radioactive waste (i.e., material that was reportedly buried between 1976-1977 which might have been unearthed and re-buried between 1981-1982) had occurred. In response to these findings, Region I accelerated actions to characterize the RTI property and issued a Confirmatory Action Letter (87-92) that documented the licensee's commitments to: 1) comprehensively survey the suspected portions of the property inside the 2-hectare (5-acre) fenced site; 2) develop a plan to detect buried matter via non-invasive techniques (i.e., ground-penetrating radar), by a qualified contractor; and 3) develop a remediation action plan for any contamination identified and inform the regional office before performing any invasive

action to explore or uncover buried waste.

Region I also contracted Oak Ridge Associated Universities (now Oak Ridge Institute for Science and Education) to perform an independent characterization survey of the unrestricted areas of RTI's property.

On April 6, 1987, a magnetometry scan was performed, over a wide area of the RTI property, that indicated that ferromagnetic materials were buried on parts of the site, specifically on the northeast corner of the fenced area. On April 13, 1987, Oak Ridge Associated Universities initiated an independent characterization survey of the unrestricted areas of RTI's property to determine if the licensee's contamination control procedures had been effective in the past. The survey identified four areas contaminated with Co-60 in excess of NRC guidelines. Three of the areas were located within the fenced area of the site and the fourth was located outside the fenced area along a creek that drains into Lake Denmark. One of the locations within the fenced area of the site included a survey immediately south of the irradiator building, which indicated that the soil was slightly contaminated with Co-60 and Cs-137. The cesium contamination was most likely from a contaminated GE model 1500 cask that was periodically used and situated at this location.

The licensee submitted a remedial action plan and schedule in May 1987 and remediation began on June 4, 1987. Based on the magnetometry scan performed earlier that year, five separate pits were selected for excavation. The remediation began by initiating excavation of pit 1. The final size of pit 1 was 15 meters (50 feet) long, 9 meters (30 feet) wide, and 2.7 meters (9 feet) deep. Excavation of pit 1 unearthed a number of contaminated items including drums, pails, diatomaceous earth pumps, resins, filters, and poly bags containing contaminated items. Excavation of pits 2 and 3 unearthed debris consisting of rotted wood, corroded metal objects, and gravel, but no radiological nor hazardous wastes were encountered, based on direct radiation measurements and independent analysis of split soil samples taken from pits 2 and 3 by the licensee and NRC. Excavation of pits 4 and 5 also revealed no radiological nor hazardous wastes. Backfilling of the excavated pits was completed in October 1987 and liquid/sludge analysis was performed. The contaminated soil and dry waste were collected, packaged, and shipped for disposal at a commercial radioactive waste disposal facility in Barnwell, South Carolina. Approximately 14 m³ (500 ft³) of waste were sent for disposal as radioactive waste. Between June and October 1987, Region I inspected the characterization and remediation activities on at least seven separate occasions, including all of the excavations listed above.

In July 1989, the licensee proposed to remediate the area inside the 2-hectare (5-acre) fenced site to 0.55 Bq (15 pCi) of Co-60 per gram of soil and to place a concrete cover over the area south of the irradiator building and to maintain it as a restricted area for at least 5 years (one half-life for Co-60). In May 1990 NRC agreed on the condition that the licensee commit to further remediate the areas if they were to be released for unrestricted use. NRC also required the licensee to provide evidence demonstrating that no additional buried radioactive material or soil contamination in excess of 0.3 Bq/gram (8 pCi/gram) of Co-60 remained onsite. In addition, the licensee was

required to provide plans to monitor for potential migration of Co-60 contamination and to provide results of surveys performed to show that remediation activities had been completed as originally proposed. Since no soil contamination in excess of 0.3 Bq/gram (8 pCi/gram) of Co-60 remains, no concrete cover was installed.

In July 1990, the licensee performed limited core sampling as evidence that no contamination existed inside and outside the fenced area of the site. Between 1990 and 1995, licensee efforts to decommission the site continued. In June 1995, NRC required additional surveys and sampling as further evidence to verify that these areas met the release criteria. Since the primary pathway for exposure of individuals from Co-60 is by direct radiation, the licensee and NRC conducted radiation-level surveys. Surveys performed by the licensee on April 24, 1996, showed that radiation levels averaged between 1.0 E-9 to 1.8 E-9 C/kg/hr (4 to 7 μ R/hr) above background. All areas now meet the exposure criteria of less than 2.6 E-9 C/kg/hr (10 μ R/hr) above background. All soil samples taken in the areas of concern, inside and outside the fenced areas, revealed that the highest level of Co-60 in the soil was 0.13 Bq/gram (3.4 pCi/gram), below the subsurface limits of 0.30 Bq/gram (8 pCi/gram).

On April 24, 1996, Region I staff collected split samples and performed confirmatory radiological measurements inside and outside the fenced areas of the site property, and in the vicinity of the various buildings. NRC's measurements averaged between 1.3 E-9 to 2.1 E-9 C/kg/hr (5 to 8 μ R/hr) above background, consistent with the licensee's findings. Soil sample results show that the highest levels in the soil were 0.1 Bq/gram (2.7 pCi/gram) for Co-60 and 0.003 Bq/gram (0.07 pCi/gram) for Cs-137. (The subsurface limit for Cs-137 is 0.56 Bq/gram (15 pCi/gram)).

After review of the soil sample data and the exposure rates of the excavated areas, the staff concludes that the areas of concern at the facility now meet the guidelines for unrestricted release.

RECOMMENDATION:

Based on the results of the remedial actions taken by RTI, Inc., the staff review of the docket files, radiological survey reports, and the results of NRC confirmatory measurements, the staff concludes that decommissioning has been satisfactorily completed in the areas of concern (unrestricted areas) at the RTI, Rockaway, New Jersey site. The staff has placed a notice in the Federal Register (61 FR 36585, dated July 11, 1996) stating that the areas of concern meet NRC guidelines for release for unrestricted use. NRC plans no further actions and intends to remove this site from the SDMP and terminate the license.

In addition, the staff has notified the U.S. Environmental Protection Agency and the State of New Jersey of NRC's intent to remove the site from the SDMP.

It is the staff's intention, unless otherwise directed by the Commission, within ten days from the date of this paper, to send a letter to RTI, Inc., (attachment) stating that the RTI site meets current NRC requirements for

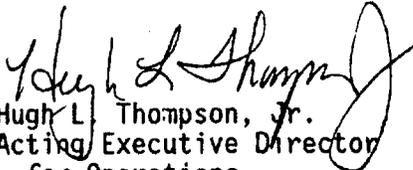
The Commissioners

- 7 -

release for unrestricted use and that NRC intends to remove the site from the SDMP. The license will then be terminated.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.


Hugh L. Thompson, Jr.
Acting Executive Director
for Operations

Attachment:
Draft letter to RTI, Inc.

SECY NOTE: In the absence of instructions to the contrary, SECY will notify the staff on Monday, February 10, 1997 that the Commission, by negative consent, assents to the action proposed in this paper.

DISTRIBUTION:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

DRAFT

Mr. John D. Schlecht
Director of Operations
RTI Incorporated
108 Lake Denmark Road
Rockaway, New Jersey 07866

SUBJECT: REMOVAL OF THE RTI, INC., ROCKAWAY, NEW JERSEY, FACILITY FROM THE
U. S. NUCLEAR REGULATORY COMMISSION SITE DECOMMISSIONING MANAGEMENT
PLAN

Dear Mr. Schlecht:

I am responding to your letter dated June 14, 1996, requesting that the U.S. Nuclear Regulatory Commission release the RTI, Inc., Rockaway, New Jersey, site for unrestricted use and remove the site from the Site Decommissioning Management Plan (SDMP). We have reviewed your reports from the radiological surveys and analysis of soil samples and conducted our own radiological survey. We conclude that all remediated areas at the facility meet the criteria for release for unrestricted use as discussed in the "Action Plan to Ensure Timely Cleanup of Site Decommissioning Management Plan Sites" (the Action Plan) (57 FR 13389-13392) and NRC's current soil contamination criteria.

In accordance with your request, we are removing the RTI, Inc., Rockaway, New Jersey, site from the SDMP list. Further remedial action is not required.

As noted in the Action Plan, this is the Commission's final action on the referenced license. NRC will not require any additional decommissioning in response to future NRC criteria or standards, unless additional contamination, or noncompliance with your Remedial Action Plan submitted to NRC in April 1987, is found, indicating a significant threat to public health and safety.

Thank you for your cooperation in this matter. If you have any questions about our action, please contact Anthony Dimitriadis of my staff at (610) 337-6953 or me at (610) 337-5200. I trust that this reply responds to your request.

Sincerely,

Ronald R. Bellamy, Chief
Decommissioning & Laboratory Branch
Division of Nuclear Materials Safety

License No. 29-13613-02
Docket No. 030-07022

cc: State of New Jersey
EPA, Region II

Attachment

AUG 13 1996

MEMORANDUM TO: Margaret V. Federline, Acting Director
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
Original Signed By:
James H. Joyner

FROM: *for* Charles W. Hehl, Director
Division of Nuclear Materials Safety
Region I

SUBJECT: COMMISSION PAPER TO REMOVE RTI INC., FROM SITE
DECOMMISSIONING MANAGEMENT PLAN

Attached is a Commission Paper proposing to remove RTI, Inc., from the Site Decommissioning Management Plan. RTI has completed remediation at this site, and submitted a final status survey. Our review of the licensee activities and our independent confirmatory surveys indicate that the previously contaminated areas of the site have been remediated to criteria for release for unrestricted use. There are no SDMP issues remaining at this site.

Following Commission approval, we will inform the licensee in writing of our decision.

CONTACT: A. Dimitriadis, DNMS
(610) 337-6953

cc: W. Kane, Region I
M. Weber, NMSS

DOCUMENT NAME: C:\SDMP\FILE.S\RTIMEMO2.CWH

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	DNMS/RI	DNMS/RI	DNMS/RI			
NAME	DNMS/RI	RBellamy	Hehl			
DATE	08/10/96	08/13/96	08/13/96	08/ /96	08/ /96	

OFFICIAL RECORD COPY



108 Lake Denmark Road • Rockaway, NJ 07866
(201) 625-8400 • FAX: (201) 625-7820

Docket No. 030-07022
License No. 29-13613-02
Control No. 114377

June 14, 1996

Mr. Anthony Dimitriadis
Health Physicist
USNRC
Region I
475 Allendale Rd
King of Prussia, PA 19406-1415

Dear Mr. Dimitriadis:

In addition to the request to remove item 6E from USNRC license No. 29-13613-02, RTI Inc. requests that the Rockaway, NJ site be removed from the SDMP list. Data supporting this request were enclosed in our May 23, 1996 submittal, which you have already received. If you need any further information please call me at (201) 625-8400.

Sincerely,

A handwritten signature in black ink, appearing to read 'John D. Schlecht', written over a horizontal line.

John D. Schlecht
Director of Operations

cc: Theo Muller
Duncan White

114377
JUN 17 1996



MS-16
K8

108 Lake Denmark Road • Rockaway, NJ 07866
(201) 625-8400 • FAX: (201) 625-7820

May 23, 1996

Docket No. 030-07022
License No. 29-13613-02
Control No. 114377

Mr. Anthony Dimitriadis
Health Physicist
Decommissioning and Laboratory Branch
USNRC
Region I
475 Allendale Rd
King of Prussia, PA 19406-1415

Dear Mr. Dimitriadis:

This letter is in response to your letter of February 26, 1996. RTI Inc. has completed core sampling and Gamma logging of the previously contaminated areas on the Rockaway property. These areas were remediated by various activities performed between 1987 and 1991. Information regarding these prior remediation activities were previously submitted to the NRC Region I for review.

Enclosed please find a report form Vectre Corporation summarizing the results of the core samples and Gamma logging of the four areas of concern on the Rockaway property. All results indicate that the property is suitable for release to unrestricted use. The highest measured Co-60 concentration was 3.4 pCi/g, which is well below the established criteria of 8.0 pCi/g.

RTI Inc. requests that License No. 29-13613-02 be amended to remove item 6E. A copy of our License amendment is enclosed for your review.

If you need any further information please call me at (201) 625-8400.

Sincerely,

A handwritten signature in black ink, appearing to read 'John D. Schlecht', written over a horizontal line.

John D. Schlecht
Director of Operations

cc: Theo Muller
Duncan White

MAY 24 1996



108 Lake Denmark Road • Rockaway, NJ 07866
(201) 625-8400 • FAX: (201) 625-7820

May 23, 1996

Docket No. 030-07022
License No. 29-13613-02
Control No. 114377

Mr. Duncan White
Senior Health Physicist
USNRC
Region I
475 Allendale Rd
King of Prussia, PA 19406-1415

Dear Mr. White:

RTI Inc. requests the removal of Item 6E from license No. 29-13613-02. Enclosed for your review is our submittal to Mr. Anthony Dimitriadis of USNRC Region I dated May 23, 1996 in support of this amendment.

As you are aware, there is a pending sale of most of RTI's assets to SteriGenics International. This transaction should transpire by the end of July. If Item 6E cannot be removed from the License by the time that this transaction takes place, RTI Inc. requests that Item 6E be separated from License No. 29-13613-02. At that time SteriGenics would be responsible for Items 6A through 6D and a separate license would need to be issued to RTI Inc. for Item 6E.

In the event that a separate license needs to be issued to RTI Inc. for Item 6E, the RSO for the new RTI Inc. license will be John. D. Schlecht. Mr. Schlecht has agreed to be retained as RSO under a consultant arrangement in this event.

Enclosed please find our check for \$780.00 to cover this amendment. If you need any further information please call either myself or Mr. Schlecht at (201) 625-8400.

Sincerely,


Theo Muller
CEO

cc: A. Dimitriadis
J. Schlecht

FEB 26 1996

Docket No. 030-07022
License No. 29-13613-02
Control No. 114377

Mr. John D. Schlecht
Director of Operations
RTI, Incorporated
108 Lake Denmark Road
Rockaway, NJ 07866

Dear Mr. Schlecht:

This is in reference to your letter dated July 7, 1995 and our telephone conversation on February 13, 1996, regarding the remediation of contaminated soil at the Process Technology North Jersey facility in Rockaway, New Jersey.

Based on our conversation, it is my understanding that you intend to support your request to reduce the amount of cobalt-60 contaminated material listed on your license by taking and analyzing a number of core samples in the locations specified below. It is my understanding that will take a minimum of one core sample from Areas A, B, C, and D each, as designated in your letter dated January 3, 1991 to verify that these areas meet the release criteria. It is also my understanding that you will submit your procedures for determining the method of taking the samples, and the location and depth of the samples.

Specifically included in the procedures you will:

- a. Confirm that core samples will go to 8 feet, or to a safe distance above the water table, whichever is shorter.
- b. Confirm that soil from core samples will be analyzed in segments to determine the concentration of cobalt-60 at various depths.
- c. Confirm that you will perform gamma logging of each borehole, and on-site screening of soil samples to identify the maximum radiation level from each core sample.
- d. Confirm that you will determine the cobalt-60 concentration of the segment having the maximum radiation level reading for each borehole; and of any sample which exceeds a predetermined trigger level during onsite screening.
- e. Describe the instrumentation to be used for radiation level measurements, gamma-logging of boreholes, and onsite screening of core samples; the equipment to be used for obtaining core samples; the methods to be used to determine the cobalt-60 content of the samples, including any sample preparation method used; and the method used to identify and track samples to be analyzed (chain-of-custody procedures).

RTI, Incorporated
John D. Schlecht

-2-

- f. Describe the records which will be maintained, including the location, depth, and material type of each borehole; radiation level measurements made during gamma-logging of boreholes and onsite screening of samples; analyses of samples; calibration of instruments and daily instrument performance checks.
- g. You will notify the NRC of the schedule for taking core samples so that an NRC representative may be present on site to observe the sampling and to collect split samples for analysis.

Furthermore, it is my understanding that all of this will be performed by May 1, 1996. Thank you for your cooperation in this matter. If any of my understandings are incorrect, or if you have any questions, please do not hesitate to contact me at (610) 337-6953.

Sincerely,

Original Signed By:

Anthony Dimitriadis

Anthony Dimitriadis

Health Physicist

Decommissioning and Laboratory
Branch

TYPE VISIT CONFERENCE TELEPHONE INCOMING OUTGOING

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU	ORGANIZATION (Office, dept., bureau, etc.)	TELEPHONE NO.	ROUTING	
			NAME/SYMBOL	IN
John Schlecht	RTI, Inc.			
SUBJECT				
Core samples to be done on property.				

SUMMARY John and I discussed the issues of core sampling the areas where items were ~~discovered~~ discovered in the northeast end of the property.

We went through the list of the ~~July~~ June, 1995 WRC letter, item 1.

We agreed that it is reasonable to get at least one sample from each of the areas in a manner outlined in the deficiency letter dated June 7, 1993.

ACTION REQUIRED

Get response back w/ items outlined

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
DIMITRIADIS		2/26/96

ACTION TAKEN

SIGNATURE	TITLE	DATE

114377

JUN - 7 1995

License No. 030-07022
Docket No. 29-13613-02
Control No. 114377

Mr. John D. Schlecht
Radiation Safety Officer
RTI, Incorporated
108 Lake Denmark Road
Rockaway, NJ 07866

Dear Mr. Schlecht:

This refers to your letters dated June 3, 1993, July 8, 1991, October 15, 1992, January 4, 1993 and May 25, 1993 regarding the remediation of contaminated soil at the Process Technology North Jersey facility in Rockaway, New Jersey. We have reviewed the information submitted in these letters, as well as information submitted in the past, to support your request to reduce the amount of cobalt-60 contaminated material listed on your license.

We understand that soil contamination on this site was caused by 1.) the burial of radioactive material on the site, and 2.) the release of contaminated water from the washing of resins, etc. We understand that buried material was only found at a location identified on two hand-drawn maps of the northeast corner of the fenced property and that no additional records of these or other burials are known to exist. We further understand the buried material was recovered from only one of the trenches dug in the northeast corner and that radiological surveys of the trenches were performed. Please specifically confirm our understandings in your response to this letter.

