UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

8

37-00030-02

AUG 27 1980

Docket No. 30-5980

United States Radium Corporation
ATTN: Mr. J. Miller
Manager, Nuclear Operations
4150 Old Berwick Road
Bloomsburg, Pennsylvania 17815

Gentlemen:

Subject: Inspection No. 30-5980/80-02

This refers to the special inspection conducted by Messrs. F. Costello and J. Kinneman and Miss P. Verbryke of this office on July 18 and 22, 1980 of activities authorized by NRC License No. 37-00030-02 and to the discussions of our findings held by Mr. F. Costello with yourself and other members of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractor) believe to be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must be accompanied by an affidavit executed by the owner of the information, which identifies the document or part sought to be withheld, and which contains a statement of reasons which addresses with specificity the items which will be considered by the Commission as listed in subparagraph (b) (4) of Section 2.790. The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

XIX-043c

No reply to this letter is required; however, should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

John D. Kinneman, Chief
Materials Radiological Protection
Section

Enclosure: Office of Inspection and Enforcement Inspection
Report Number 30-5980/80-02

bcc w/encl:
IE Mail & Files (For Appropriate Distribution)
Central Files
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
REG:I Reading Room
Commonwealth of Pennsylvania
License Fee Management Branch

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION I

Report No. 30-5980/80-02

Docket No. 30-5980

License No. 37-00030-02 Priority I Category E

Licensee: United States Radium Corporation
4150 Old Berwick Road
Bloomsburg, Pennsylania 17815

Facility Name: United States Radium Corporation

Inspection At: Bloomsburg, Pennsylvania

Inspection Conducted: July 18 and 22, 1980

Inspectors: F. Costello, Radiation Specialist — 8/25/80 date

P. Verbryke, Engineering Aide (Co-op) — 8/25/80 date

Approved by: John D. Kinneman, Chief, Materials Radiological Protection Section, FF&MS Branch — 8-27-80 date

Inspection Summary:

Inspection on April 11, 1980 Combined Report Number 30-5980/80-01; and 30-5982/80-01

Areas Inspected: Special, unannounced inspection including environmental monitoring and independent measurements. The inspection involved 20 inspector-hours on site by three NRC inspectors.

Results: Of the two areas inspected, no items of noncompliance were identified.

DETAILS

1. Persons Contacted

*Mr. J. Miller, Manager, Nuclear Operations
*Dr. J. MacHutchin, Radiation Safety Officer
*Mr. G. Good, Foreman, Health and Safety/Quality Control
*Mr. C. Berlin, Group Leader, Health and Safety/Quality Control
*Mr. J. Watts, Technical Manager

*Indicates those present during the exit interview.

2. Environmental Monitoring

The inspectors reviewed the results of the licensee's recent bore water sample analyses. They noted that the results indicated that concentrations in excess of 10 CFR 20, Appendix B, Table II Column 2 limits had been detected in water from bore 20, a four (4) foot deep hole on an adjacent property. Other samples, taken from bore holes on the licensee's property, also indicated concentrations in excess of these limits. The analyses were made for gross alpha and gross beta concentrations. The licensee, based on previous analyses, assumes that gross alpha measurements indicate radium-226 activity and that gross beta measurements indicate strontium-90 activity. Those results which indicated concentrations in excess of these limits are listed in Attachment 1 to this report. The locations of the licensee's bore hole sampling stations are shown in Attachment 2 to this report.

The licensee plans to expand its environmental monitoring program and will submit a program describing its plans in the near future.

3. Independent Measurements

The inspectors obtained a sample of the potable drinking water from a well from the adjacent property referred to above. The analysis, described in Attachment 3 to this report, indicated a concentration of 7×10^{-10} microcuries per milliliter of gross alpha activity and 3.9×10^{-9} microcuries per milliliter of gross beta activity. Both of the measurements indicated concentrations well within 10 CFR 20, Appendix B,Table II, Column 2 limits.

The inspectors also sent a sample of water from bore 20 to the Idaho Operations Office of the U.S. Department of Energy for analysis. The analysis, indicated a concentration of 8×10^{-10} microcuries per milliliter of gross alpha activity and 4.9×10^{-8} microcuries per milliliter of gross beta activitity. Both of the measurements indicated concentrations well within 10 CFR 20, Appendix B, Table II, Column 2 limits.

