

Enclosure A Region I Report  
40-3296/82-01 - 40-2308/82-01

MARTIN MARIETTA AEROSPACE

BALTIMORE DIVISION  
103 CHESAPEAKE PARK PLAZA  
BALTIMORE, MARYLAND 21220  
TELEPHONE (301) 338-5000

June 1, 1982

Ms. Jenny Johansen  
USNRC  
Region 1  
631 Park Avenue  
King of Prussia, Pa. 19406

Dear Ms. Johansen:

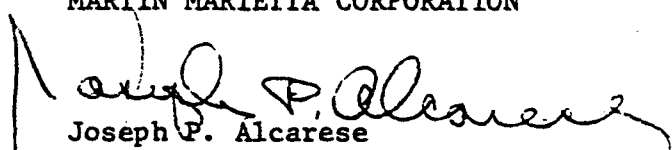
In accordance with your request, I am enclosing, from the records of the Martin Marietta Corporation, a copy of the "Comprehensive Radioactive Survey Report For The Release of Decontaminated Premises For Unrestricted Use", prepared in accordance with U.S.A.E.C. Material License No. SNM-1192 issued to the Martin Marietta Corporation for the decontamination of nuclear laboratories at Baltimore, Maryland.

I am also enclosing a copy of correspondence showing that the Survey Report was furnished to the AEC Division of Materials Licensing at Washington, D.C. and the AEC Compliance Division at Newark, New Jersey. Also, a copy of a letter to the AEC Division of Materials Licensing advising that the decontamination program was near complete and requesting an inspection of the facility.

We are pleased to be able to assist you in this matter.

Very truly yours,

MARTIN MARIETTA CORPORATION

  
Joseph P. Alcarese  
Division Counsel  
Martin Marietta Aerospace  
Baltimore Division

JPA:jd  
enclosures

A/284

15 July 1970

Mr. Donald A. Nussbaumer, Chief  
Fuel Fabrication and Transportation Branch  
Division of Materials Licensing  
United States Atomic Energy Commission  
Washington, D.C. 20545

Dear Mr. Nussbaumer:

Please be advised that the decontamination program at the Martin Marietta Corporation Baltimore facilities is nearing completion and it is anticipated the program shall be completed tentatively on August 5, 1970.

We request that an inspection of the subject facility be conducted on August 6, 1970, by a representative of your office in conjunction with the writer and a health physicist from the Eberline Instrument Corporation. If the above date is not compatible with your assignee's schedule and if there are questions regarding the above request and/or program, please advise the writer.

I wish to express my corporation's thanks and appreciation for the excellent service provided by representatives of your office toward bringing this program to a successful completion.

Sincerely yours,

MARTIN MARIETTA CORPORATION

Elmer M. Chenault  
Health Physicist

cc: G. W. Heineman ✓  
R. G. Macaulay  
J. Stewart  
F. F. Hunez  
R. Petrochko  
E. Geiger  
R. T. Woolsey

*Decontamination*

21 September 1970

Director of Division Compliance  
United States Atomic Energy Commission  
970 Broad Street  
Newark, New Jersey 07107

Attention: Mr. W. Lorenz

Gentlemen:

Enclosed is a comprehensive radiation survey report describing the successful decontamination of our laboratory facilities. The report is one of the requirements of the license (A.E.C. Material License No. SNM-1192) issued to the Martin Marietta Corporation, Baltimore Division, to allow decontamination of said facilities.

Sincerely,

Elmer M. Chanault  
Sr. Health Physicist

Encl.

cc: G. W. Heineman ✓  
R. G. Macaulay  
J. Stewart

22 September 1970

Director, Division of Materials Licensing  
United States Atomic Energy Commission  
Washington, D. C.

Attention: Mr. R. T. Woolsey

Gentlemen:

Enclosed is a comprehensive radiation survey report describing the successful decontamination of our laboratory facilities. The report is one of the requirements of the license (A.E.C. Material License No. ENM-1192) issued to the Martin Marietta Corporation, Baltimore Division, to allow decontamination of said facilities.