In order to continue our review of your request, we need the following additional information:

1. We understand that the criteria used for remediation of the locations you designated as Areas A, B, C, and D were based on Regulatory Guide 1.109, NUREG-3332, and the MICROSHIELD computer code. These were used to determine radiation levels which could be measured with a microR meter and which were representative of the given release criteria of 8 picocuries of cobalt-60 per gram (pCi/g) of soil in unrestricted areas, and 15 pCi/g inside the fence. However, only one core sample was performed in one of the remediated areas and no soil samples were analyzed during remediation activities of Areas A, B, C, and D, to verify the adequacy of microR measurements. Confirm that you will take core samples from Areas A, B, C, and D, as designated in your letter dated January 3, 1991 to verify that these areas meet the release criteria. Submit your procedures for determining the number of samples

SECTION COPY

to be taken, the method of taking the samples, and the location and depth of the samples.

In these procedures;

- a. Confirm that core samples will go to 8 feet, or to a safe distance above the water table, whichever is shorter.
 - b. Confirm that soil from core samples will be analyzed in segments to determine the concentration of cobalt-60 at various depths.
 - c. Confirm that you will perform gamma logging of each borehole, and on-site screening of soil samples to identify the maximum radiation level from each core sample.
 - d. Confirm that you will determine the cobalt-60 concentration of the segment having the maximum radiation level reading for each borehole; and of any sample which exceeds a predetermined trigger level during onsite screening.
 - e. Describe the instrumentation to be used for radiation level measurements, gamma-logging of boreholes, and onsite screening of core samples; the equipment to be used for obtaining core samples; the methods to be used to determine the cobalt-60 content of the samples, including any sample preparation method used; and the method used to identify and track samples to be analyzed (chain-of-custody procedures).
 - f. Describe the records which will be maintained, including the location, depth, and material type of each borehole; radiation level measurements made during gamma-logging of boreholes and onsite screening of samples; analyses of samples; calibration of instruments and daily instrument performance checks.
 - g. Confirm that you will notify the NRC of the schedule for taking core samples so that an NRC representative may be present on site to observe the sampling and to collect split samples for analysis.
2. In your letter dated January 4, 1993, you agreed to sample wells 15S and 4S each quarter for two years to determine if cobalt-60 is migrating in ground water to Lake Denmark. Since that time, we have received one report that the first samples were collected in April 1993 and that no cobalt-60 was detected in those samples.

Submit the following information:

- a. A description of the sampling method, the amount of water collected, and any sample preservation procedures.

RTI, Incorporated
John D. Schlecht

-3-

- b. A description of the method of analysis used by you and/or other laboratories which provided analyses. Specify the instrumentation used, and the lower limit of detection for cobalt-60 in water samples.
 - c. The sample results for each quarter to date.
 - d. A map showing the locations of the sampled wells.
3. Attached are two maps showing locations excavated in 1987 during the search for buried materials and the areas remediated in 1990. However, the designations of the excavated areas are not consistent between the two maps, one submitted to the NRC as Attachment B to your letter dated July 8, 1991, and the other from our inspection report dated May 21, 1987. From discussions with your staff and review of other information, we understand that the 1987 map correctly shows 7 excavations in the northeast corner of the property, and that the Excavation A, B, C, and D on the 1987 map correspond to Pits 1, 2, 3, and 4 on the 1991 map, and that the locations shown on the 1987 map are probably more accurate. We also understand from our review of documents that buried material was found only in Pit #1 also known as Excavation "A". Please confirm our understandings in your reply to this letter.
- a. Excavation E on the 1987 map does not correspond to Pit #5 on the 1991 map. Provide the correct location of this excavation.
 - b. Confirm that the areas remediated in 1990 known as Area A and Area B in the letter dated January 3, 1991, refer to contaminated soil remaining in the northeast corner of the property after the 1987 excavations were completed and backfilled, and that Areas A and B as designated in 1990 do not correspond to specific pits or excavations as shown on the 1987 and July 1991 maps.

Thank you for your cooperation in this matter. Please respond with the requested information within thirty days of the date of this letter and refer to Control No. 114377. If you have any questions, please contact Anthony Dimitriadis of my staff, at (610) 337-6953, or me at (610) 337-5252.

Sincerely,

Original Signed By:

John D. Kinneman, Chief
Site Decommissioning Management
Plan Task Force
Division of Radiation Safety
and Safeguards

RTI, Incorporated
John D. Schlecht

-4-

Enclosures:

1. Map 1 (Attachment B to RTI letter dated July 8, 1991)
2. Map 2 (Attachment to NRC inspection report dated May 21, 1987)



108 Lake Denmark Road • Rockaway, NJ 07866
(201) 625-8400 • FAX (201) 625-7820

MS 16

K-8

July 7, 1995

License No. 030-07022
District No. 29-13613-02
Control No. 114377

Mr. John D. Kinneman, Chief
Site Decommissioning Management
Plan Task Force
Division of Radiation Safety
and Safeguards

Dear Mr. Kinneman:

In response to your letter of June 7, 1995, we would like to respond to each specific point. We will respond to items 2 and 3 first and then to item 1.

ITEM 2:

- a. The sampling method was in accordance with the NJDEPE Field Sampling Procedure Manual. A description of the method is given in the enclosed letter dated 6-25-93 from Vectre Corporation.
- b. The radioactivity analysis was performed with a SCA utilizing a NAI detector. 100ml samples were assayed for radioactivity. The MDA and efficiency for the geometry were determined using a NIST traceable test source of the same geometry. The MDA for each test is documented on the enclosed sample results.
- c. The sample results for each quarter are enclosed. None indicated the presence of Co-60 in excess of the MDA (<2pCi/ml).
- d. A map showing the location of the wells was submitted with our 10-15-92 letter. It is enclosed.

ITEM 3:

- a. The location of Excavation E (PiT 5) is correct on the 1987 map. The 1991 map is incorrect.
- b. Areas A and B remediated in 1990, are in the same general area as pits A through D on the 1987 map. They do not, however, correspond to specific pits. Area A and B, which were remediated in 1990, refer to contaminated soil.

114377

JUL 10 1995

REC'D IN LAS

ITEM 1:

It was agreed during the meeting on May 24, 1995 between Mr. Paul Shapiro of RTI Inc. and NRC representatives Betsy Ulrich and Anthony Dimitriadis that some additional core samples would be taken. Core samples will be taken at appropriate areas after we have discussed this matter more thoroughly with the NRC. It was, however, our understanding through previous submittals that the survey method for determining soil activity levels was accepted. This method is explained in our January 3, 1991, June 3, 1991 and July 8, 1991 submittals. Our January 3, 1991 and July 16, 1990 submittals committed to taking a core sample in area A. This core was taken and the results were submitted with the January 3, 1991 letter.

RTI Inc. is concerned that extensive core sampling may not yield an appropriate characterization of the site. We had understood previously that the characterization method we had described in our prior submittals was generally acceptable.

RTI Inc. wishes to cooperate fully with the NRC in this matter. We request an additional meeting, at Region I Headquarters, to further discuss the details of this issue.

Please call at your convenience to discuss this. Thank you.

Sincerely,



John D. Schlecht
Director of Operations
for Mr. Steve Zimmerman
Acting Radiation Safety Officer

cc: Theo Muller

Enc.



VECTRE™
CORPORATION

"Environmental Integrity with Efficiency"

P.O. Box 930
Lafayette, New Jersey 07848-0930
(201) 383-2500
Fax: (201) 579-0025

June 25, 1993
Proposal # 93-223

Paul Shapiro
Vice President
RTI, Inc.
108 Lake Denmark Road
Rockaway, New Jersey 07866

Dear Mr. Shapiro:

As per our conversation, Vectre is pleased to provide this letter/proposal to conduct groundwater sampling for monitoring wells MW-4s and MW-15s on your site. The scope of work for this activity is as follows.

Vectre will collect groundwater samples in accordance with the NJDEPE Field Sampling Procedures Manual. Samples will be collected with dedicated equipment and a minimum of three well volumes will be purged from each well prior to sample collection. A submersible pump will be used to evacuate the wells.

Dedicated pre-packaged and decontaminated polyethylene disposable bailers will be used to collect the samples.

Immediately following sample collection, samples will be properly preserved by adding HCl to the samples until a pH of 2 is attained. The samples will be submitted to RTI, Inc. for radioactivity analysis.

Vectre's cost for providing the above service is normally \$ 550. Because Vectre staff will be on site Monday through Wednesday, June 28-30 1993, for another project, we can offer you a reduced cost of \$ 450. Terms and conditions for this proposal are the same as those associated with Vectre proposal 92-413R (RTI Work Plan Implementation/Remedial Actions). Please indicate your approval for this proposal by signing below. If you have any questions, please do not hesitate to call me. Thank you.

Sincerely,

Jerry L. Haug
Project Manager

Approval of Vectre proposal # 93-223 for \$ 450.

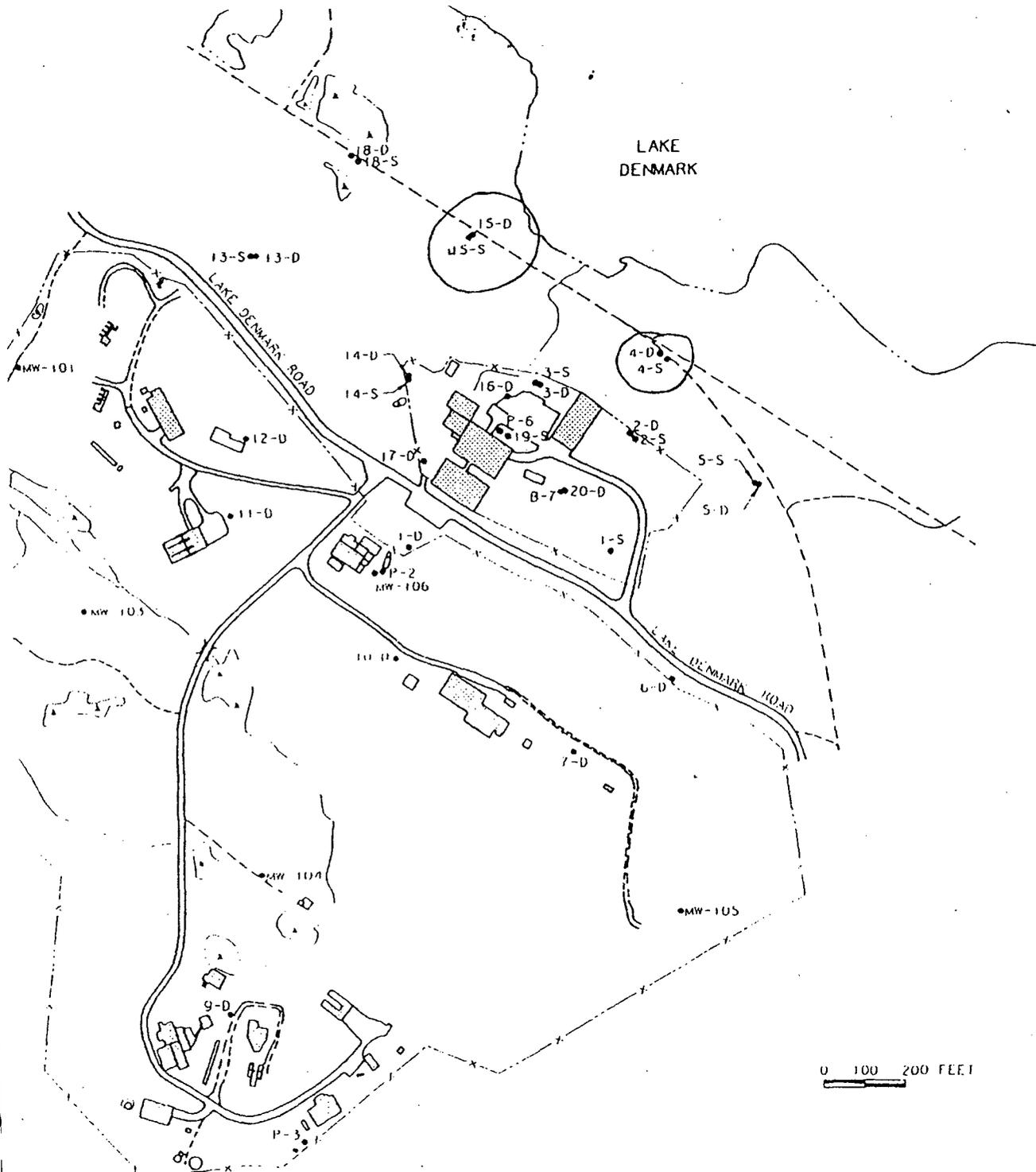
Paul O. Kharin
RTI, Inc.

0 7 1 93
Date

JLH/jh

cc: Debbie Riale, Vectre
Dale Albright, Vectre





- LEGEND**
- UNPAVED ROAD OR FENCE
 - x- FENCE
 - - - - - STREAM/WATER BOUNDARY
 - [shaded box] BUILDING
 - MONITORING WELL
 - (A A) POND OR SHALLOW SURFACE WATER BODY

RADIATION TECHNOLOGY INC. RI-115
 GROUND WATER MONITORING
 WELL LOCATIONS

0 100 200 FEET



Process Technology (NoJ)
Radiation Activity Report - LIQUID/SLUDGE

Date :04/07/93
Purpose :Well samples

=====
Count time for Background : 10 minutes
Count time for Source & Samples : 10 minutes
Background Count : 1804 Background cpm: 180.4 cpm
=====

Calibration Source Information

LIQUID SOURCE ID#:S9023051-001
Radionuclide :Cobalt 60
Calibration Date :05/10/90 Time elapsed: 1063 days
Initial Activity : 0.0898 uCi = 197580 dpm
Today's Activity : 0.0612 uCi = 134640 dpm
Source Count : 121644
Net Source cpm : 11984 cpm = 5992 dpm
=====

Counter Scaler Information

Model # :1000 Scaler
Serial # :24764
Efficiency :0.044503
MDA (in pCi/ml) : 2.02 pCi/ml =0.000000 uCi/ml
=====

NUMBER OF SAMPLES TO COUNT: 3 (1 - 21)

NOTE: 1 pCi = 1 x 10⁻⁶ uCi

	Sample I.D.	Gross Counts	Net dpm	Activity (pCi/ml)	Temp (C)	PH
1	RTI-4S	1890	4	0.44	NA	NA
2	RTI-15S	1871	3	0.34	NA	NA

Note: Activity above 5 pCi/ml requires RSO notification. *** =
Activity above the MDA, RSO notified.

Completed By: Janet R. Smith, RA

Date 4/12/93

Reviewed By: [Signature] RSO

Date 4/12/93

Process Technology (NoJ)
Radiation Activity Report - LIQUID/SLUDGE

Date :07/02/93
Purpose :Well Samples

=====
Count time for Background : 10 minutes
Count time for Source & Samples : 10 minutes
Background Count : 318 Background cpm: 31.8 cpm
=====

Calibration Source Information

LIQUID SOURCE ID#:NES 9023
Radionuclide :Cobalt 60
Calibration Date :04/24/87 Time elapsed: 2262 days
Initial Activity : 0.0900 uCi = 198000 dpm
Today's Activity : 0.0398 uCi = 87560 dpm
Source Count : 25079
Net Source cpm : 2476 cpm = 1238 dpm
=====

Counter Scaler Information

Model # :2200 Scaler
Serial # :47157
Efficiency :0.014139
MDA (in pCi/ml) : 2.67 pCi/ml =0.000001 uCi/ml
=====

NUMBER OF SAMPLES TO COUNT: 2 (1 - 21)

NOTE: 1 pCi = 1 x 10⁻⁶ uCi

	Sample I.D.	Gross Counts	Net dpm	Activity (pCi/ml)	Temp (C)	PH
1	RTI MW 4S	327	0	0.14		
2	RTI MW 15S	279	0	0.00		

Note: Activity above 5 pCi/ml requires RSO notification. *** =
Activity above the MDA. Recount Samples using a longer
counting time and notify RSO.

Completed By: Hand D Smith, QA

Date 7/2/93

Reviewed By: [Signature] RSO

Date 7/2/93

Process Technology (NoJ)
Radiation Activity Report - LIQUID/SLUDGE

Date :09/29/93
Purpose :WELL SAMPLES - TAKEN 9/28/93

```

=====
Count time for Background      :      10 minutes
Count time for Source & Samples :      10 minutes
Background Count :      5892      Background cpm:      589.2 cpm
=====
  
```

Calibration Source Information

```

LIQUID SOURCE ID#:NES 9023
  Radionuclide :Cobalt 60
Calibration Date :04/24/87      Time elapsed:      2351 days
Initial Activity : 0.0900 uCi      =      198000 dpm
Today's Activity : 0.0386 uCi      =      84920 dpm
Source Count :      141037
Net Source cpm :      13515 cpm      =      6757 dpm
=====
  
```

Counter Scaler Information

```

Model # :2200 Scaler
Serial # :47157
Efficiency :0.079572
MDA (in pCi/ml) :      2.04 pCi/ml = 2.0E-06 uCi/ml
=====
  
```

NUMBER OF SAMPLES TO COUNT: 2 (1 - 22)
NOTE: 1 pCi = 1 x 10⁻⁶ uCi

	Sample I.D.	Gross Counts	Net dpm	Activity (pCi/ml)	Temp (C)	PH
1	RTI MW 15S	6541	32	1.85	NA	NA
2	RTI MW 4S	5862	0	0.00		

Note: Activity above 3 pCi/ml requires RSO notification. *** = Samples requiring RSO notification.