The inspectors replaced the thermoluminescent dosimeters (TLD) which had been located along the licensee's perimeter at the time of the last inspection and placed an additional TLD on the back porch of the residence whose property includes bore 20. The exposed TLDs were returned to the Regional Office. The results will be reported upon completion of system calibration.

The inspectors also obtained drinking water samples from nearby residents which were analyzed by the Idaho Operations Office of the U.S. Department of Energy. The analyses, included as Attachment 4 to this report, indicated concentrations well within 10 CFR 20, Appendix B, Table II, Column 2 limits.

4. Exit Interview

Mr. John Kinneman, Chief, Materials Radiological Protection Section, and the inspector met with licensee representatives denoted in paragraph 1 at the conclusion of the inspection on July 23, 1980. Mr. Kinneman advised the licensee of the necessity for prompt action in preparing a plan for environmental monitoring and decontamination of the facility. Licensee representatives stated that they would shortly meet with their consultant and would formulate their environmental monitoring and decontamination plans in a couple of months based on the consultant's recommendations.

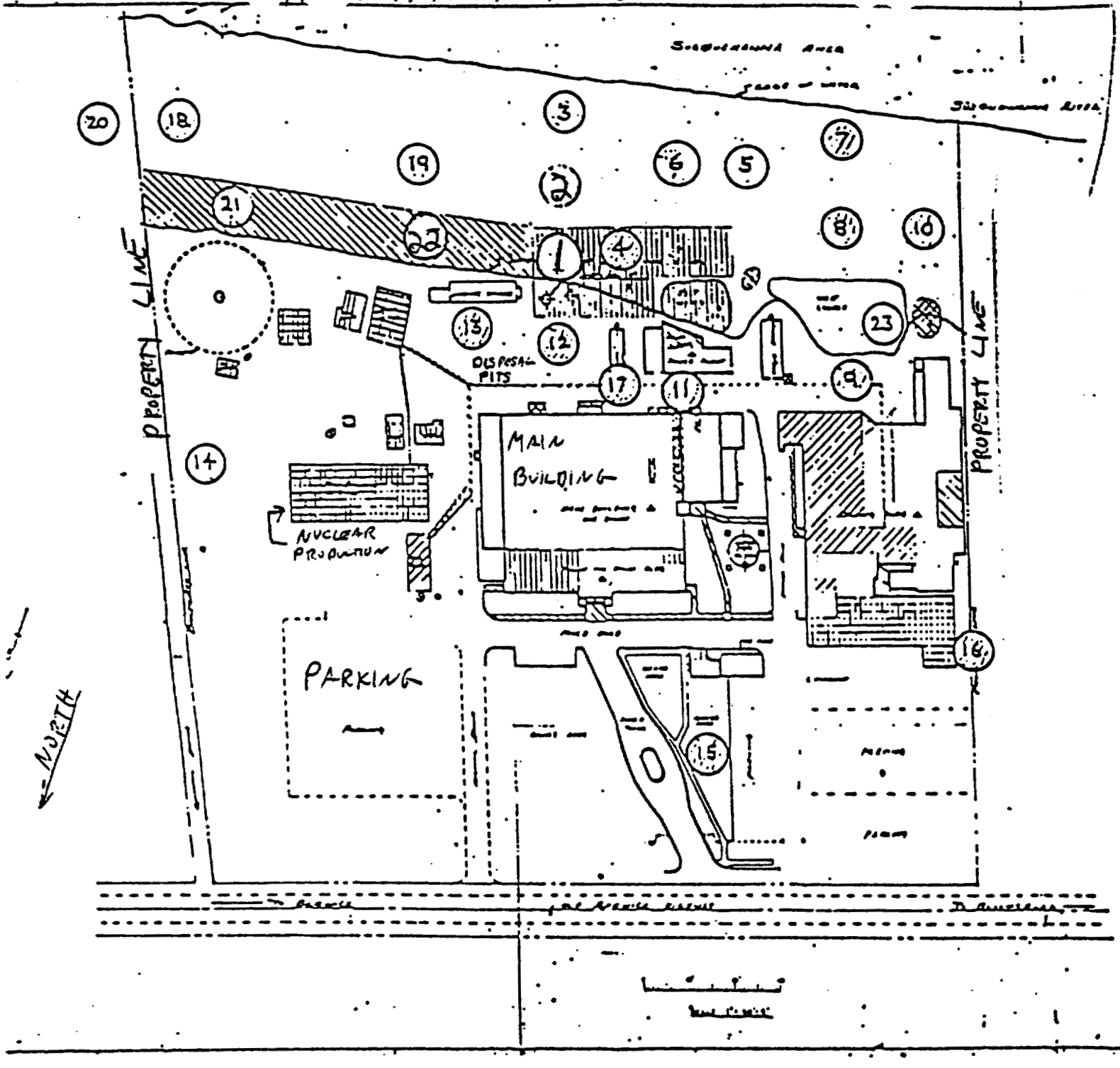
ATTACHMENT 1

SUMMARY OF H_2O ACTIVITY LEVELS > MPC

(Based on most recent analyses)

Bore No.	Most Recent Analysis Date	Gross α (microcuries/milliter)	Gross β (microcuries/milliliter)
1	6/11/80	$< 2.28 \times 10^{-9}$	6.89×10^{-5}
2	6/11/80	$< 1.64 \times 10^{-9}$	4.12×10^{-5}
3	6/11/80	$< 1.13 \times 10^{-9}$	4.43×10^{-6}
5	4/8/80	3.2×10^{-8}	2.48×10^{-8}
6	6/16/80	3.2×10^{-8}	8.48×10^{-7}
19	6/11/80	1.10×10^{-8}	3.73×10^{-7}
20	4/8/80	1.46×10^{-6}	1.84×10^{-6}
21	4/8/80	5.07×10^{-7}	3.25×10^{-6}