Sincerely,

Elmer M. Chenault  
Sr. Health Physicist

Encl.

cc: G. W. Heineman ✓  
R. G. Macaulay  
J. Stewart

COMPREHENSIVE RADIATION SURVEY REPORT  
FOR THE RELEASE OF  
DECONTAMINATED PREMISES FOR UNRESTRICTED USE

CHESAPEAKE PARK, INC., BALTIMORE, MARYLAND  
MARTIN MARIETTA CORPORATION  
BALTIMORE, MARYLAND

Prepared by

E. M. Chenault  
Sr. Health Physicist  
Martin Marietta Corporation

and

Stanley J. Waligora, Jr.  
Consultant Health Physicist  
Eberline Instrument Corporation  
Santa Fe, New Mexico

## CONTENTS

- I. INTRODUCTION
- II. LOCATION AND IDENTIFICATION OF FACILITIES
- III. HEALTH PHYSICS TECHNICAL APPROACH
- IV. SCOPE OF SURVEY AND GENERAL PROCEDURES FOLLOWED
- V. FINDINGS OF THE DECONTAMINATION SURVEY
- VI. PACKAGING, TRANSPORTATION AND DISPOSAL OF CONTAMINATED EQUIPMENT
- VII. APPENDICES
  - A. Health and Safety Procedure for the Decontamination of Building "D", Chesapeake Park, Inc., Baltimore, Maryland, Martin Marietta Corporation
  - B. Summary of Decontamination Operations
  - C. Sample Analysis Results
    - 1. Environmental Air Samples
    - 2. Environmental Water Samples
    - 3. Environmental Swipe and Soil Samples
    - 4. Bioassay Samples
      - a. Positive Nose Swipes
      - b. Urine Analysis

## I. INTRODUCTION

Purpose: This radiation survey report is prepared as one of the conditions provided for in U.S.A.E.C. Material License No. SNM-1192 issued to the Martin Marietta Corporation for the decontamination of nuclear laboratories at Baltimore, Maryland.

Since the subject nuclear laboratories are no longer used for radioisotopes operations and/or special nuclear materials processes and have been decontaminated in accordance with U.S.A.E.C. guidelines, it is requested the above named facilities be released for unrestricted use.

On June 3, 1970, the decontamination program at the Martin Marietta Corporation, Baltimore Division, commenced and it was completed on September 2, 1970. The radioactive materials involved in the decontamination program consisted primarily of  $U^{235}$  and  $U^{238}$  in a residual oxide form.

The work was performed by a crew consisting of 8 trained operators from the Martin Marietta Corporation, two health physicists from Eberline Instrument Corporation, and one health physicist from Martin Marietta Corporation. The removal of the radioactive material from equipment and facilities was achieved primarily through the use of high vacuum systems, with the operators wearing U.S. Bureau of Mines air supplied respirators. Full protective clothing and footwear were provided the workers.

Air samples were collected throughout the general area during the decontamination program and were counted for gross alpha emitters. The results of all air samples collected were below the MPC, with the exception of 4 samples. One sample was collected in the Radioisotopes Laboratory while chipping  $\text{SR}^{90}$  from a concrete wall. The result was reported as  $2.4 \times 10^{-10}$   $\mu\text{Ci}/\text{CC}$ . The second sample was collected in the Spheroidizing Room while removing ventilation ducts. The results of the air samples are given in Appendix C-1.

It should be noted that air supply respirators were worn by the operators during the time the air dust concentrations were measured. Urine specimens were submitted by personnel assigned to the program prior to working in the contaminated areas, in order to provide a base line study. Nasal swipes of all men working in the contaminated areas were performed twice daily. The results of all nasal swipes were low to negligible and did show proper use of respiratory protective equipment.

Water samples were collected of all liquid effluent, analyzed prior to release, and records of all sample analysis and personnel dosimetry reports are maintained in the office of the Martin Marietta Corporation's health physicist.



## II. LOCATION AND IDENTIFICATION OF FACILITIES

The subject nuclear laboratories that were decontaminated are located at Chesapeake Park and are owned by Martin Marietta Corporation at Baltimore, Maryland. The decontaminated laboratories encompass an area of approximately 40,000 FT<sup>2</sup>, located in the basement area of building "D". The total area was subdivided into small separate rooms where various types of nuclear activity were performed. Most of the small rooms were of the laboratory-type, and equipment included ventilation hoods, glove boxes, filtration medias, laboratory benches and laboratory glassware. False ceilings were also a part of some laboratories, and each ceiling was surveyed and removed, where necessary.