Completed By: *Handy A. Smith, QA*

Date *9/29/93*

Reviewed By: *[Signature] RSO*

Date *10/1/93*

Process Technology (NoJ)
Radiation Activity Report - LIQUID/SLUDGE

Date : 01/14/94
Purpose : SAMPLES: MW-15S & MW-4S

=====
Count time for Background : 10 minutes
Count time for Source & Samples : 10 minutes
Background Count : 5716 Background cpm: 571.6 cpm
=====

Calibration Source Information

LIQUID SOURCE ID#: NES 9023
Radionuclide : Cobalt 60
Calibration Date : 04/24/87 Time elapsed: 2458 days
Initial Activity : 0.0900 uCi = 198000 dpm
Today's Activity : 0.0371 uCi = 81620 dpm
Source Count : 137842
Net Source cpm : 13213 cpm = 6606 dpm
=====

Counter Scaler Information

Model # : 2200 Scaler
Serial # : 47157
Efficiency : 0.080939
MDA (in pCi/ml) : 1.98 pCi/ml = 0.000002 uCi/ml
=====

NUMBER OF SAMPLES TO COUNT: 2 (1 - 22)
NOTE: 1 pCi = 1 x 10⁻⁶ uCi

	Sample I.D.	Gross Counts	Net dpm	Activity (pCi/ml)	Temp (C)	PH
1	MW-15S	6144	21	1.20	N/A	N/A
2	MW-4S	6437	36	2.02	N/A	N/A

Note: Activity above 3 pCi/ml requires RSO notification. *** = Samples requiring RSO notification.

Completed By: *Ante W. Butcher*

Date 1/14/94

Reviewed By: *Harold A. Smith, QA*
RSO

Date 1/20/94
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1/20/94

Process Technology (NoJ)
Radiation Activity Report - LIQUID/SLUDGE

Date : 05/11/94
Purpose : 4S & 15S WELL SAMPLES

```
=====
Count time for Background      :      10 minutes
Count time for Source & Samples :      10 minutes
Background Count :      5664      Background cpm:      566.4 cpm
=====
```

Calibration Source Information

```
LIQUID SOURCE ID#: NES 9023
Radionuclide : Cobalt 60
Calibration Date : 04/24/87      Time elapsed:      2575 days
Initial Activity : 0.0900 uCi      = 198000 dpm
Today's Activity : 0.0356 uCi      = 78320 dpm
Source Count : 132649
Net Source cpm : 12699 cpm      = 6349 dpm
=====
```

Counter Scaler Information

```
Model # : 2200 Scaler
Serial # : 47157
Efficiency : 0.081068
MDA (in pCi/ml) : 1.96 pCi/ml = 0.000002 uCi/ml
=====
```

NUMBER OF SAMPLES TO COUNT: 2 (1 - 22)

NOTE: 1 pCi = 1 x 10⁻⁶ uCi

Sample I.D.	Gross Counts	Net dpm	Activity (pCi/ml)	Temp (C)	PH
1 4S SAMPLE	5896	12	0.65	N/A	N/A
2 15S SAMPLE	5815	8	0.42	N/A	N/A

Note: Activity above 3 pCi/ml requires RSO notification. *** =
Samples requiring RSO notification.

Completed By: Arthur W. Bents, Jr.

Date 5/11/94

Reviewed By: [Signature]

Date 5/11/94

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Process Technology (NoJ)
Radiation Activity Report - LIQUID/SLUDGE

Date : 07/13/94
Purpose : MW45 & MW15s, SAMPLES

```
=====
Count time for Background      :      10 minutes
Count time for Source & Samples :      10 minutes
Background Count :      5722   Background cpm:   572.2 cpm
=====
```

Calibration Source Information

```
LIQUID SOURCE ID#: NES 9023
Radionuclide : Cobalt 60
Calibration Date : 04/24/87   Time elapsed:   2638 days
Initial Activity : 0.0900 uCi   = 198000 dpm
Today's Activity : 0.0348 uCi   = 76560 dpm
Source Count    : 130532
Net Source cpm  : 12481 cpm    = 6241 dpm
=====
```

Counter Scaler Information

```
Model # : 2200 Scaler
Serial # : 47157
Efficiency : 0.081511
MDA (in pCi/ml) : 1.96 pCi/ml = 0.000002 uCi/ml
=====
```

NUMBER OF SAMPLES TO COUNT: 2 (1 - 22)

NOTE: 1 pCi = 1 x 10⁻⁶ uCi

	Sample I.D.	Gross Counts	Net dpm	Activity (pCi/ml)	Temp (C)	PH
1	MW45	5700	0	0.00	N/A	N/A
2	MW15s	5858	7	0.38	N/A	N/A

Note: Activity above 3 pCi/ml requires RSO notification. *** = Samples requiring RSO notification.

Completed By: *Ante W. Burt*

Date 7/13/94

Reviewed By: *[Signature]* RSO

Date 7/19/94

Process Technology (NoJ)
Radiation Activity Report - LIQUID/SLUDGE

Date : 10/07/94
Purpose : WELL SAMPLES

=====
Count time for Background : 10 minutes
Count time for Source & Samples : 10 minutes
Background Count : 5404 Background cpm: 540.4 cpm
=====

Calibration Source Information

LIQUID SOURCE ID#: NES 9023
Radionuclide : Cobalt 60
Calibration Date : 04/24/87 Time elapsed: 2724 days
Initial Activity : 0.0900 uCi = 198000 dpm
Today's Activity : 0.0337 uCi = 74140 dpm
Source Count : 125830
Net Source cpm : 12043 cpm = 6021 dpm
=====

Counter Scaler Information

Model # : 2200 Scaler
Serial # : 47157
Efficiency : 0.081215
MDA (in pCi/ml) : 1.91 pCi/ml = 0.000002 uCi/ml
=====

NUMBER OF SAMPLES TO COUNT: 2 (1 - 22)

NOTE: 1 pCi = 1 x 10⁻⁶ uCi

	Sample I.D.	Gross Counts	Net dpm	Activity (pCi/ml)	Temp (C)	PH
1	MS 4S (9/30/94)	5850	22	1.25	NA	NA
2	MS 1S (9/30/94)	5469	3	0.18	NA	NA

Note: Activity above 3 pCi/ml requires RSO notification. *** = Samples requiring RSO notification.

Completed By: Karel A. Smith, QA

Date 10/7/94

Reviewed By: [Signature] RSO

Date 10/7/94

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Process Technology (NoJ)
Radiation Activity Report - LIQUID/SLUDGE

Date : 02/07/95
Purpose : WELL SAMPLES 4S AND 15S (Taken 1/30/95) RAL

=====
Count time for Background : 10 minutes
Count time for Source & Samples : 10 minutes
Background Count : 5592 Background cpm: 559.2 cpm
=====

Calibration Source Information

LIQUID SOURCE ID#: NES 9023
Radionuclide : Cobalt 60
Calibration Date : 04/24/87 Time elapsed: 2847 days
Initial Activity : 0.0900 uCi = 198000 dpm
Today's Activity : 0.0322 uCi = 70840 dpm
Source Count : 114177
Net Source cpm : 10859 cpm = 5429 dpm
=====

Counter Scaler Information

Model # : 2200 Scaler
Serial # : 47157
Efficiency : 0.076641
MDA (in pCi/ml) : 2.06 pCi/ml = 0.000002 uCi/ml
=====

NUMBER OF SAMPLES TO COUNT: 0 (1 - 22)

NOTE: 1 pCi = 1 x 10⁻⁶ uCi

Sample I.D.	Gross Counts	Net dpm	Activity (pCi/ml)	Temp (C)	PH
4S	5643	3	0.15	N/A	N/A
15S	5623	2	0.09	N/A	N/A

Note: Activity above 3 pCi/ml requires RSO notification. *** = Samples requiring RSO notification.

Completed By: David L. Smith, RAL
Reviewed By: P.O. Shapiro VP/Corp RSO

Date 2/2/95
Date 2/7/95
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

MS 20

Q-5

OCT 13 1993

29-13613-02

MEMORANDUM FOR: Ronald R. Bellamy, Chief
Nuclear Materials Safety Branch
Division of Radiation Safety
and Safeguards, RI

FROM: John E. Glenn, Chief
Medical, Academic, and Commercial
Use Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

SUBJECT: TECHNICAL ASSISTANCE REQUEST: RTI, INCORPORATED (PROCESS
TECHNOLOGY) - CONTROL NO. 114377

This is in response to your memorandum, dated March 24, 1993 (Enclosure 1), requesting assistance on review of the draft deficiency letter on the characterization and remediation activities at the Process Technology site in Rockaway, New Jersey. We agree with your draft deficiency letter that additional information is needed from the licensee, but disagree with the number of subsurface core soil samples that are needed in order to verify that the site is suitable for release for unrestricted use. This is because improved geophysical survey techniques (discussed below) may be used in lieu of certain subsurface core soil samples.

The cause of the known and potential contamination was by: 1) burial of material on the site pursuant to 10 CFR 20.304, removed by the Commission effective January 28, 1981 (45 FR 71762, October 30, 1980); and 2) release of contaminated water to the ground from the washing of resins, etc. Developing an adequate subsurface sampling plan, which may include core soil samples, is dependent on site-specific information, the licensee's operating history, and available records required by the NRC pursuant to 10 CFR 20.304 burials. Therefore, the scope of the subsurface sampling plan will need to be determined on a case specific basis.

1. Subsurface Soil Samples to Locate 10 CFR 20.304 Burials

We agree with your staff's conclusion that the magnetometry scan performed in 1987 cannot be used as a sole basis for stating that no burial sites exist other than in the northeast corner of the property. This is because the scan covered only that small portion of the property. Pursuant to 10 CFR 20.401, licensees are required to keep records of 10 CFR 20.304 burials until the Commission authorizes their disposition. If Process Technology cannot obtain

114377

OCT 18 1993

OCT 13 1993

complete records of all 10 CFR 20.304 burials, then Process Technology must perform a complete geophysical survey of its site to demonstrate that the subsurface meets the definition of unaffected area as defined in NUREG/CR-5849, Section 4.2.1.¹ (Enclosure 2). Process Technology can use previous geophysical surveys, excavations, core soil samples, or other technical findings (e.g., presence of existing building at the time of burial) to minimize the scope of any proposed geophysical survey, if these technical findings, in the judgment of the staff, have ruled out possible burials at those specific areas. If the proposed geophysical survey by the licensee is approved by the staff and reveals affected areas as defined in NUREG/CR-5849, Section 4.2.1, core soil samples need to be obtained and analyzed in accordance to the soil sampling plan discussed for open land surveys of affected areas under Section 4.2.3 of NUREG/CR-5849. Note that core soil samples must be taken a least a minimum of 8 feet below the surface or a safe distance above the water table, as authorized by the State of New Jersey, whichever is less.

2. Subsurface Soil Samples to Detect Downward Migration of Surface Radioactive Contaminations

We also agree with your staff's concern that the surface contamination originally measured by the licensee could migrate downward. Radiation level surveys performed with the microR meter at the surface cannot be used to identify contaminated materials as much as 6-8 feet below the surface. Therefore, several representative core soil samples, at locations where the highest surface contamination levels were measured, and where excavations of the soil beneath the surface had not been conducted, should be done to rule out this potential pathway. If these soil samples show subsurface contamination, the licensee will need to have a more detailed survey plan. The 8 pCi per gram limit for cobalt-60 is based on the direct exposure pathway. Therefore, because residential facilities could later be built in areas where the surface soil cover has been excavated, any subsurface soil contamination above 8 pCi per gram needs to be identified and remediated.

3. Sampling Plans for Possible Contaminated Water and Sediment from Lake Denmark

The "Review of the NJDEP Phase I Remedial Investigation Report (PD-6)" submitted in the Technical Assistance Request (TAR) package appears to contain sufficient information to describe the groundwater flow and the hydrogeology of the site. However, we agree with your staff's conclusion that there is no information on the presence (or absence) of cobalt-60 in the groundwater between the known burial or spill areas and Lake Denmark. Therefore, we agree that a plan needs to be submitted for sampling the existing wells (see Section I of Enclosure 2) for gross beta and/or cobalt-60. Additionally, if there are no wells between the known burial and spill areas and Lake Denmark (and there

¹ See enclosed document entitled, "Geophysical Techniques for Sensing Buried Wastes and Waste Migration," published by National Ground Water Association, and funded by the U.S. Environmental Protection Agency.

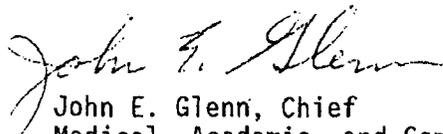
Ronald R. Bellamy

- 3 -

OCT 13 1993

appears not to be from the information submitted), the licensee should submit a plan for installing wells so that NRC can be assured that any groundwater contamination has been characterized and is within the current EPA proposed limit of 218 pCi per liter for cobalt-60.

We have coordinated this reply with the Office of the General Counsel, which has no legal objection. The contact persons for this TAR are Jack Parrott of the Division of Low-Level Waste Management and Decommissioning at (301) 504-2565, and Joseph Wang of the Division of Industrial and Medical Nuclear Safety at (301) 504-2611.



John E. Glenn, Chief
Medical, Academic, and Commercial
Use Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

Enclosures:

1. Memo fm R. Bellamy
to J. Glenn, dtd 3/24/93
2. Geophysical Techniques



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

MAR 24 1993

Docket No. 030-07022
License No. 29-13613-02
Control No. 114377

MEMORANDUM TO: John E. Glenn, Chief
Medical and Commercial Use Safety Branch
Division of Industrial and Medical Nuclear Safety, NMSS

FROM: Ronald R. Bellamy, Chief
Nuclear Materials Safety Branch
Division of Radiation Safety
and Safeguards, RI

SUBJECT: Technical Assistance Request:
RTI, Incorporated (Process Technology)
Reduction of Limits for Contaminated
Soil On Site

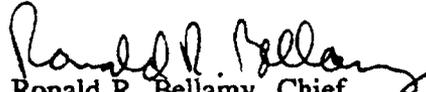
RTI, Incorporated (formerly Process Technology) submitted a request in a letter dated January 3, 1991 to amend License No. 29-13613-02 to reduce the limits for possession of cobalt-60 in contaminated soil on their property. The licensee submitted information regarding the results of remediation activities in letters dated June 3, 1991; July 8, 1991; October 15, 1992; and January 4, 1993. Copies of these letters are enclosed. Information regarding past surveys to identify soil contamination and burial of materials on the site is found in their letters dated April 3, 1987; May 12, 1987; June 12, 1987; August 3, 1987; September 17, 1987; December 14, 1988; March 20, 1989; May 1, 1989; July 6, 1989; July 16, 1990; and August 30, 1990 and in the Oak Ridge Associated Universities Report "Radiological Survey, Radiation Technology Incorporated (Unrestricted Area), Rockaway, New Jersey" dated August 1987. These letters are included in the docket file and are in NuDocs.

We request assistance in determining the information necessary to form an adequate basis to release the site for unrestricted use and/or reduce the possession limits. We have issued deficiency letters dated May 2, 1991 (responses June 3, 1991 and July 8, 1991) and September 11, 1992 (responses October 15, 1992 and January 4, 1993) which request clarification of items submitted. However, the licensee's efforts were never well organized or planned and very little soil or water sampling was performed on the site. We have drafted an additional deficiency letter requesting that systematic biased and unbiased sampling of the site be performed and that information regarding the hydrogeology and groundwater be

Memorandum
John E. Glenn

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submitted. A sampling plan of the scope requested in our draft letter requires a large expenditure of time and money, and we do not want to require such an expenditure if it is not appropriate. Please provide comments on our approach. This is an SDMP site.


Ronald R. Bellamy, Chief
Nuclear Materials Safety Branch
Division of Radiation Safety
and Safeguards

Enclosures:

1. RTI letter dated January 4, 1993
2. RTI letter dated October 15, 1992
3. NRC letter dated September 11, 1992
4. RTI letter dated July 8, 1991
5. RTI letter dated June 3, 1991
6. NRC letter dated May 2, 1991
7. RTI letter dated January 3, 1991



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

DRAFT DEFICIENCY

Docket No. 030-07022
License No. 29-13613-02
Control No. 114377

RTI, Incorporated
ATTN: John D. Schlecht
Radiation Safety Officer
108 Lake Denmark Road
Rockaway, New Jersey 07866

Dear Mr. Schlecht:

Subject: Remediation Activities

This refers to your letters dated June 3, 1991, July 8, 1991, October 15, 1992, and January 4, 1993 regarding the remediation of contaminated soil at the Process Technology North Jersey facility in Rockaway, New Jersey. We have reviewed the information submitted in these letters, as well as information submitted in the past, to support your request to reduce the amount of cobalt-60 contaminated material listed on your license.

We understand that contamination of soil on this site was caused by 1.) burial of material on the site, and 2.) release of contaminated water from the washing of resins, etc. We understand that buried material was only identified on two hand-drawn maps of the northeast corner of the fenced property. No additional records of these or other burials are known to exist. We further understand that buried material was recovered from a series of trenches dug in the northeast corner, and surveys of the trenches were performed. Based on our review of all these facts and all the information available to us, the following conclusions seem appropriate.

The criteria used for remediation of the locations you have designated as Areas A, B, C, and D was based on Regulatory Guide 1.109, NUREG-3332, and the MICROSHIELD computer code. These were used to determine radiation levels which could be measured with a microR meter and were representative of the given release criteria of 8 picocuries of cobalt-60 per gram (pCi/g) of soil in unrestricted areas, and 15 pCi/g inside the fence. However, these documents assume that measured radiation levels are due to surface contamination migrating downward. Therefore, the radiation level surveys performed with the microR meter at the surface cannot be used to identify contaminated materials buried as much as six to eight feet below the surface and cannot be used as the basis for stating that no burial sites exist other than those remediated in the northeast corner.

The magnetometry scan performed in 1987 also cannot be used as a basis for stating that no burial sites exist other than in the northeast corner because it covered only a small portion of the fenced area, and did not include areas closer to the warehouse, west of the buildings, or outside of the fenced area. It is our understanding that no other surveys or samplings were performed to determine if radioactive material is buried in any other areas within the fenced site (or on any other areas of your property) and that only one core sample was performed in one of the remediated areas. In addition, no soil samples were analyzed during remediation activities to verify the adequacy of microR measurements. Therefore, there is little information which indicates that there is no radioactive material buried in these areas.