22	4/8/80	5.91×10^{-5}	8.35×10^{-5}
23	1/28/80	6.45×10^{-8}	1.08×10^{-7}
10 CFR 20, Appendix B, Table II, Column 2		3×10^{-8} (Ra-226)	3×10^{-7} (Sr-90)

ATTACHMENT 2



LOCATIONS OF BORE SAMPLING STATIONS

U.S. RADIUM CORPORATION

ATTACHMENT 3

ANALYSIS OF WELL WATER FOR GROSS ALPHA AND BETA ACTIVITY

400 milliliters of water was evaporated to dryness and counted for 900 minutes for alpha and beta activity at the Region I laboratory using a Tenacles LB 1,000 Low Background Counting System.

Data

Gross Alpha Count = 172 (Background = 0.043 cpm)
Gross Beta Count = 3,184 (Background = 2.53 cpm)
Alpha Efficiency = 27.8%
Beta Efficiency = 29.3%
Thickness of Sample = 4.1 mg/cm^2
Absorption Correction Factor = 1.1 (From HASL Procedure E-RA-02-07, Figure 1)

$$\text{Gross Concentration} = \frac{(\text{Net Counts})(\text{Absorption Correction Factor})}{(\text{Volume})(\text{Efficiency})(\text{Count Time})(2.2 \times 10^6 \text{ dpm/microcurie})}$$

Gross Alpha Concentration = $(7 \pm 2) \times 10^{-10}$ microcuries/milliliter

Gross Beta Concentration = $(3.9 \pm 0.9) \times 10^{-9}$ microcuries/milliliter

ATTACHMENT 4

SUMMARY OF NEARBY RESIDENT'S DRINKING WATER (ALL RESULTS IN MICROCURIES/MILLILITER)

	Gross Alpha	Gross Beta	Tritium
Resident 1	$(0 \pm 3) \times 10^{-10}$	$(5 \pm 2) \times 10^{-9}$	$(2.7 \pm 0.2) \times 10^{-6}$
Resident 2	$(3 \pm 2) \times 10^{-10}$	$(5 \pm 2) \times 10^{-9}$	$(2.7 \pm 0.2) \times 10^{-6}$
Resident 3	$(1 \pm 2) \times 10^{-10}$	$(6 \pm 2) \times 10^{-9}$	$(2.0 \pm 0.2) \times 10^{-6}$
Resident 4	$(1 \pm 2) \times 10^{-10}$	$(8 \pm 2) \times 10^{-9}$	$(1.8 \pm 0.2) \times 10^{-6}$
Bloomsburg Town Water	$(1 \pm 3) \times 10^{-10}$	$(6 \pm 2) \times 10^{-9}$	$(0.0 \pm 0.2) \times 10^{-6}$

Analysis performed by the Idaho Operations Office of the U. S. Department of Energy.