For the most part, the radioactivity was confined to glove boxes, ventilation hoods, ducts and filtration medias contained in each laboratory. The radioactive materials removed were in the form of residual uranium oxides, with the exception of a minor amount of SR<sup>90</sup> found on a wall.

Some of the laboratories contained sinks, floor drains and sumps used to control liquid effluent containing radioactive materials. The floor drains, traps and sumps were carefully monitored to determine the contamination level, if any, and the termination location of each drain line and sump line.

### III. HEALTH PHYSICS TECHNICAL APPROACH

The removal of residual contamination was accomplished through the direction and guidance of three health physicists, two from Eberline Instrument Corporation and one from Martin Marietta Corporation. The work crew consisted of eight qualified workers trained in the radiological health aspect of nuclear decontamination.

The contamination, for the most part, was not found to be tightly bonded or sealed to the surfaces of the facilities and therefore most of it was removed by the use of high vacuum systems with absolute filters. One wall and several floor areas showed evidence of bonded alpha activity and, therefore, it became necessary to use pneumatic tools to remove the contamination and reduce radiation levels to acceptable levels. Contamination that was found to be fixed on equipment, such as ventilation hoods, ducts and glove boxes, was allowed to remain fixed, and the equipment was properly packaged, identified and shipped by truck carrier to burial grounds in Moorehead, Kentucky. The transportation and burial of all contaminated equipment was provided by the Nuclear Engineering Company, Moorehead, Kentucky.

#### IV. SCOPE OF SURVEY AND GENERAL PROCEDURES FOLLOWED

Radiation detection equipment used during the effort included several gas proportional alpha counters, one floor alpha monitor, RM-15 (soft gamma measurement), one beta plus gamma counter, TLD badges and film badge dosimetry.

Swipe samples by the use of whatman filter paper were collected from all surface areas where it was thought to be necessary. The filter paper samples were then counted for any gross alpha contamination. All loose radioactive material was removed from the facilities. Equipment that was heavily contaminated, such as glove boxes and ventilation hoods, were properly packaged and shipped by carrier truck for burial.

There were no areas detected whereby radioactive materials had been sealed by painting or by other means, and there was no attempt to seal any areas containing fixed radioactive materials.

The general procedure followed to accomplish the decontamination effort is entitled "The Health and Safety Procedure for the Decontamination of Building "D", Martin Marietta Corporation, Baltimore, Maryland." The procedure is presently on file in the office of the U.S.A.E.C. Division of Materials Licensing. The procedure provided the basic guidelines for performing the decontamination in a safe manner. "The Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use" was closely adhered to by the Martin Marietta Corporation decontamination work crew.

## V. FINDINGS OF THE DECONTAMINATION SURVEY

The floors, walls and ceilings of all laboratories where nuclear activity was conducted were monitored and recleaned. Some areas did not show evidence of contamination. Those areas where contamination was found were vacuumed and sprayed with a jet-x cleaning device to remove any material that could not be vacuumed. The use of water was controlled and kept to a minimum to prevent water contamination and pollution.

During the initial phase of the decontamination inspection survey, six items or areas were found which required correction (letter to E. M. Chenault from S. J. Waligora, Jr., dated September 3, 1970) and all, with the exception of the floor drains, were corrected.

All floor drains were monitored and decontaminated as much as possible. Water samples were taken from the five drains indicating residual activity and all results showed low concentrations. (See Appendix C-2) The residual activity remaining in the six drains was estimated through the use of a 2" x 2" NaI(TR) crystal in conjunction with a single channel analyzer. With the detection system calibrated for  $^{235}\text{U}$  gamma rays, the following estimates were established:

<u>Drain No.</u>	<u><math>^{235}\text{U}(\mu\text{Ci})</math></u>
39	1.0
46	1.0
52	15.0
55	6.0
56	<u>6.0</u>
Total	29.0

Water samples taken from these drains showed very low concentrations. As a further check, water was flushed continuously through these five drains while a two liter water sample was taken from the sanitary sewer sump servicing that portion of the building. Samples were submitted for analysis and showed 0.003 pCi/ml (MPC 30.0 pCi/ml).

All drains have been left open for inspection. With approval from the U.S. Atomic Energy Commission, we propose to seal the five drains with cement, thereby permanently inactivating the total of 29 uCi of  $^{235}\text{U}$ . This measure would appear to be a feasible alternative to tearing out the concrete floor in order to remove the drains and associated pipe.