In order to continue our review, we request the following additional information:

1. Develop and submit a plan for performing core soil samples at your facility. The sampling plan should be in accordance with standard procedures for identification of contamination in the environment, such as NUREG/CR-2082, "Monitoring for Compliance with Decommissioning Termination Survey Criteria" (June 1981); "Survey Procedures Manual for the ORAU Radiological Site Assessment Program," Oak Ridge Associated Universities (May 1987); the U. S. Department of Energy "Environmental Survey Manual" (August 1987) or NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination" (Draft, June 1992). Provide the basis for the selection of a particular method of obtaining samples, the number of samples, the locations and depths of samples, and the type of analyses to be performed. The minimum plan should include:
 - a. Unbiased soil borehole samples selected from regular intervals of the entire area inside the five acre fenced area, regardless of the known or potential contamination. Based on an acceptable grid size of 30 meters by 30 meters (or 100 feet by 100 feet) for selection of unbiased areas, a minimum of 15 core samples would be expected from the unpaved areas inside the five acre area.
 - b. Biased core samples selected from the northeast corner of the site; the area behind Building 62, leading to Area C outside the fence; and the area west and south of Building 61, including Area D and the leach field. Based on an acceptable grid size of 10 meters by 10 meters (or 30 feet by 30 feet) for selection of biased samples, a minimum of 25 samples should be collected from these areas.
 - c. Biased core samples to determine the depth of soil contamination in Areas A, B, C, and D.

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what
is it?

- d. Gamma logging of bore holes, and on-site screening of soil samples to identify the maximum radiation level from each core sample.
 - e. Analysis of the cobalt-60 concentration of the sample having the maximum radiation level reading for a given borehole; and analysis of any sample which exceeds a predetermined trigger level during onsite screening.
 - f. A description of the instrumentation to be used for radiation level measurements, gamma-logging of boreholes, and onsite screening of soil samples; a description of the equipment to be used for drilling core soil samples; a description of the methods used to determine the cobalt-60 content of the soil samples, including any sample preparation methods used; and a description of the method used to identify and track samples to be analyzed (chain-of-custody procedures).
 - g. A description of the records which will be maintained, including the location, depth, and material type of each borehole; radiation level measurements made during gamma-logging of boreholes and onsite screening of soil samples; analyses of samples; calibration of instruments and daily instrument performance checks.
2. Submit plans for sampling water and sludge from Lake Denmark. Include the following information:
- a. The estimated size and volume of Lake Denmark, and the flow(s) of water into and out of the lake.
 - b. The location and depth of water samples, including the basis for choosing these sample locations.
 - c. The location and depth of sludge and lake sediment samples, including the basis for choosing these sample locations.
 - d. The method for obtaining water and sludge samples.
 - e. The method for analysis of samples, including the expected minimum detectable activity.
 - f. Other sources of potential contamination of Lake Denmark, in addition to your facility. 

RTI, Incorporated

4

3. Submit a description, with diagrams of the site, of groundwater flow and the hydrogeology of the site.
4. Submit a plan for sampling existing wells for the presence of cobalt-60 and migration of cobalt-60 in ground water from the site to Lake Denmark.

Thank you for your cooperation in this matter. If you have any additional questions, please contact me.

Sincerely,

John D. Kinneman, Chief
Site Decommissioning Management
Plan Task Force
Division of Radiation Safety
and Safeguards

030-07022

L-3

Process Technology North Jersey

Subsidiary of RTI Inc.

108 LAKE DENMARK ROAD, ROCKAWAY, NJ 07866
(201) 625-8400 • FAX: (201) 625-7820

May 25, 1993

John D. Kinneman, Chief
Nuclear Materials Safety Section B
Division of Radiation Safety and Safeguards
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

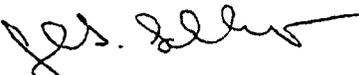
License No. 29-13613-02
Docket No. 030-07022
Control No. 11297
Subject: Remediation Activities

Dear Mr. Kinneman:

As a follow up to our letter of January 4, 1993, we are submitting the following information in regards to well monitoring.

Wells 15S and 4S were radiologically sampled on April 2, 1993 in accordance with the NJDEPE Field Sampling Procedure Manual. Samples were analyzed at the North Jersey Facility, as well as Duke University Medical Center. Results indicate no presence of Co-60 contamination.

Very truly yours,



John D. Schlecht
Radiation Safety Officer

JDS:jk

cc: P. Shapiro
J. Scandalios

NOT

114377
112974
MAY 27 1993

MAR 24 1993

Docket No. 030-07022
License No. 29-13613-02
Control No. 114377

MEMORANDUM TO: John E. Glenn, Chief
Medical and Commercial Use Safety Branch
Division of Industrial and Medical Nuclear Safety, NMSS

FROM: Ronald R. Bellamy, Chief
Nuclear Materials Safety Branch
Division of Radiation Safety
and Safeguards, RI

SUBJECT: Technical Assistance Request:
RTI, Incorporated (Process Technology)
Reduction of Limits for Contaminated
Soil On Site

RTI, Incorporated (formerly Process Technology) submitted a request in a letter dated January 3, 1991 to amend License No. 29-13613-02 to reduce the limits for possession of cobalt-60 in contaminated soil on their property. The licensee submitted information regarding the results of remediation activities in letters dated June 3, 1991; July 8, 1991; October 15, 1992; and January 4, 1993. Copies of these letters are enclosed. Information regarding past surveys to identify soil contamination and burial of materials on the site is found in their letters dated April 3, 1987; May 12, 1987; June 12, 1987; August 3, 1987; September 17, 1987; December 14, 1988; March 20, 1989; May 1, 1989; July 6, 1989; July 16, 1990; and August 30, 1990 and in the Oak Ridge Associated Universities Report "Radiological Survey, Radiation Technology Incorporated (Unrestricted Area), Rockaway, New Jersey" dated August 1987. These letters are included in the docket file and are in NuDocs.

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"SECTION COPY"

Memorandum
John E. Glenn

2

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Original Signed By:
Ronald R. Bellamy

Ronald R. Bellamy, Chief
Nuclear Materials Safety Branch
Division of Radiation Safety
and Safeguards

Enclosures:

1. RTI letter dated January 4, 1993
2. RTI letter dated October 15, 1992
3. NRC letter dated September 11, 1992
4. RTI letter dated July 8, 1991
5. RTI letter dated June 3, 1991
6. NRC letter dated May 2, 1991
7. RTI letter dated January 3, 1991

DRAFT DEFICIENCY

Docket No. 030-07022
License No. 29-13613-02
Control No. 114377

RTI, Incorporated
ATTN: John D. Schlecht
Radiation Safety Officer
108 Lake Denmark Road
Rockaway, New Jersey 07866

Dear Mr. Schlecht:

Subject: Remediation Activities

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We understand that contamination of soil on this site was caused by 1.) burial of material on the site, and 2.) release of contaminated water from the washing of resins, etc. We understand that buried material was only identified on two hand-drawn maps of the northeast corner of the fenced property. No additional records of these or other burials are known to exist. We further understand that buried material was recovered from a series of trenches dug in the northeast corner, and surveys of the trenches were performed. Based on our review of all these facts and all the information available to us, the following conclusions seem appropriate.

The criteria used for remediation of the locations you have designated as Areas A, B, C, and D was based on Regulatory Guide 1.109, NUREG-3332, and the MICROSIELD computer code. These were used to determine radiation levels which could be measured with a microR meter and were representative of the given release criteria of 8 picocuries of cobalt-60 per gram (pCi/g) of soil in unrestricted areas, and 15 pCi/g inside the fence. However, these documents assume that measured radiation levels are due to surface contamination migrating downward. Therefore, the radiation level surveys performed with the microR meter at the surface cannot be used to identify contaminated materials buried as much as six to eight feet below the surface and cannot be used as the basis for stating that no burial sites exist other than those remediated in the northeast corner.

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 - c. Biased core samples to determine the depth of soil contamination in Areas A, B, C, and D.

- d. Gamma logging of bore holes, and on-site screening of soil samples to identify the maximum radiation level from each core sample.
 - e. Analysis of the cobalt-60 concentration of the sample having the maximum radiation level reading for a given borehole; and analysis of any sample which exceeds a predetermined trigger level during onsite screening.
 - f. A description of the instrumentation to be used for radiation level measurements, gamma-logging of boreholes, and onsite screening of soil samples; a description of the equipment to be used for drilling core soil samples; a description of the methods used to determine the cobalt-60 content of the soil samples, including any sample preparation methods used; and a description of the method used to identify and track samples to be analyzed (chain-of-custody procedures).
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- a. The estimated size and volume of Lake Denmark, and the flow(s) of water into and out of the lake.
 - b. The location and depth of water samples, including the basis for choosing these sample locations.
 - c. The location and depth of sludge and lake sediment samples, including the basis for choosing these sample locations.
 - d. The method for obtaining water and sludge samples.
 - e. The method for analysis of samples, including the expected minimum detectable activity.
 - f. Other sources of potential contamination of Lake Denmark, in addition to your facility.

RTI, Incorporated

4

3. Submit a description, with diagrams of the site, of groundwater flow and the hydrogeology of the site.
4. Submit a plan for sampling existing wells for the presence of cobalt-60 and migration of cobalt-60 in ground water from the site to Lake Denmark.

Thank you for your cooperation in this matter. If you have any additional questions, please contact me.

Sincerely,

John D. Kinneman, Chief
Site Decommissioning Management
Plan Task Force
Division of Radiation Safety
and Safeguards

Process Technology North Jersey

Subsidiary of RTI Inc.

108 LAKE DENMARK ROAD, ROCKAWAY, NJ 07866
(201) 625-8400 • FAX: (201) 625-7820

January 4, 1993

John D. Kinneman, Chief
Nuclear Materials Safety Section B
Division of Radiation Safety and Safeguards
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

License No. 29-13613-02
Docket No. 030-07022
Control No. 11297
Subject: Remediation Activities

Dear Mr. Kinneman:

As committed to in our letter of October 15, 1992 the following additional information is submitted:

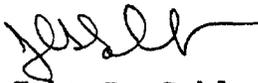
1. A systematic survey of the leach field area indicates no Co-60 contamination. Background readings are approximately 7 ur/hr in this area. The highest reading in the leach field area is 12 ur/hr. Readings were taken on a 5' grid of the 20' x 50' leach field. No remediation in this area is indicated.
3. Request for NJDEPE permission to monitor wells 15S and 4S has been submitted. A copy of this request is enclosed. Monitoring of wells 15S and 4S will begin first quarter 1993.
6. Using the "NE" corner of the property as reference (360 degrees) Area "C" is approximately 400 feet from the "NE" corner at 230 degrees WSW. Area C extends from the property fenceline approximately 150' WNW to the abandoned railroad bed. Area C is approximately 45 feet in width as indicated in the drawings submitted August 30, 1990.
18. (a) Soil density calculations from samples taken in 1989 indicate a density range of 0.5 to 0.9 g/cm³. The average soil density is 0.7 g/cm³. Utilizing a density of 0.7 g/cm³ in the microshield calculations utilized and submitted with our January 3, 1991 letter yields a value of 18 ur/hr above background at 1 meter for 15 pCi/g Co-60 contamination. Previous results for 1 g/cm³ soil yielded a value of 22 ur/hr above background at 1 meter for 15 pCi/g Co-60 contamination. The results for 0.7 g/cm³ soil do not change the conclusions previously submitted on January 3, 1991 in relation to areas A, B, C and D meeting either the 8

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JAN 05 1993

Page two
January 4, 1993
Mr. John D. Kinneman, Chief

pCi/g or 15 pCi/g criteria. The highest reading in Areas A and D which both meet the 15 pCi/g criteria is 21 ur/hr including background. Background readings documented on the surveys previously submitted are 5 ur/hr. This would yield a net dose rate of 16 ur/hr above background, which is below the 18 ur/hr criteria for 15 pCi/g. The highest readings in Areas B and C which both meet the 8 pCi/g criteria is 9 ur/hr including background. This would yield a net dose rate of 4 ur/hr above background which is below the 9 ur/hr criteria for 8 pCi/g.

Very truly yours,



John D. Schlecht
Radiation Safety Officer

JDS:jk

RTI Inc.

108 LAKE DENMARK ROAD, ROCKAWAY, NJ 07866
(201) 625-8400 • FAX (201) 625-7820

New Jersey Department of
Environmental Protection
Bureau of Site Management, CN413
401 E. State Street, Sixth Floor
Trenton, NJ 08625

Attention: Mr. Gil Horwitz

December 18, 1992

Dear Gil:

To satisfy the US Nuclear Regulatory Commission that there is no radioactive contamination in the ground water, RTI Inc proposes to test water from wells 4S and 15S for radioactivity on a quarterly basis for 2 years.

Would you please document to us that this is acceptable to the NJDEPE and supply us with the key(s) to open the well heads.

Sincerely;



Paul O. Shapiro VP
Regulatory Affairs

cc:

J. Scandalios
J. Schlecht

RTI Inc.

108 LAKE DENMARK ROAD, ROCKAWAY, NJ 07866
(201) 625-8400 • FAX (201) 625-7820

MS 16
Q-5

October 15, 1992

Mr. John D. Kinneman, Chief
Site Decommissioning Management
Plan Task Force
Division of Radiation Safety and Safeguards
United States
Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

License No. 29-13613-02
Docket No. 030-07022
Control No. 114377

Dear Mr. Kinneman:

Subject: Remediation Activities

In response to your letter dated September 11, 1992 the following are responses to your requests:

1. Radiation surveys were performed in all areas prior to our January 3, 1991 submittal. The only survey information documented and submitted were for those areas exceeding the 11 ur/hr above background limits. All other areas were below action levels. Since the leach field is a special case, we will re-survey that area and submit documentation to you by December 31, 1992. All areas exceeding current trigger level have been identified and remedial activities completed. Documentation was submitted to Region I.
2. The only water that drains into the septic system/leach field is from the facility bathrooms and lunch rooms in Building 50 and the holdup tank in Building 61. A detailed survey of the leach field will be submitted by December 31, 1992. Water from the holdup tank is analyzed for radioactive contamination in accordance with Procedure 10.110.
3. RTI will sample wells 15S and 4S on the enclosed map after approval is obtained from the NJ DEPE to do so. Thereafter, sampling for radioactivity will be done quarterly for the next two years. The DEPE controls all the wells except P6.
4. It is not known whether Co-60 contamination migrated to this area or if contaminated liquid was dumped in this area. No information is available. Migration to Lake Denmark is not expected due to the topography. Monitoring of wells 15S and 4S will be documented.

114377

OCT 19 1992

Page two

5. 1. Surveys were performed of the entire site. Any area exceeding 11 ur/hr above background was documented. One core sample was taken of Area A as documented in our August 30, 1990 submittal. All areas excavated in 1987 were surveyed and backfilled only if surveys indicated less than 30 ur/hr at 1 meter. Excavated areas varied from 5 to 8 feet in depth. This would indicate that maximum contamination levels at that time were below 20 pCi/g at depths greater than 8 feet. Bedrock on the property ranges from 8 to 14 feet. It would therefore not be reasonable to assume any additional radioactive material or contamination based on this and data already submitted. Additionally a drawing documenting the location of where the material was buried in 1977 does not indicate any area other than the NE corner of the property. A copy of this drawing is enclosed. At this time any contamination below the 8 foot level must be below 10 pCi/g considering that one half life has passed since the 1987 excavations.
2. Data supporting the lg/ml soil density will be submitted by December 31, 1992.
6. Your understanding of the size of Area C is correct. The additional information requested regarding Area C will be submitted by December 31, 1992.
10. Lake Sludge samples were taken by RTI on 11/3/88 and 4/18/89. The sample taken on 11/3/88 indicated 1.4 pCi/g and the sample taken on 4/18/89 indicated 2.4 pCi/g. A sample of the lake water taken on 10/25/88 indicated no activity (CMDA). Samples of lake sludge were also taken by either Marlene Taylor or John Miller, USNRC, Region I during 1987. Though results of these samples are not locatable at present, it is believed that none indicated a contamination level in excess of 4 pCi/g.
13. All surveys in the trenches indicated less than 30 ur/hr at 1 meter. Soil samples from the pit excavations in 1987 indicated soil activities less than the 8 pCi/g limit.
14. The current management has a document describing the location of a burial of material in 1976 and 1977 which is enclosed. Documentation of the removal in 1987 is available but very sketchy. Waste manifests from 1987 are enclosed. Your understanding of the probable source of material is correct.

Page three

18. (a) The basis for assuming the density of soil to be 1g/ml will be submitted by December 31, 1992. (b) the basis for assuming that contamination extends to a depth of 1 foot is that soil sampling and the core sample taken in Area A indicated that the contamination dropped below 8 pCi/g at approximately 9" of depth. (c) Areas B and C can be excluded because they are believed to be below the 8 pCi/g release criteria.

Very truly yours,

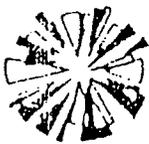


John D. Schlecht
Radiation Safety Officer

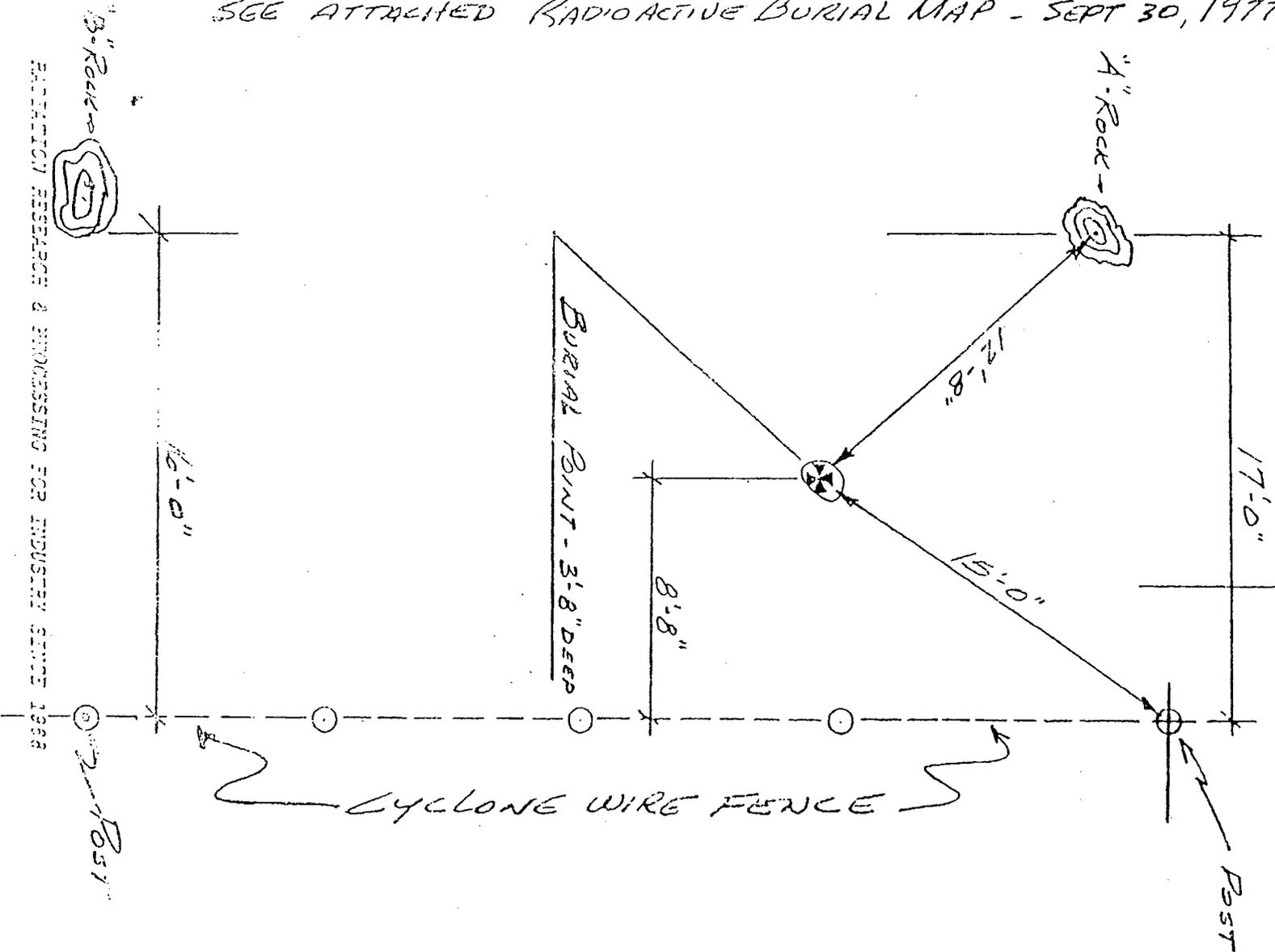
JDS:jk

Radiation Technology, Inc.

LAKE DENMARK ROAD, ROCKAWAY, N.J. 07866
(201) 627-2900



SEE ATTACHED RADIOACTIVE BURIAL MAP - SEPT 30, 1977



RADIOACTIVE BURIAL AREA
SEP. 30 1977

RADIOACTIVE BURIAL AREA
DEC 11 1976

WAREHOUSE
BUILDING
7200 sq ft
APR. 11 1975

EXISTING CLEARED AREA
RESERVED FOR
FUTURE PARKING (99 CARS)
WHEN REQUIRED

EXISTING CLEARED
FUTURE PARKING AREA
104 CARS

EXISTING 25'
WIDE GRAVEL
DRIVE, PROVIDE
SEAL COAT

EDGE OF WOODED AREA

RADIATION TECHNOLOGY
LAKE DENHAM ROAD
ROCKAWAY, N.J.

296'-0"

654.72'
S 53° 51' E

BLOCK 240
LOT 107

(8430)
9465
S 11° 12' E
915.43'

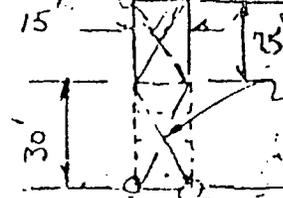
S 11° 12' E
915.43'

10' WIDE
DRIVE

also
Add
Area

B-Road

LARGE ROCK
PROTRUDING ABOVE
GROUND



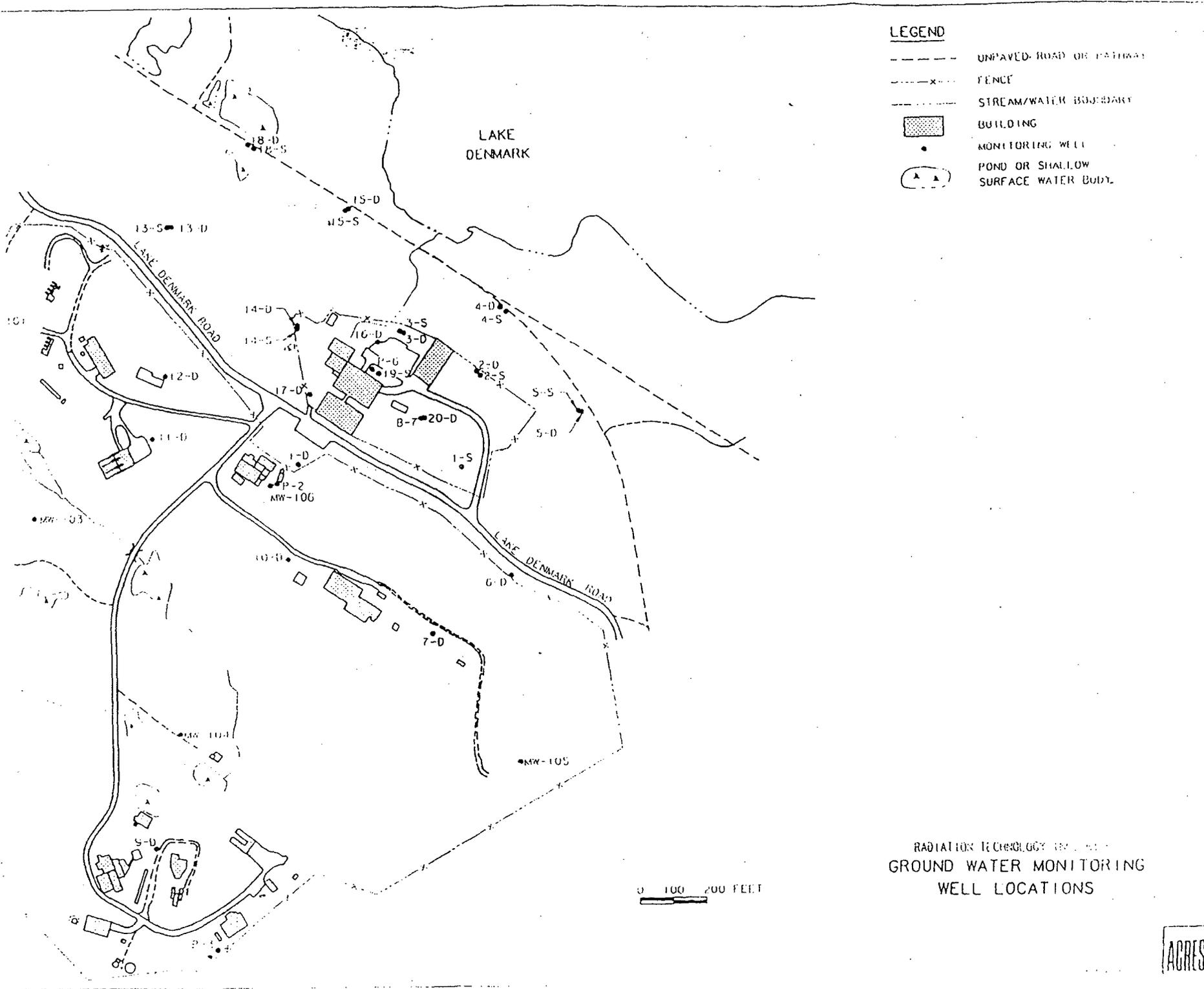
RTI INC.
CORPORATE REGULATORY AFFAIRS

TO: RSO File
FROM: P.O. Shapiro *ps*
DATE: October 9, 1992
SUBJECT: Wells on RTI Site

Currently we have the following information relating to wells on the 15 acre RTI site. All information has been obtained from the Acres RI report dated Sept. 1991.

All of the wells are controlled by the New Jersey Department of Environmental Protection and Energy (DEPE) except for well P6 which is controlled by RTI.

Well #	Depth in Ft	Comments
MW-1D	60	Drilled by RTI
MW-1S	30	Drilled by RTI
MW-2D	65	Drilled by RTI
MW-2S	30	Drilled by RTI
MW-3D	50	Drilled by RTI
MW-3S	30	Drilled by RTI
B-7	12	Drilled by Acres International
MW-4S	31	Drilled by Acres International
MW-4D	90	Drilled by Acres International
MW-5S	33.5	Drilled by Acres International
MW-5D	86.5	Drilled by Acres International
MW-13S	14	Drilled by Acres International
MW-13D	71	Drilled by Acres International
MW-14S	17	Drilled by Acres International
MW-14D	76.4	Drilled by Acres International
MW-15S	20.5	Drilled by Acres International
MW-15D	92	Drilled by Acres International
MW-16D	90.6	Drilled by Acres International
MW-17D	86	Drilled by Acres International
MW-18S	18	Drilled by Acres International
MW-18D	87	Drilled by Acres International
MW-19S	13.5	Drilled by Acres International
MW-20D	97	Drilled by Acres International
P6	373	Drilled by RTI. Contains an inoperable pump, wiring and discharge pipe thus can not be sampled with a submersible pump.



LEGEND

- UNPAVED ROAD OR PATHWAY
- x- FENCE
- STREAM/WATER BOUNDARY
- BUILDING
- MONITORING WELL
- POND OR SHALLOW SURFACE WATER BODY

RADIATION TECHNOLOGY
**GROUND WATER MONITORING
 WELL LOCATIONS**



114377

"SECTION COPY"

radiology, Inc. BARNWELL WASTE MANAGEMENT FACILITY
 Operated by CHEM-NUCLEAR SYSTEMS, INC.
 PO Box 726, Barnwell, South Carolina 29812
 (803) 259-1781
 RADIOACTIVE SHIPMENT MANIFEST FORM

27866
201/625-8400

(3) RADIOACTIVE WASTE TRANSPORTATION PERMIT NO. 0440-29-87-X

CARRIER Veron
 TELEPHONE 803/259-1781 SHIPPING DATE 28 Dec 87
 SHIPMENT TYPE Veron SHIPMENT SURFACE EXPOSURE 7.5 mR/hr
 CASK IDENTIFICATION NO. N/A USA 1
 SHIPMENT NO. 001 LINER TYPE N/A
 LINER SERIAL NO. N/A
 DRIVER SIGNATURE Ernest Denny DATE 12-28-87

(4) USE THIS NUMBER ON ALL CONTINUATION PAGES

SHIPMENT I.D. NUMBER 1287-334 PAGE 1 OF 4

NAME & HAZARD CLASS (R 172 101)	I.D. NUMBER	Reportable Quantity
yes	UN2908	
- Radioactive Material	UN2918	
activity n.o.s. - Radioactive Material	UN2912	
Radioactive Material	UN2982	
ity, n.o.s. - Radioactive Material	UN2910	
n.o.s. - Radioactive Material	UN2974	
and articles - Radioactive Material	UN2911	

(7) SHIPMENT TOTALS								
Disposal Volume (ft. ³)	Total Pallet Volume (ft. ³)	Total No. of Packages	ACTIVITY (10CFR20.311) Millicuries					Source (Pounds)
			AM Isotopes	Tritium	C-14	Tc-99	I-129	
221.6	0	29	4.95	NP	NP	NP	NP	0

(8) TOTAL SNM		
Isotope	Grams	No. Packages
U-233	0	NP
U-235	0	NP
Total	0	0

(9) MINIMUM % FILL FOR STABILIZATION PROCESS N/A (10) SOLIDIFICATION AGENT None (11) NUMBER AND TYPE OF CONTAINERS (28) 55gal Steel drums
(1) 85gal "

(13) PHYSICAL FORM Solid
oil, metal, fresh soil, and filters
 EXCLUSIVE USE. LOADING AND UNLOADING MUST BE BY THE SIGNOR OR CONSIGNEE OR HIS DESIGNATED AGENT.

(14) CHEMICAL FORM Oxides/0 (15) NAME AND % OF CHELATING AGENT(S) None - 0 (16) WASTE FORM CLASS W A AS B C

(19) "Certification is hereby made to the South Carolina Department of Health and Environmental Control that the shipment of low-level radioactive waste has been inspected in accordance with the requirements of South Carolina Radioactive Material License No. 097 as amended, and the Nuclear Regulatory Commission's License No. 12-13538-01 as amended, and the effective Barnwell Site Disposal Criteria within 48 hours prior to shipment, and further certification is made that the inspection revealed no items of non-compliance with all applicable laws, rules and regulations."

Date 12-28-87 Signature Ernest Denny
 Title and Organization Operations Supervisor
 Telephone No. 201 625-8400

named materials are properly classified, described, packaged, and labeled for transportation according to the applicable regulations of the Department of Transportation.
Denny
radiology, Inc. Date 12-28-87

CNSI USE ONLY

ments.
 accordance with license.

SEP 11 1992

License No. 29-13613-02
Docket No. 030-07022
Control No. 114377

Process Technology of North Jersey
Incorporated
ATTN: John D. Schlecht
Radiation Safety Officer
108 Lake Denmark Road
Rockaway, New Jersey 07866

Dear Mr. Schlecht:

Subject: Remediation Activities

On December 3, 1991, Betsy Ullrich and Jim Bondick of this office conducted an announced site visit to examine activities authorized by the above listed NRC license and described in your letters dated June 3, 1991 and July 8, 1991. The visit was limited to a survey of the areas inside and outside the fence surrounding the irradiator and other buildings, and those areas from which soil contaminated with cobalt-60 was removed. A discussion was held with John Schlecht, the Site Radiation Safety Officer and Plant Manager, at the end of the visit. A summary of this visit is included as Attachment A to this letter.

This also refers to your letters dated June 3, 1991 and July 8, 1991 regarding the remediation of contaminated soil at the Process Technology North Jersey facility in Rockaway, New Jersey. We have reviewed the information submitted in these letters, as well as information submitted in the past, to support your request to reduce the amount of cobalt-60 contaminated material listed on your license. In order to continue our review, we request the following:

1. The only systematic radiation level surveys performed of major areas inside the fence appear to be those documented in your letter to Region I dated May 12, 1987. However eight areas are identified as not included in the survey results submitted in the May 12, 1987 letter. These areas include the leach field, tanker area, woods south of tankers, west drum pad, woods south of equipment room, trailer area, picnic area, woods north of Building 62, and woods northeast of fence. Please submit a plan for completing these surveys of these areas. Particular attention should be given to the area known as the septic system area or leach field. Any areas which exceed your current trigger level for remediation must be identified, and plans for remedial activities must be submitted to Region I with the results of the surveys.

2. Clarify which buildings currently drain into the septic system/leach field, or have done so in the past. Please confirm what systems, such as floor drains, sewage, sink drains, etc., empty into the leach field system. Describe any sampling that is or has been done for cobalt-60 in the leach field system, including water prior to its release to the system or from a holdup tank, or soil from the leach field.
3. Identify the locations and depth of current wells on your property, and the agency who currently controls the use of these wells. Submit a plan for sampling and analysis of water from the wells to determine if any migration of cobalt-60 is occurring in groundwater, and confirm that you will sample these wells at least quarterly. If you have performed any sampling of these wells since 1986, please submit the results of analyses of the samples.
4. Please submit a description of the source of the contamination in Area C described in the June 3 and July 8, 1991 letters. Describe the method by which you believe cobalt-60 migrated into this area. Please state if you expect that such migration of cobalt-60 through this area to Lake Denmark will continue, and the basis for this opinion.
5. The following Item Numbers refer to our questions in a letter dated May 2, 1991 and your responses to these items in your letters listed above. Please clarify the following:

Item 4.a., 4.b., 8., and 15:

1. Both Regulatory Guide 1.109 and NUREG 3332 assume that the soil contamination is due to surface contamination migrating downward. On this basis, and your description of MICROSHIELD, we conclude the radiation level surveys performed with the microR meter cannot be used to identify contaminated materials buried as much as six to eight feet below the surface. In addition, the magnetometry scan covered only a small portion of the fenced area, and did not include areas closer to the warehouse, or west of the buildings. It is our understanding that no other surveys or sampling were performed to determine if radioactive material is buried in any other areas within the fenced site (or on any other areas of your property) and that no core samples were performed as planned in the July 16, 1990 letter.

2. In using the MICROSIELD computer code to determine the radiation levels which would be measured at one meter above soil containing 8 and 15 picocuries of cobalt-60 per gram of soil, a density of 1.0 grams of soil per milliliter (g/ml) volume was used. This density could result in underestimating the amount of cobalt-60 actually in the soil, if the actual density of soil on your site is greater than 1.0 g/ml. Please describe the basis for selecting 1.0 g/ml as the density of soil for this case.
- Item 6. Using the northeast post of the fence line as "zero" (as was done in the magnetometry scan), please state the location on the fence line due west of that fencepost, at which Area C is considered to begin and end, and the true compass direction of Area C with respect to the fence and Lake Denmark. Please confirm our understanding that Area C is approximately 60 feet wide by 200 feet long, and that it begins at your fence line and extends to the former railroad bed. Describe any surveys or sampling performed between the railroad bed and Lake Denmark, and submit the results.
- Item 10. In your June 3, 1991 letter you state that sludge and/or water samples were taken from Lake Denmark, however, we do not have any record of samples or results of these samples. Please state how many sludge samples and how many water samples were taken from Lake Denmark, and the dates on which sampling occurred. Describe the sampling methods. Submit the results of analyses of these samples, and a description of the analytical methods used, including any treatment of the samples prior to analysis.
- Item 13. The radiological surveys submitted of Areas A, B, C, and D in the letter dated January 3, 1991 have been received and reviewed. However, we have no results of any surveys you performed of the trenches dug in 1987 to uncover buried radioactive material. Please submit results of any surveys and any soil samples you performed of these trenches.