As a result of the final survey, all other areas were reduced to within limits prescribed by the U.S. Atomic Energy Commission. All walls, ceilings, and floors had been washed thoroughly or removed. The average alpha emitter contamination ( $^{235}\text{U}$  and/or  $^{238}\text{U}$  only) is much less than 500 dpm/100 cm<sup>2</sup>. Areas with remaining fixed alpha emitter contamination average less than 2,000 dpm/100 cm<sup>2</sup>. Beta-gamma contamination is essentially nonexistent;  $^{90}\text{Sr-Y}$  contamination which had been present in the Radioisotopes Laboratory has been completely removed with the exception of one minute area with fixed contamination measuring 0.5 mRad/hr.)

This area of Building "D" will soon be renovated by Chesapeake Park and any remaining fixed contamination will be further enclosed with replastering, retiling of floors, and repainting. Following the renovation, any fixed residual contamination should be so well fixed that there should be no evidence of even trace quantities during the remaining life of the structure.

VI. PACKAGING, TRANSPORTATION AND DISPOSAL OF CONTAMINATED EQUIPMENT

All contaminated equipment, such as glove boxes, ventilation hoods and duct work, were properly packaged and identified in accordance with the Department of Transportation rules and regulations and sent by truck carrier to Moorehead, Kentucky, for burial. A total of nineteen (19) truckloads of equipment were sent to the burial grounds, with each truckload encompassing approximately 1,920 cubic feet.

## APPENDIX B - SUMMARY OF DECONTAMINATION OPERATIONS

The following is a chronological task summary of decontamination operations from June 1 through September 3, 1970, and represents approximately 2400 man hours of labor.

1. Organization of people, equipment, supplies, and facilities; establishment of procedures and policies.
2. Removal of exhaust ducts from furnace room.
3. Samples taken from areas with potential for tritium and for cobalt 60 contamination.
4. Machinery and equipment removed from furnace room.
5. Areas expected to be clean were monitored and any anomalies entered to the work plan.
6. Arrangements were made for special disposal of nonradioactive but hazardous wastes (acids, alkalis, solvents, nitrates, peroxides, etc.)
7. Removed parafin shielding from neutron generator area.
8. Removed equipment from laundry area.
9. Surveyed dehydrator rooms and segregated areas and equipment.
10. Cleaned nine rooms which required general decontamination, but which posed no problems due to presence of contaminated equipment, exhaust ducts, absolute filters, etc.
11. Laundry area cleaned including removal of construction blocks and floor tiles.
12. Cleaned powder room - highly contaminated.
13. Discovered "contamination" in heat plant boiler room which analyses showed to be naturally occurring thorium.
14. Fire (primarily smoke) as the result of torches used during duct removal on outside of building by a local contractor. This duct work was past the absolute filter bands and there was no attendant radiation hazard

15. General cleaning accomplished in five additional rooms.
16. Vault decontaminated and bird cages removed.
17. Chipped concrete walls contaminated with <sup>90</sup>Sr-Y in Radioisotopes Laboratory.
18. Ductwork removal and clean-up in two additional rooms.
19. Removed glove boxes and other contaminated equipment from Spheroidizing Room; proceeded with remainder of clean-up.
20. Removed installed casework in Inorganic Chemistry Laboratory.
21. Decontaminated restroom floors in supposedly clean area.
22. Cleaned contamination which resulted from clean-up of Spheroidization Room.
23. Inspected Oil Farm Building (remote to Building "D") and removed contaminated equipment that had been stored. Survey showed no further decontamination was necessary.
24. Proceeded with clean-up of Inorganic Chemistry Laboratory.
25. Removed ducts and proceeded with clean-up of Powder Metal Room.
26. Removed duct and proceeding with clean-up of three rooms.
27. Removed duct work and equipment in Ceramics Laboratory and Spheroidization Laboratory.
28. Steamed Pellet Room in preparation to clean-up in order to reduce airborne (resuspended) contamination. Proceeded with clean-up.
29. Powder Room was also steamed prior to clean-up.
30. Removed absolute filters associated with Pellet Room.
31. All drains monitored and cleaned. Five remain contaminated.
32. Removed vertical rolling mill (several tons) from Powder Room. Residual contamination forced removal of two walls, ceilings, and floor tiles.
33. Ceiling and floor tiles removed in Spheroidization Room.
34. Removed absolute filters associated with Vault Room.