- Item 14. We understand that current management has no documents describing the burial, and subsequent removal in 1987, of cobalt-60 contaminated material in the northeast corner of the property, but that you believe the material was buried in 1976 and 1977, and that no other material was buried elsewhere on the property. We further understand that you believe this material was most likely resins and contaminated materials from clean-up of the pool after discovery of a leaking source. If our understanding is not correct, please inform us in writing.
- Item 18. In your letter dated June 3, 1991, you have assessed the total amount of cobalt-60 remaining in soil to be 0.69 millicuries, based on the total area of Areas A and D being contaminated at 8 picocuries per gram to a depth of 1 foot, and assuming that the density of soil on your property is 1 gram per milliliter. Please state the basis for assuming that a) the density of soil to be 1 gram per milliliter; b) contamination extends to a depth of 1 foot; and c) Areas B and D can be excluded.

We will continue our review of your application upon receipt of the above information. Please reply in duplicate to my attention at the Region I office and refer to Mail Control No. 114377.

Sincerely,

Original Signed By:
Francis M. Costello



John D. Kinneman, Chief
Site Decommissioning Management
Plan Task Force
Division of Radiation Safety
and Safeguards

Attachment: Attachment A: Site Visit to Process Technology North Jersey on
December 3, 1991

ATTACHMENT A

Subject: Site Visit to Process Technology North Jersey,
December 3, 1991

An announced site visit was performed by Betsy Ullrich and Jim Bondick to review the remediated areas identified as Area A, Area B, Area C, and Area D in the licensee's letter dated January 3, 1991; areas where pits had been dug in 1987 to locate and excavate buried contaminated material; and to discuss surveys and sampling performed at the site.

During the visit, it was noted that all areas within the fenceline in which soil had been excavated had been filled in, but these areas do not appear to have been compacted or graded. Some of the former pits in the northeast corner contain low spots. All areas are overgrown with grass and weeds. The excavated site outside the fence, known as Area C, is located in the woods. The fenceline at the beginning of this area is currently barbed wire, instead of the chainlink fencing used for the remainder of the fence. This area appears to be a natural run-off where water collects from areas within and outside the fence at the south and west sides of the property, and drains into Lake Denmark. Most markers indicating the remediated area were still visible, but many were knocked over.

The inspectors performed surveys using a Ludlum Model 19 MicroR Survey Meter, Serial No. 019633. Background radiation levels measured with this instrument were 15-20 microrentgen per hour (uR/hr). No radiation levels above background were detected in the northeast corner of the property (Areas A and B), or in areas outside the north and west fence, including an area where items such as drums, containers and other debris were located outside the fence in the woods. No areas above background were noted in Area C, in the woods surrounding Area C, or along the railroad bed between the property and Lake Denmark, except for several rocks reading 40 uR/hr. No surveys were performed in Area D or the leach field, because the irradiator was in use and radiation levels in these areas were elevated, ranging from 15 uR/hr at a distance up to several hundred uR/hr near the irradiator building.

Six wells were observed inside the fenced area. John Schlecht stated that these wells are controlled by the Environmental Protection agency (EPA), but that PTNJ could obtain samples for cobalt-60 analysis by contacting the EPA. The EPA has completed Phase II of their study of the RTI property, although most of the EPA work focused on the portion of the property across the street from the fenced area. John Schlecht that he has performed analysis for cobalt-60 in water samples from the facility's well, as well as water and sediment from Lake Denmark.

We also understand from the conversation that the leach field in the southernmost portion of the fenced area was installed in the mid-1980's and is unlikely to be contaminated with cobalt-60. Mr. Schlecht stated that the leach field is used primarily for the septic system, the floor drains in the irradiator building lead to a holding tank which releases to the leach field. No records of the results of samples taken prior to these releases were reviewed during this visit, however, if cobalt-60 is released to this area and becomes trapped in the soil, the concentration of cobalt-60 in the soil of the leach field could build up to levels which may require remediation. This area may require sampling in the future.

Based on the visit of this site, and the information supplied in your letters regarding the remediated areas, we will continue our review of your request to amend your license to remove the specific listing of cobalt-60 contaminated soil. We will contact you for additional information required for this review. If any of our understandings are incorrect, please notify us in writing.

Process Technology North Jersey

Subsidiary of RTI Inc.

July 8, 1991^{108 LAKE DENMARK ROAD, ROCKAWAY, NJ 07866}
(201) 625-8400 • FAX: (201) 625-7820

John D. Kinneman, Chief
Nuclear Materials Safety Section B
Division of Radiation Safety and Safeguards
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

License No. 29-13613-02
Docket No. 030-07022
Control No. 11297

Dear Mr. Kinneman:

As indicated in our June 3, 1991 submittal, enclosed please find the responses to the remaining items from your May 2, 1991 letter.

4.a. An analysis was performed using the data developed by Chem-Nuclear Systems Inc. of soil samples and surface radiation measurements. The data was taken from surveys performed on May 30 and 31, 1990. The data for two areas are shown in Figures 1 and 2.

Examination of the figures shows that one cannot develop an analytical expression or an algorithm to accurately estimate surface photon flux from measured soil concentration. There is too little data for an accurate predicting tool to be developed. Furthermore, as noted in our consultants assessment of the Chem Nuclear study, the use of surface photon flux measurements is severely limited by geometry concerns. Measurements made 1 meter above the surface tend to resolve inconsistencies inherent in surface measurements and eliminate the impact of very small local "hot spots" that inappropriately bias surface measurements.

Empirical studies were not made as part of our surveys to demonstrate the efficacy of a correlation between soil concentration of cobalt-60 and micro-R meter survey results. There are significant data available based on both empirical and theoretical analyses that support the use of micro-R measurements above the surface. Such data and measurement methodologies are documented in NRC Regulatory Guide 1.109 and in NUREG/CR 3332. Both of these documents were referenced in our consultant's study and recommendations. Furthermore, analyses were made using the MicroShield computer code that predicted dose rates at one meter above the soil that were largely independent of the depth of soil contamination down to depths of at least 30 centimeters (one foot). The data in the sources consulted including the shielding analyses were complimentary. The soil shielding analyses included uniform and non-uniform depositions. The analyses used

MS 16

114377

Page two
John D. Kinneman
NRC
July 8, 1991

by us and recommended by the consultant was a soil deposition with an exponentially decreasing concentration as would be found in the case of a non-ionic relatively insoluble front moving through clay and clay-sand soils.

4b. An evaluation of the potential for buried radioactive material on the RTI property was made utilizing radiation surveys and by using a magnetometer. The magnetometer is capable of detecting the presence of masses of ferromagnetic material such as a steel barrel at depths in soil up to 2 -3 meters. A survey of the grounds using a magnetometer was taken on April 6, 1987. This survey is included as attachment A. Results of the magnetometer survey indicated ferromagnetic materials in several areas. These areas were subsequently excavated and designated pits 1 through 5 as indicated on the sketch included as attachment B. Radiation surveys were performed subsequent to excavation and removal of radioactive items in these areas. These surveys were included in our June 3, 1991 letter.

4c. Four areas of soil contamination or burial were identified based on physical measurements, reviews of records, and interviews with employees. In two areas, identified as C and D in our June 3, 1991 correspondence, the sources of contamination are known to have been surface spills in nature. The radioactive species are not known to be ionic in nature nor bound up in a transportable organic matrix. Several shallow digs in area C revealed no contamination below 5 - 10 centimeters. In the case of area D, complete soil removal was effected to a depth of 30-40 centimeters using hand and machine excavation. Surface and above surface measurements of dose rates were at background levels following the excavation. We think it unlikely that contamination were of such nature that it would pass through the soil in a series of discontinuous fronts (such as in a liquid chromatograph) such that it would not be detected by a micro-R meter. Thus, once background was established release criterion dose rates were measured, we concluded that for areas C and D no further action was required. Areas A and B were evaluated as described in response to question 4B. above.

11a. The letters dated April 3, 1987, June 10, 1987, and August 3, 1987 list the complete inventory of radioactive waste found in each pit to the best of current management's knowledge. The only other material removed was the contaminated soil which was disposed of in February 1991 as described in our January 3, 1991 submittal.

11b. The physical location of each pit is indicated on the sketch included as Attachment B. Pits 1,2,3 and 4 are in the same general area as Area B of our January 3, 1991 submittal.

Page three
John D. Kinneman, Chief
NRC
July 8, 1991

Pit 5 was located in the general area indicated on attachment B. As indicated in our September 17, 1987 letter, no radiological or hazardous waste was found in pit 4 or 5.

11c. Copies of the waste manifest forms for the disposal of all radioactive items excavated from pits 1 through 4 are enclosed as attachment C. Copies of the waste manifest forms for the disposal of contaminated soil during 1991 are enclosed as attachment D.

12. A sketch indicating the position of all pits is enclosed as attachment B. As indicated in our August 3, 1987 submittal, no radiological or hazardous materials were discovered in pits 2 and 3. Radioactive waste was removed from pit 1. As indicated in previous submittals pits 2, 3, 4 and 5 were excavated to a depth of 6 feet. Pit 2 was excavated to a depth of 9 feet. It is believed that radioactive material was excavated at depths ranging up to 6 feet.

13. Soil samples and radiological surveys of the trench areas were previously submitted in our January 3, 1991 letter. It was indicated during our August 3, 1987 and September 17, 1987 submittals that surveys of all trenches were taken prior to backfilling. No copies of these surveys are available. All surveys submitted with our January 3, 1991 letter are after backfilling.

14. To the best of current management's knowledge the radioactive items unearthed during the 1987 remediation were buried in 1976 and 1977 by prior management. These items were most likely contaminated items and resins generated from a leaking source which was introduced into the R & D pool in 1976. This is the only information that current management has regarding that burial site.

15a. Surveys of the northeast corner of the fence were submitted with our January 3, 1991 letter (Area B). These surveys were conducted in the same areas as those excavated in 1987. Those areas excavated were those areas which indicated ferromagnetic items subsequent to the magnetometer survey conducted in April 1987. Since these areas were already excavated extensively and all radioactive items removed, it is reasonable to assume that no further buried radioactive items exist in these areas. Furthermore, radiological surveys submitted in our January 3, 1991 letter show that radiation readings do not support an assumption that there are further buried radioactive materials.

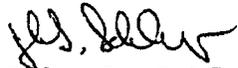
15b. Due to the fact that all excavations were performed in areas where magnetometer surveys indicated ferromagnetic anomalies and

John D. Kinneman, Chief
NRC
July 8, 1991
Page four

all buried radioactive material was removed it is assumed that no further buried radioactive material exists. Radiological surveys subsequently performed support this.

Furthermore, the single core sample that was taken was taken to a total depth of approximately 5 feet as indicated in our June 3, 1991 submittal. No plans for further core sampling presently exist.

Very truly yours,

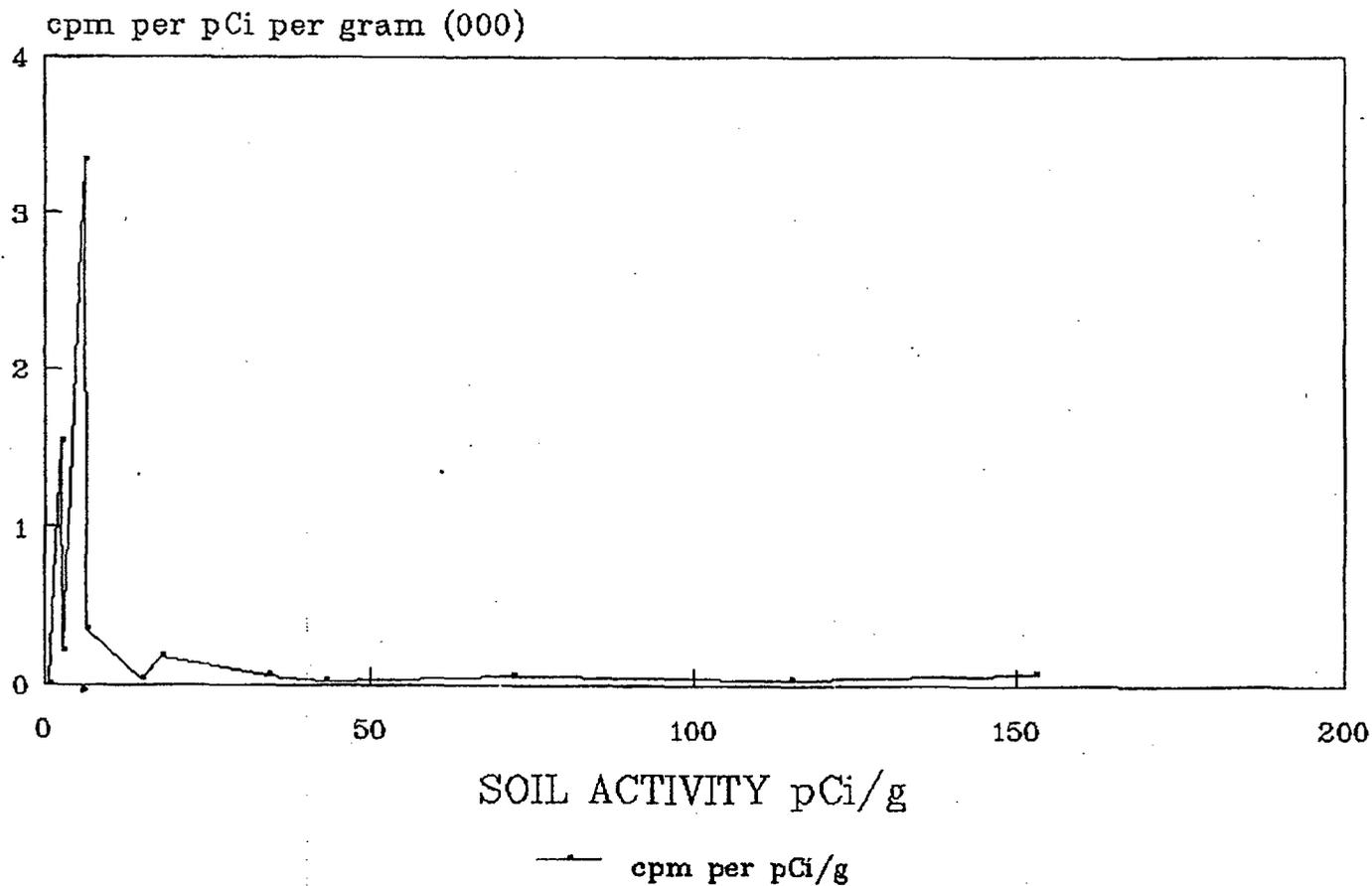


John D. Schlecht
Plant Manager and
Radiation Safety Officer

JDS:jk
Attachments

Figure 1

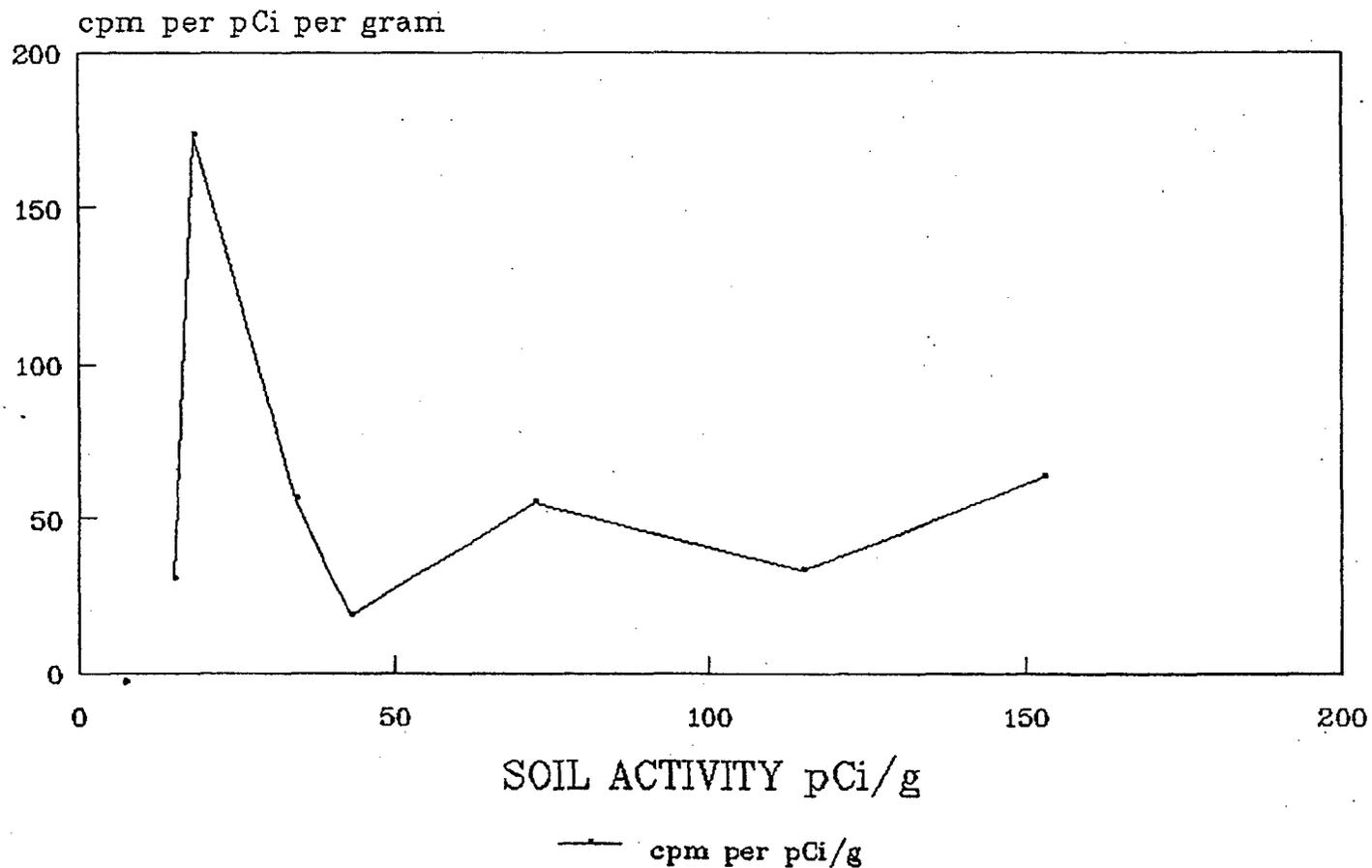
ACTIVITY - COUNT CORRELATION CHEM NUCLEAR SURVEY



DATA FROM 5/30-31/90 SURVEY

Figure 2.