35. Final blowers, filters and ducts removed at termination and ventilation exhaust equipment.
36. Removed absolute filters and remainder of equipment associated with the Radioisotopes Laboratory.
37. Proceeded throughout entire facility with final monitoring and removed any contaminated items including floor tile, miscellaneous fixtures. Washed down all remaining ceilings, walls, and floors several times. A detailed swipe survey was performed.
38. Sumps and chip tanks associated with Dehydrator, Laundry Room, and Cleaning Room were decontaminated.
39. Asphalt floor covering in Cleaning Room removed.
40. Final waste shipment (19th truckload) departed. Two additional barrels filled with remaining miscellany for future shipment.

APPENDIX C - SAMPLE ANALYSIS RESULTS

1. Environmental Air Samples

<u>Location</u>	<u>Date</u>	<u>Concentration (uCi/ec)</u>
Radioisotopes Laboratory	7/9/70	$92.3 \pm 0.6 \times 10^{-12}$
Radioisotopes Laboratory	7/9/70	$240.0 \pm 1.0 \times 10^{-12}$
Spheroidizing Room	7/14/70	$68 \pm 2 \times 10^{-12}$
" "	7/15/70	$413 \pm 10 \times 10^{-12}$
Dehydrator Room (during fire)	6/26/70	$3.3 \times 10^{-12}$
Furnace Room	6/17/70	$1.17 \times 10^{-13}$
" "	6/17/70	$8.5 \times 10^{-13}$
" "	6/18/70	$2.7 \times 10^{-13}$
" "	6/19/70	$1.1 \times 10^{-13}$
" "	6/22/70	$5.36 \times 10^{-13}$
" "	6/23/70	$3.3 \times 10^{-13}$
" "	6/23/70	$2.6 \times 10^{-12}$
" "	6/23/70	$5.3 \times 10^{-12}$
" "	6/24/70	$2.7 \times 10^{-13}$
" "	6/24/70	$3.5 \times 10^{-12}$
Break Room	6/24/70	$2.1 \times 10^{-12}$
Furnace Room	6/25/70	$5.5 \times 10^{-13}$
" "	6/25/70	$3.5 \times 10^{-12}$
" "	6/26/70	$3.5 \times 10^{-12}$
" "	6/26/70	$2.7 \times 10^{-13}$
" "	6/26/70	$3.3 \times 10^{-12}$
" "	6/26/70	$3.5 \times 10^{-12}$
" "	6/26/70	$2.7 \times 10^{-13}$
" "	6/29/70	$3.5 \times 10^{-12}$
" "	6/29/70	$2.6 \times 10^{-12}$

Environmental Air Samples (Continued)

<u>Location</u>	<u>Date</u>	<u>Concentration (uCi/ec)</u>
Furnace Room	6/30/70	$1.75 \times 10^{-12}$
" "	6/30/70	$3.6 \times 10^{-13}$
" "	7/1/70	$1.4 \times 10^{-12}$
" "	7/1/70	$5.5 \times 10^{-13}$
" "	7/6/70	$3.5 \times 10^{-12}$
" "	7/6/70	$1.75 \times 10^{-12}$
" "	7/6/70	$6.6 \times 10^{-13}$
" "	7/7/70	$3.3 \times 10^{-13}$
" "	7/8/70	$1.6 \times 10^{-13}$
" "	7/9/70	$2.7 \times 10^{-13}$
Spheroidizing Room	7/10/70	$1.1 \times 10^{-13}$
Flame Room #12	7/10/70	$2.6 \times 10^{-12}$
Inorganic Chemistry Lab	7/13/70	$2.5 \times 10^{-12}$
" " "	7/13/70	$6.2 \times 10^{-12}$
Spheroidizing Room	7/13/70	$4.0 \times 10^{-12}$
Room #11	7/14/70	$3.0 \times 10^{-12}$
* Spheroidizing Room	7/14/70	$6.8 \times 10^{-10}$
Room #11	7/15/70	$1.6 \times 10^{-12}$
* Spheroidizing Room	7/15/70	$4.13 \times 10^{-10}$
Room #11	7/16/70	$7.0 \times 10^{-13}$
Spheroidizing Room	7/16/70	$6.6 \times 10^{-11}$
Spheroidizing Room	7/17/70	$7.9 \times 10^{-11}$
Furnace Room	7/20/70	$5.2 \times 10^{-13}$
Inorganic Chemistry Lab	7/21/70	$4.4 \times 10^{-12}$
Inorganic Chemistry Lab	7/21/70	$4.6 \times 10^{-12}$
* Spheroidizing Room	7/21/70	$1.7 \times 10^{-10}$

Environmental Air Samples (Continued)

<u>Location</u>	<u>Date</u>	<u>Concentration (u Ci/ec)</u>
Furnace Room (Shipping Area)	7/22/70	$3.9 \times 10^{-13}$
Inorganic Chemistry Lab	7/22/70	$8.6 \times 10^{-13}$
" " "	7/22/70	$1.7 \times 10^{-12}$
Room #32	7/23/70	$1.75 \times 10^{-11}$
Room #32	7/23/70	$2.6 \times 10^{-12}$
Room #57	7/23/70	$7.0 \times 10^{-12}$
Spheroidizing Room	7/24/70	$3.1 \times 10^{-12}$
Room #41 (Vault)	7/24/70	$1.4 \times 10^{-12}$
Room #21 (Powder Metal)	7/24/70	$6.3 \times 10^{-12}$
Spheroidizing Room	7/27/70	$1.47 \times 10^{-11}$
" " "	7/27/70	$2.2 \times 10^{-12}$
Room #41 (Vault)	7/27/70	$6.0 \times 10^{-12}$
Spheroidizing Room	7/28/70	$9.9 \times 10^{-11}$
Room #41 (Vault)	7/28/70	$1.4 \times 10^{-12}$
Room #21 (Powder Metal)	7/29/70	$1.97 \times 10^{-11}$
" " " "	7/29/70	$1.18 \times 10^{-11}$
Spheroidizing Room	7/29/70	$2.1 \times 10^{-12}$
Ceramics Lab	7/30/70	$7.0 \times 10^{-12}$
" "	7/30/70	$2.9 \times 10^{-12}$
Spheroidizing Room	7/30/70	$1.0 \times 10^{-12}$
Ceramics Lab	7/31/70	$4.2 \times 10^{-12}$
Dehydrator Room	7/31/70	$7.0 \times 10^{-12}$
Spheroidizing Room	7/31/70	$4.4 \times 10^{-12}$
Furnace Room (Shipping Area)	8/3/70	$3.5 \times 10^{-11}$
Corrosion Test Lab	8/3/70	$1.6 \times 10^{-12}$
Spheroidizing Lab	8/4/70	$2.2 \times 10^{-11}$
Pellet Room	8/4/70	$7.0 \times 10^{-12}$

Environmental Air Samples (Continued)

<u>Location</u>	<u>Date</u>	<u>Concentration (uCi/ec)</u>
Furnace Room (Shipping Area)	8/4/70	$2.4 \times 10^{-12}$
Pellet Room	8/5/70	$5.3 \times 10^{-12}$
" "	8/5/70	$9.3 \times 10^{-12}$
Furnace Room (Room #11)	8/5/70	$1.6 \times 10^{-12}$
Pellet Room	8/6/70	$9.5 \times 10^{-13}$
Furnace Room (Shipping Area)	8/7/70	$7.7 \times 10^{-12}$
" " " "	8/7/70	$8.8 \times 10^{-12}$
Furnace Room (Room #11)	8/7/70	$3.3 \times 10^{-13}$
" " " "	8/10/70	$7.0 \times 10^{-12}$
Shower Room	8/10/70	$1.9 \times 10^{-11}$
Furnace Room (Shipping Area)	8/10/70	$3.0 \times 10^{-12}$
" " " "	8/11/70	$2.2 \times 10^{-12}$
" " " "	8/12/70	$1.1 \times 10^{-12}$
" " " "	8/13/70	$1.1 \times 10^{-12}$
" " " "	8/13/70	$1.9 \times 10^{-12}$
" " " "	8/14/70	$1.1 \times 10^{-12}$
" " " "	8/15/70	$1.6 \times 10^{-12}$
" " " "	8/16/70	$1.1 \times 10^{-12}$
" " " "	8/17/70	$4.5 \times 10^{-12}$
" " " "	8/19/70	$7.6 \times 10^{-13}$
" " " "	8/19/70	$2.5 \times 10^{-12}$
Dehydrator Room	8/21/70	$4.9 \times 10^{-13}$
Block House (Mach. Equip.)	8/22/70	$1.9 \times 10^{-12}$
Dehydrator Room	8/23/70	$3.8 \times 10^{-13}$
" "	8/24/70	$3.2 \times 10^{-13}$
Radioisotopes Lab	8/24/70	$2.2 \times 10^{-12}$