ACTIVITY - COUNT CORRELATION CHEM NUCLEAR SURVEY



DATA FROM 5/30-31/90 SURVEY



April 15, 1987

Project No. 303382

Mr. Tass Varaklis
Radiation Technology, Inc.
108 Denmark Road
Rockaway, NJ 07866

Letter Report
Magnetic Survey
Radiation Technology, Inc.
Rockaway, New Jersey

Dear Mr. Varaklis:

This letter report presents the results of a magnetometer survey conducted at the Radiation Technology, Inc. (RTI), site in Rockaway, New Jersey by International Technology Corporation (IT). The purpose of the investigation was to detect the presence of buried ferromagnetic materials. The results of the survey will then be used by RTI in their planning of additional investigations with respect to the delineation of buried drums which were reportedly disposed of at that site.

BACKGROUND

The site is a level, grass-covered area approximately 100 by 200 feet surrounded on two sides by a metal, chain-link fence and on a third side by an asphalt roadway (Figure 1). Portions of the eastern edge of the site indicated evidence of previous excavations and small rocks littered this area. It is unknown whether these rocks were indigenous to the site or were imported for use as fill material.

The rocks observed and noted on the site consisted of granites, conglomerates, and sandstones (including arkosic sandstone). Two specimens collected were magnetic and thus inferred to contain a large quantity of magnetite. Therefore, natural interferences from the magnetite-rich rocks encountered in the process of surveying exist but, due to sparse site-specific information, the extent of these interferences cannot be estimated at this time.

Three of the conglomerates observed on site were boulder sized and very well rounded. The variety of rock types and the well-rounded appearance of the conglomerates indicate the rocks may be of glacial origin. However, without more information about local bedrock and geology, no firm conclusions can be provided at this time.

Regional Office

William Penn Plaza • 2790 Mosside Boulevard • Monroeville, Pennsylvania 15146-2792 • 412-243-3230

Mr. Tass Varaklis

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April 15, 1987

Magnetic interferences on site included the chain-link fence on the northern and eastern edges of the site, an earthen pile which contained scrap metal, a monitoring well in the northwest corner of the site, and three to four concrete blocks which contained pieces of metal pipe. Locations of any underground pipelines/conduits were unknown.

A three-foot-by-three-foot area on the eastern portion of the site was cordoned off by RTI as part of their radiation protection requirements, and this particular area was excluded from the survey.

SUMMARY OF MAGNETIC SURVEY PROCEDURE

The intensity of the earth's magnetic field can be measured with a magnetometer. The unit of intensity is the gamma, which is defined in terms of the force that a magnetic field will place on a standard magnet. The intensity of the earth's magnetic field ranges from 35,000 to 75,000 gammas (measured at the earth's surface), and differences from the normal or background intensity constitute magnetic gradients or anomalies. The change of the intensity over distance (i.e., the gradient) and relative differences between intensity values are the features which are interpreted to identify magnetic anomalies. The absolute value of a given data point is of little use without another data point to which it can be compared.

A zero value for the magnetic gradient indicates that the total magnetic field is the same at both sensors at the data point location. This would indicate that the immediate magnetic field is not affected by any nearby magnetic objects.

The magnetometer used in this study was an EDA OMNI IV Tie-Line Magnetometer. The solid-state memory has capacity for 1,200 gradient readings. The sensor is external and is separated from the instrument so it is relatively unaffected by the magnetic field generated by the observer and it can be easily positioned away from the recording instrument. The sensor head is mounted on a collapsible aluminum staff and the instrument operates on a large rechargeable battery.

FIELD OPERATIONS

On April 6, 1987, the IT geophysical crew arrived at the RTI site to perform the magnetic survey. A grid was set up on the survey area using pin flags placed at five-foot intervals along the northern and eastern edges of the site, one row through the center of the site (north to south), and a row at 15-foot intervals along the western edge of the site. Lines and positions were set up with line numbers increasing to the south and position numbers increasing to the west. A 200-foot rope marked in five-foot intervals was then stretched from east to west (along Line 10), using the pin flags to align the rope correctly.

Mr. Tass Varaklis

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April 15, 1987

The magnetometer survey was conducted by entering the coordinates of the first point into the instrument along with the line and position intervals. Readings were taken at known coordinates every five feet along a line. The instrument automatically updated the position when a reading was recorded. When the line was completed, the next line was run and the coordinates updated. The survey was performed by progressing back and forth along each line. The 200-foot rope was moved after every third line (every 15 feet) so that it could be used as a continual guide for position locations. Field notes of the site were also made which included the general location of the grid and any possible magnetic interferences encountered during the survey.

In addition, a preliminary magnetic survey was conducted in the area just south of the roadway. Magnetometer readings were taken and recorded but are not presented in Figure 1. No magnetic objects were detected in this area.

Once the survey was completed, all pin flags were removed except those positioned on the northern and eastern edges of the site. These were left in the ground to aid in locating any magnetic anomalies presented in this report.

DATA REDUCTION

The data stored in the equipment's memory were transferred to a portable computer in the field. Upon return from the site, the data file was then transferred to the mainframe computer. The data were then checked and data suspected to be influenced by cultural interference were deleted. In this case, the only interference appeared to be caused by the metal debris in the northeastern portion of the site (Figure 1). Using the data base of magnetic gradient data points, the computer develops the appropriate contours which are then plotted for subsequent interpretation.

CONCLUSIONS

Based on the magnetic gradient map (Figure 1), it is evident that ferromagnetic materials are buried on parts of the site.

The most extensive anomaly (Anomaly A) has a northwest to southeast trend and extends throughout the center of the site. The width of this anomaly (approximately 30 feet) and its irregular shape appear to preclude the presence of an underground pipeline. Instead, a trench with buried metals is more likely. The dashed line around Anomaly A indicates the approximate boundaries of this trench.

Four other, less-extensive anomalies (B through E) are also present on the site. It is not known what sort of buried metals caused these anomalies. The north portion of Anomaly D contains some very high gradient readings. Even though this area is influenced by the chain-link fence, it is believed that significant quantities of metal are buried below the surface.

Mr. Tass Varaklis

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April 15, 1987

One small anomaly in the northeastern portion of the site is believed to be due to the metal debris exposed in this area and is so noted in Figure 1.

As may be noted in the figure, there is also a very broad, regular anomaly in the western part of the site, with a gradient value of over 150 gammas. Without more information concerning the geology of the area, it is not possible to determine the reason for this anomaly. A possible cultural reason for this anomaly is a very wide area of shallow, buried metal debris. On the other hand, if natural phenomena are postulated, they may indicate the presence of an igneous dike or sill or glacial outwash, all of which contain magnetite-rich rocks.

A major portion of the site showed higher than normal background readings. Generally, in the gradient mode, zero values are observed in a typical site free from magnetite-rich rock. The higher readings are believed to be due to the presence of the magnetite-rich rocks in the area. These elevated background readings do not appear, however, to have masked any of the stronger magnetic anomalies. A few higher than normal readings were recorded along the northwestern edge of the chain-link fence, but these are believed to be due to the fence proximity. They are not thought to be indications of buried metal.

The portion of the site south of the plant driveway showed generally low readings ranging from absolute values of 0.3 to 99 gammas. These readings were within the range of background levels typical of this site and, therefore, did not indicate the presence of any magnetic anomalies.

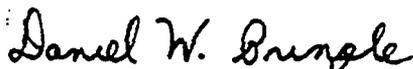
SUMMARY

It is obvious from this survey that ferrometallic objects are buried on site. It cannot be determined how much, what type, or at what depth metal objects are buried. A 30-foot-wide, 140-foot-long anomaly was discovered along with other smaller areas within the survey area. The cause of the broad, regular anomaly in the western part of the site cannot be determined without detailed geologic information about the area.

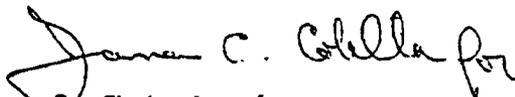
We appreciated the opportunity to conduct this magnetometer survey for RTI and hope we can be of assistance in the future.

If you have any questions, please do not hesitate to call.

Sincerely,



D. W. Pringle
Project Leader



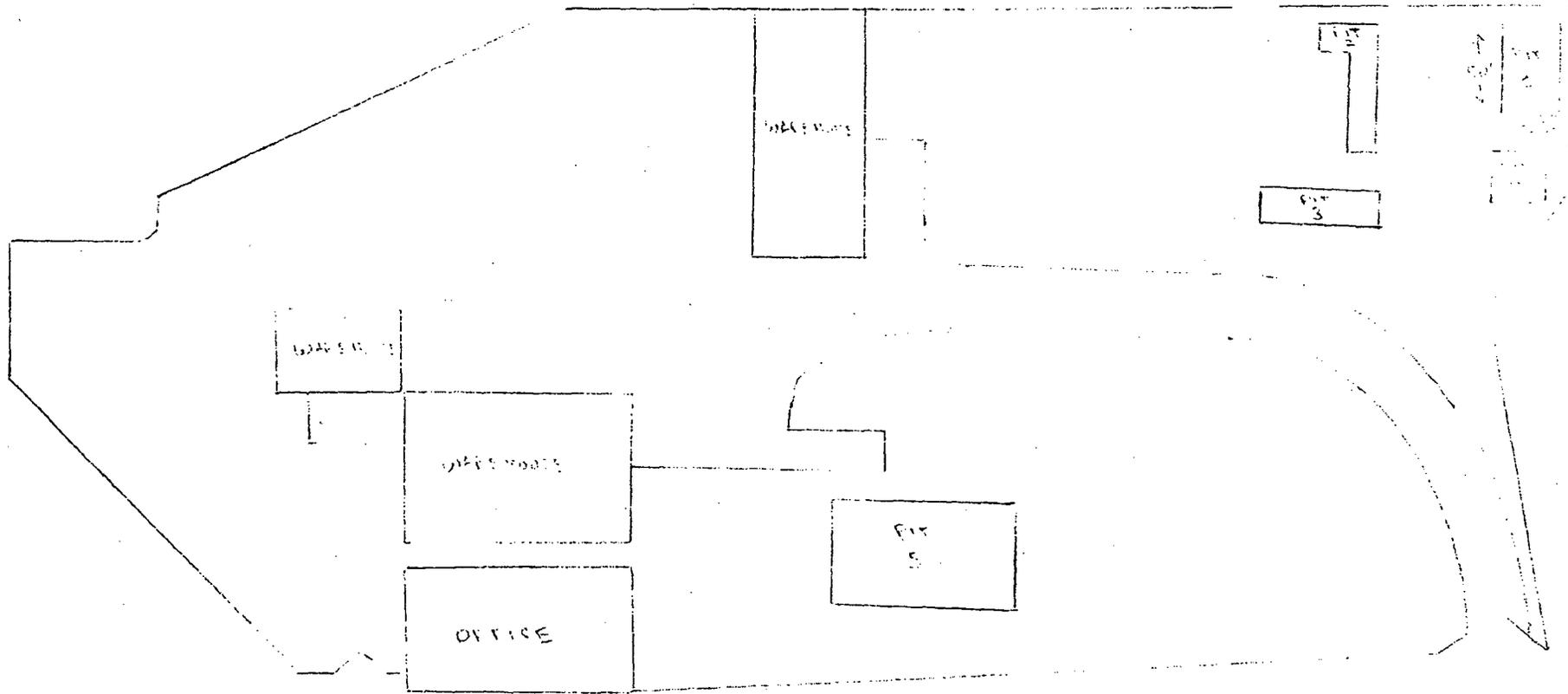
S. Chakrabarti
Project Manager

DWP:SC:tkk

cc: Dr. Robert Cockrell

Attachment B

NORTH



Approximate floor plan - 1987 annotations

MAY 02 1991

Docket No. 030-07022

License No. 29-13613-02

Process Technology North Jersey
ATTN: John D. Schlecht
Radiation Safety Officer
108 Lake Denmark Road
Rockaway, New Jersey 07866

Dear Mr. Schlecht:

We have performed a detailed review of your letter dated January 3, 1991 submitting the results of the remediation of contaminated areas at your site and the survey results submitted in the following letters with attachments:

August 30, 1990	site remediation update
July 16, 1990	site remediation update
July 6, 1989	site remediation plans
May 1, 1989	site characterization results; remediation plans
March 20, 1989	waste disposal schedule
December 14, 1988	site characterization and soil sample results
September 17, 1987	monthly progress report
August 3, 1987	monthly progress report
June 12, 1987	monthly progress report
May 12, 1987	remediation action plan schedule; survey results
April 3, 1987	survey results; remediation action plan

In order to reduce the amount of cobalt-60 contaminated material listed in Item 6.E of License No. 29-13613-02, a formal request to amend your license is required. You should request that this item be modified to an amount just sufficient for possession of all cobalt-60 contaminated material remaining on site after disposal of soil and debris from remediation activities. Please submit a request to amend your license in a letter, and include the following additional information:

1. Please describe the method used to calibrate the instruments used in the surveys performed during remediation activities. Include a description of the source used in the calibration, and any correction factors used. Please describe the methods used to verify correct operation of the survey meters daily during remediation activities.
2. For Areas A, B, C and D in your letter dated January 3, 1991, please state the depth of soil removed. Please describe the method used to dispose of the contaminated soil, and the total quantity of material disposed.
3. Please state whether the radiation levels presented in the January 3, 1991 letter were measured before soil was removed, after soil was removed, or after the areas were backfilled.

45-14

Control No. 114377

4. In Section 2.1 of the document, "Evaluation of Options for Analysis of Soil and for Remediation of Cobalt-60 Contaminated Soil," you state that there is poor correlation between the measured activity of cobalt-60 in soil samples and the gamma flux data collected during the site characterization survey performed by Chem Nuclear, Incorporated.
 - a) Please provide any data demonstrating the correlation between the cobalt-60 concentration in soil and your radiation level measurements performed with a micro R meter.
 - b) Section 3.6 describes the basis for using radiation level surveys to identify soil containing cobalt-60 contamination in concentrations greater than 8 picocuries per gram. It assumes any soil contamination results from a surface spill. However, radioactive waste material was found buried as much as six feet below the surface. Please submit results of surveys and sampling performed to determine if contaminated soil or material is buried below uncontaminated soil. If radiation level surveys are used to identify buried contaminated material, state the assumptions and calculations used to determine the radiation levels that indicate buried contaminated material exceeding the release criteria.
 - c) Please state your basis for believing that no contamination exists at depths greater than 30 centimeters, given that no soil sampling, other than one bore sample in Area A, was performed at greater depths.
5. Please describe your procedure for performing radiation level measurements. Describe how grids were established for each area, the location of survey points within each grid, and the method use to assure uniform height for each measurement.
6. Your letter dated December 14, 1988 included maps showing the location and results of soil samples taken in the creek bed prior to remediation of the area. Your letter dated January 3, 1991 submits a grid for radiation levels in Area C (the drainage ditch) after remediation. However, this grid shows no indication of direction and neither letter shows any method of determining the location from a fixed reference point. Please submit information which describes the location of the area remediated. Indicate distances to the site fence, and to Lake Denmark.
7. Your letter dated March 20, 1989 states that you will remove the three "hot spots" located north of the fence as characterized in your December 14, 1988 submission. However, the December 14, 1988 letter does not list three hot spots. Please describe the areas of the hot spots and submit any additional information to show that these hot spots now meet the release criteria.

8. Please state whether samples from the wells have been analyzed during the period of 1988 through 1990. Submit a description of any analyses performed, and results of these analyses. In your letter dated July 16, 1990, you state that quarterly samples will be taken from monitoring wells, and analyzed to determine if radioactive contamination was migrating from the site. Please submit the results of these analyses.
9. In your letter dated July 6, 1989, you stated that you would seek permission from the NJDEP to test a downstream well for radiological contamination. Please state whether you completed this action, and submit any results of this sampling.
10. Please state whether any sampling of water or sediment from Lake Denmark was performed. If so, please describe the methods used to collect and analyze the samples. If not, please describe your basis for believing that runoff from the PTI site through the drainage ditch (Area C) has not caused contamination of the lake and/or sediment.
11. Your letters dated April 3, 1987; June 10, 1987; August 3, 1987; and September 17, 1987 list materials removed from Pit Nos. 1 through 5.
 - a. Please confirm that these letters list the complete inventory of radioactive waste found in each pit. If not, please submit any additional information.
 - b. Please show the location of each pit on a diagram of the site, and compare the locations to those of Areas A and B described in your January 3, 1991 letter.
 - c. Please submit copies of the waste manifests for the disposal of this material.
12. Please submit a site diagram which shows the location of all areas where trenches were dug. Indicate from which trenches radioactive waste was removed. State the depth at which waste was discovered, and the total depth of each trench.
13. Please submit the results of any radiological surveys performed of the trench areas. State if the surveys were performed before digging, after digging, or after backfill of the trench area. Submit the results of analyses of any soil samples taken from the trench areas.
14. In your letter dated July 6, 1989 you stated that you would prepare a summary of events related to the burial of material and subsequent removal in the northeast corner of your fenced site. We have not yet received this summary. Please submit this information.

15. Item No. 3 of our letter dated May 16, 1990, requests that you 1) estimate the potential for any other buried radiological waste in the northeast corner of your site and 2) provide an evaluation of whether any remaining material can be located and removed.
 - a. In your letter dated July 16, 1990 you stated that "initial survey results indicate no further buried radioactive material in the area". Please describe the surveys, and submit the results on which you base your conclusion that no other material is buried.
 - b. You also state in the July 16, 1990 letter that core samples will be performed to confirm that no additional buried material exists. However, your letter dated January 8, 1991 states that only one core sample was performed, and that this sample was taken from Area A, a location where buried radioactive material was found. In addition, the sample depth was apparently only 37 inches, and buried material was found at depths up to six feet. Please submit a plan for performing core sampling of the area.
16. Please indicate the location of the bore sample taken in Area A. Please describe the method used to take the bore sample, the depth of the bore hole, and the method used to analyze soil from the bore hole. Describe any treatment of the soil prior to analysis. State the results of any gamma log survey of the borehole, and describe the instrument used for gamma logging.
17. Core sample results dated August 24, 1990 submitted in your letter dated January 31, 1991, are reported in picocuries per milliliter (pCi/ml) of soil, with a handwritten column showing results in picocuries per gram (pCi/g). Please state the assumptions made to convert your results to pCi/g in order to compare the results to the release criteria in pCi/g.
18. Please submit an estimate of the amount of soil remaining on your site which exceeds 8 picocuries of cobalt-60 per gram of soil. As has been discussed with you previously, this is the limit which NRC plans to use for release of soil for unrestricted use. State any assumptions and calculations used to determine the total quantity of cobalt-60 in contaminated soil on site.
19. Please submit a summary of activities performed to characterize contamination due to hazardous materials on your site. Describe any current or planned sampling and remediation activities for hazardous material.

As you are aware, Messrs. Knapp and Arlotto of this office will be visiting your site on Friday, May 10, 1991 and are available to discuss these issues, and the timing of future actions. NRC senior management is placing additional importance on the completion of licensee and NRC action on contaminated sites or areas. Therefore, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By:

John D. Kinneman

John D. Kinneman, Chief
Nuclear Materials Safety Section B
Division of Radiation Safety
and Safeguards

030-07022

Process Technology North Jersey

Subsidiary of RTI Inc.

108 LAKE DENMARK ROAD, ROCKAWAY, NJ 07866
(201) 625-8400 • FAX: (201) 625-7820

March 11, 1991

Mr. Paul Swetland
Nuclear Material Safety Section C
Division of Radiation Safety and Safeguards
US Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

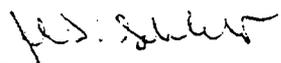
License No. 29-13613-02
Docket No. 030-07022
Control No. 112009

Dear Mr. Swetland:

We request an amendment to our license No. 29-13613-02 to remove Item 6G (Co-60 10 mCi contamination, any form). All contaminated items have been removed from the North Jersey Process Technology facility. Enclosed please find our check for \$370 to cover this amendment.

If you have any further questions or comments, please contact me.

Sincerely,


John D. Schlecht
Radiation Safety Officer

JDS:jk
Enclosure

RECEIVED-REGION I
91 MAR 14 P2:55

114311

MAR 14 1991

PROCESS TECHNOLOGY OF NORTH JERSEY, INC.

TO: U.S. Nuclear Regulatory Commission

REF. NO.	YOUR INVOICE NO.	INVOICE DATE	INVOICE AMOUNT	AMOUNT PAID	DISCOUNT TAKEN	NET CHECK AMOUNT
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PROCESS TECHNOLOGY OF NORTH JERSEY, INC.
108 LAKE DENMARK RD.
ROCKAWAY, NJ 07866

**NATIONAL COMMUNITY BANK
OF NEW JERSEY** 3985
ROCKAWAY, NJ 07866 55-271/212
CHECK NO. CHECK DATE VENDOR NO.
3985 03/12/91

THREE HUNDRED SEVENTY & 00/100

CHECK AMOUNT
\$*****370.00

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THE
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U.S. Nuclear Regulatory Commission

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[Redacted Signature Box]

R.S. Mans

EX. 4

Process Technology North Jersey

Subsidiary of RTI Inc.

108 LAKE DENMARK ROAD, ROCKAWAY, NJ 07866

(201) 625-8400 • FAX: (201) 625-7820

June 3, 1991

Mr. John D. Kinneman, Chief
Nuclear Materials Safety Section B
Division of Radiation Safety and
Safeguards
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

License No. 29-13613-02

Docket No. 030-07022

Dear Mr. Kinneman:

In response to your letter dated May 2, 1991 we are submitting the following. As agreed with Mr. Paul Swetland of your office, the responses to 13 of the 19 items are enclosed. The responses to the remaining 6 items will be forwarded to your office by July 9, 1991.

1. A Ludlum Model 19 Micro R survey meter was used in the surveys performed during remediation activities. The survey instrument was calibrated by Radiation Management Consultants. Calibration methods are traceable to National Bureau of Standards. Corrections are made to 22 degree C and 760 mm Hg. No energy dependent correction factors were necessary for measuring dose rate from CO-60. Proper operation of the survey meter was verified using a check source daily prior to remediation activities.
2. In Area "A" approximately 12" of soil was removed beyond the initial excavation which existed prior to remediation. In Area "B" only one spot approximately 2' square was excavated to a depth of approximately 12". In Area "C" excavation was performed in the 3 "hot spots" which will be further identified in response to Item 7. These areas were excavated to a depth of approximately 12". Area "D" required the most extensive remediation. Soil in Area "D" was removed from a depth varying from 4" to 18". The amount of soil excavated varied according to survey results during remediation activities. Thirty-six drums of contaminated soil were removed from Area "D". All soil removed during remediation activities was disposed under manifest #0291-138 by Chem Nuclear Systems, Inc.
3. All survey results presented in the January 3, 1991 letter were measured after soil was removed. All readings include background which was approximately 5 ur/hr for all four areas. Only Area "D" required backfilling. Readings in Area "D" are after soil was removed but prior to backfilling.

M516

14377

Page two

June 3, 1991

Mr. John D. Kinneman, Chief

4. Response to be submitted by July 9, 1991.
5. Grids were established on a 10'square basis. Survey points were at each corner of the grid, the approximate center of each grid and a general sweep of each grid. Uniform height was assured using a meter stick.
6. A new sketch of Area "C" is enclosed as Attachment A, indicating the location of the site fence as a reference point. Lake Denmark is located approximately 100' Northwest of the point identified as "Railroad Bed". The site fence is the eastern boundary of this area.
7. The approximate locations of the "Hot Spots" are designated as A, B and C on Attachment A. All surveys in Area "C" were submitted on January 3, 1991 and these surveys indicate that all soil in Area "C" (including the hot spots) meet the 15 pCi/g criteria.
8. In our July 16, 1990 letter we stated the following: "To confirm that there is no additional buried material we will take core samples. If results are negative remediation in this area should be complete by August 31, 1990. If results are positive we will submit by September 30, 1990 a comprehensive plan for remediation in this area. Present plans include monitoring existing wells at quarterly intervals...". Please note that the intent of this was to monitor wells if there was any indication of additional buried radioactive material. We have not performed any well monitoring due to the fact that investigation of this area revealed no additional buried radioactive material.
9. As with item 8, well monitoring was only being considered if investigation revealed additional buried radioactive material. No monitoring of DEP wells has been performed.
10. Samples of both water and sediment were taken of Lake Denmark. Water samples indicated no measurable activity. Sludge sampling detected small amounts of activity at the base of the creekbed. The highest contamination level was found to be 6 pci/g.
11. Response to be submitted by July 9, 1991.
12. Response to be submitted by July 9, 1991.
13. Response to be submitted by July 9, 1991.
14. Response to be submitted by July 9, 1991.

Page three
June 3, 1991
Mr. John D. Kinneman

15. Response to be submitted by July 9, 1991.
16. The bore sample taken in Area "A" was located at the approximate center of the area marked "excavation site" on the Area "A" map. This was the location with the highest readings in Area "A". The bore sample was taken by driving a 1 1/2" diameter pipe into the ground to a depth of approximately 37". This core sample was taken in an area that had previously been excavated to a depth of approximately 18". The total core depth was in excess of 5 feet. The pipe was then split open and soil samples were taken of every 2" of the core. These soil samples indicated that the contamination level dropped below 8 pCi/g at a depth of approximately 9". No buried items were contacted with the bore sample nor were any detected in the sampling. No gamma log survey was conducted at the bore hole nor was any discussed in our July 16, 1990 submittal.
17. All soil samples taken by RTI Inc. were weighed with a calibrated balance prior to assay. Soil samples were collected and assayed in 100 ml containers. The test source used in calibrating the counter scaler used to assay the samples was also in the same 100 ml configuration. The test source has a specific gravity of approximately 1.0. All readings were converted from pCi/ml to pCi/g according to sample weight. For example: A 50g soil sample which assayed to 8 pCi/ml would covert to 16 pCi/g.
18. As discussed in our January 3, 1991 submittal, only areas "A" and "D" still contain contamination levels in excess of 8 pCi/g. These two areas have been remediated to 15 pCi/g. Both of these areas are within the protected area of the property. A worst case assumption of uniform 15pCi/g contamination to a depth of 1' would yield a total quantity of CO-60 contamination of approximately 0.69 mCi. It is assumed that approximately 1 gram of soil occupies 1 cm³ of space for the above calculation.
19. Summary of NJDEP superfund activities.

The RTI site in Rockaway Township is being investigated by the New Jersey Department of Environmental Protection (NJDEP) to determine the extent of groundwater contamination.

The investigation to date has consisted of two phases. Phase I concentrated on the 15 acre site that Process Technology of North Jersey is on. Phase II extended the area to include an additional 65 acres owned by RTI Inc.

Page four
June 3, 1991
Mr. John D. Kinneman, Chief

Phase II was completed in the fall of 1990. RTI was able to obtain a copy of a draft report relating to Phase I but the NJDEP has not yet issued a final report for the entire study.

Enclosed as Attachment B is a review of the NJDEP Phase I remedial investigation report and our recommendations on Phase II, prepared by HydroQual, Inc., a consultant for RTI Inc. The NJDEP has declined to provide us with any information regarding the results of Phase II other than raw data. It is our understanding that they are still reviewing the data. To our knowledge no remediation plan has yet been proposed.

Very truly yours,

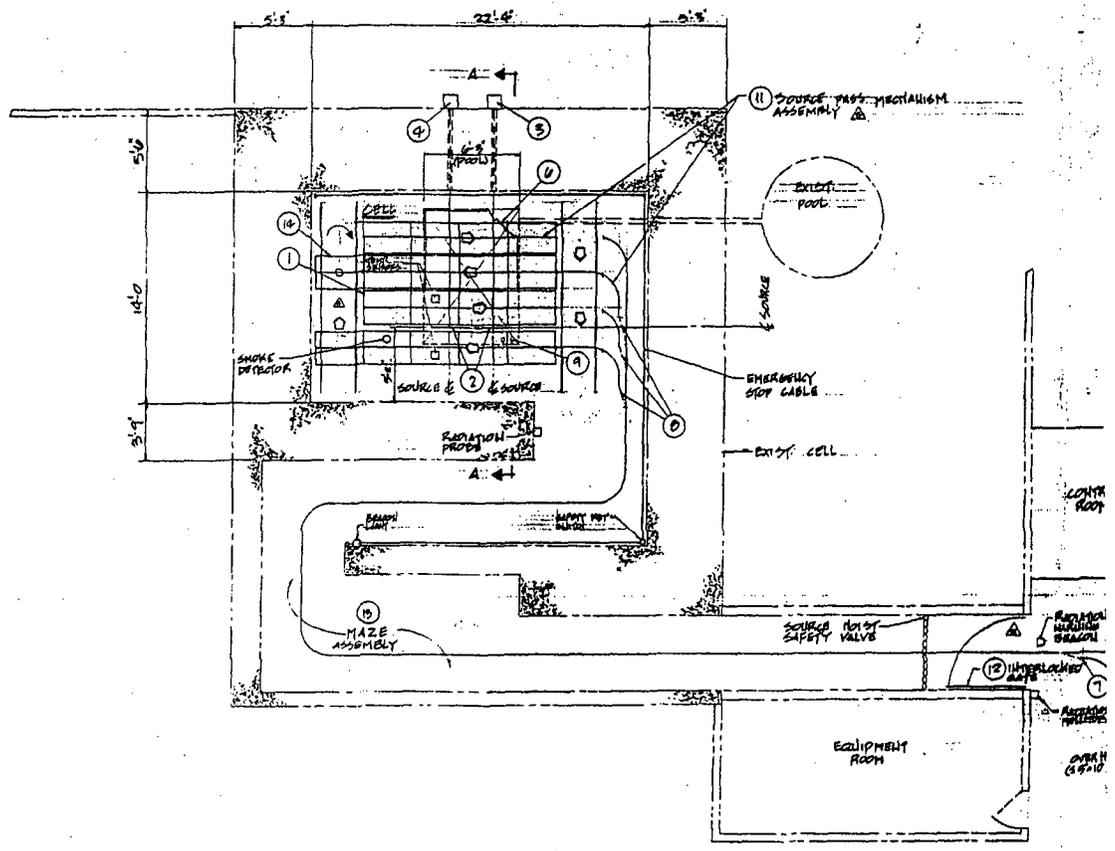


John D. Schlecht
Plant Manager and RSO

JDS:jk
Attachments (2)

02.01.02

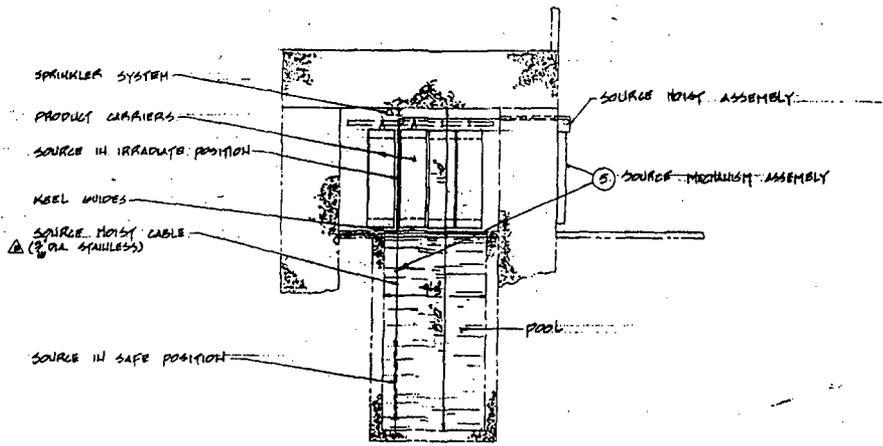
PROCESSED PRODUCT STORAGE AREA



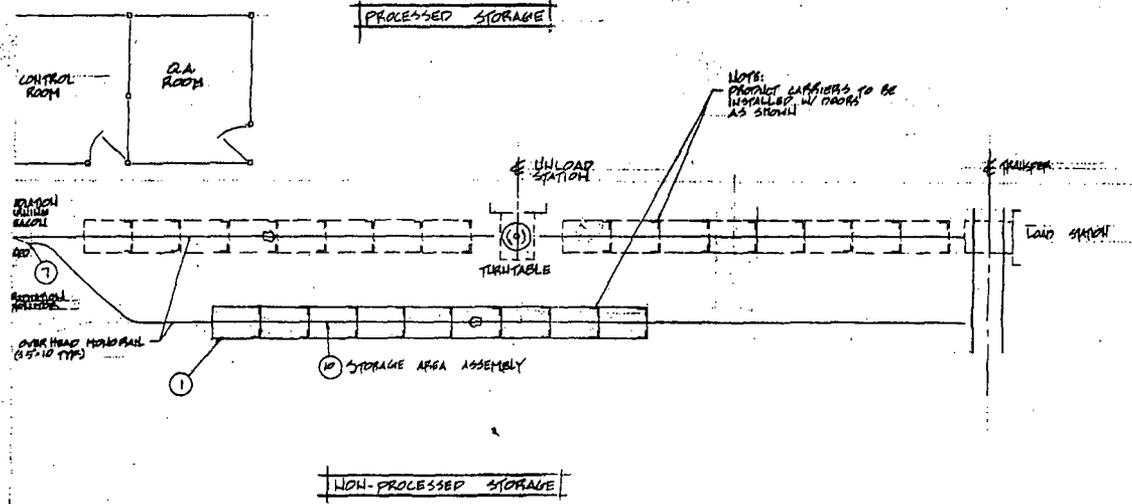
PLAN
SCALE 1/8" = 1'-0"

NOTES:

1. CARRIER COMPARTMENT INSIDE DIMENSIONS - 2'
2. PRODUCT STACK DIMENSIONS - 29" WIDE x 29" H
3. BIOLOGICAL SHIELD DESIGNED FOR 10⁶ MILLICUR
4. VENTILATION REQ'D AT THE RATE OF 2200 C.F.M.
5. CONDUCTIVITY OF POOL WATER MUST BE LESS THAN 100 MICROMHO/CM
6. THE BIOLOGICAL SHIELD IS DESIGNED TO REDUCE LEVELS WITH SOURCES OF 5 MILLICUR/HR TO AREAS ADJACENT TO THE SHIELD PROVIDED THE AVERAGE EXPOSURE RATE OVER A SURFACE IS LESS THAN 0.25 MR/HR



SECTION-AA
SCALE: 1/4"



1045 - 25 1/2 W x 97 L x 88 H.
 1000 W. CARBON.
 2200 GPM.
 LESS THAN 10 MICROSIEMENS/CM
 REDUCE THE EXTERNAL RADIATION LEAKAGE
 RATES OF ABOUT 40 TO AN AVERAGE SURFACE RADIATION
 RATES OF UP TO 2 MR/HR ARE ALLOWABLE IN SMALL
 TO THESE CONTRIBUTIONS DO NOT RAISE THE
 RATE ABOVE 0.15 MR/HR.

BILL OF MATERIAL

ITEM	QTY	DRAWING	DESCRIPTION
1	1	000	CARRIER ASSEMBLY
2	2	000	SOURCE HOIST ASSEMBLY
3	1	000	HOIST ASSEMBLY
4	1	000	KEEL ASSEMBLY
5	1	000	SOURCE MECHANISM ASSEMBLY
6	1	000	POOL COVER
7	1	000	RAIL SWITCH (RIGHT)
8	1	000	RAIL SWITCH (LEFT)
9	1		WATER LEVEL SWITCH ASSEMBLY
10	1	100	STORAGE AREA ASSEMBLY
11	1	100	SOURCE HOIST MECHANISM ASSEMBLY
12	1	100	UNLOADING RAILS
13	1	100	WHEEL ASSEMBLY
14	1	000	TURNABLE ASSEMBLY

DATE	CHECKED	BY	SCALE
1/15/68			1/4"
2. LISTED PARTS, TURNABLE ASSEMBLY	DATE	BY	
3. CHECKED BY	DATE	BY	
4. CHECKED BY	DATE	BY	

RADIATION PROTECTION
 ROCKWELL, INC.
 BATCH IRRADIATOR
 ROCKWELL, INC.
 SHEET NO. RT1010110