2. Environmental Water Samples

<u>Location</u>	<u>Date</u>	<u>Concentration (pCi/l)</u>
<sup>60</sup> Co Shielding Pool	6/4/70	> 5
Dehydrator Sump	6/17/70	15.6±2.0
Dehydrator Effluent	6/17/70	2.8±1.0
E. Tunnel Welding Shop (#58)	8/17/70	{ 236±10 { 113±8
Pellet Room Sump	8/17/70	{ 318±13 { 376±13
Plating Room Chip Tank	8/17/70	{ 852±21 { 916±20
Dyn. Corr. Lab Chip Tank	8/17/70	{ 112±8 { 123±7
Summary Sump	9/1/70	
Summary Sump	9/1/70	

3. Environmental Swipe and Soil Analysis

a. Tritium Swipes (All in Neutron Generator Room)

<u>Location</u>	<u>Date</u>	<u>uCi/100cm<sup>2</sup></u>
Wall Mount	6/4/70	5.5x10 <sup>-5</sup>
Target Box	6/4/70	1.9x10 <sup>-5</sup>
Neutron Generator	6/4/70	1.4x10 <sup>-5</sup>
Lab Room 3	6/4/70	1.6x10 <sup>-4</sup>

b. Soil Samples From South Area Outside Bldg. D

<u>Location</u>	<u>Date</u>	<u>pCi/gm</u>	
#1		<sup>238</sup> U 0.38±0.07	<sup>235</sup> U 0.13±0.04
#2		0.48±0.08	0.39±0.07
#3		0.56±0.07	0.27±0.05
#4		0.40±0.06	0.48±0.07
#5		24.5±0.12	9.14±0.87
#6		0.68±0.12	0.61±0.11

b. Soil Samples From South Area Outside Bldg. D (Continued)

<u>Location</u>	<u>Date</u>	<u>pCi/gm</u>	
		<u><sup>238</sup>U</u>	<u><sup>235</sup>U</u>
#7		0.64±0.10	0.33±0.07
#8		1.13±0.14	5.27±0.41

c. Firebrick from Boiler Room (Not associated with contaminated area)

Fire Box Residue	6/25/70
Fire Box Bricks	6/25/70
Boiler Fuel	6/25/70

4. Bioassay Sampling

a. Positive Nose Swipes

<u>Name</u>	<u>Date</u>	<u>Total dpm Both Nostrils</u>
Sandoval	6/12/70 (AM)	200
Eysaw	6/15/70 (PM)	200
Keyser	6/16/70 (PM)	200
Sandoval	6/16/70 (PM)	200
Perry	6/17/70 (AM)	100
Craig	6/17/70 (PM)	100
Libby	6/17/70 (PM)	100
Perry	6/17/70 (PM)	100
Petroshko	6/17/70 (PM)	100
Hallowel	6/18/70 (PM)	100
Eysaw	6/18/70 (PM)	100
Keyser	6/19/70 (PM)	200
Sandoval	6/19/70 (PM)	100
Perry	6/19/70 (PM)	200
Harwood	6/19/70 (PM)	100
Hollowell	6/22/70 (AM)	100

a. Positive Nose Swipes (Continued)

<u>Name</u>	<u>Date</u>	<u>Total dpm Both Nostrils</u>
Cridlebaugh	6/22/70 (AM)	100
Harwood	6/22/70 (AM)	100
Sandoval	6/22/70 (PM)	100
Hysaw	6/23/70 (PM)	100
Cridlebaugh	6/29/70 (PM)	300
Hollowell	7/7/70 (AM)	100
Cridlebaugh	7/7/70 (AM)	100
Craig	7/7/70 (PM)	100
Libby	7/7/70 (PM)	100
Sandoval	7/10/70 (AM)	100
Sandoval	7/10/70 (PM)	100
Harwood	7/10/70 (PM)	100
Keyser	7/13/70 (AM)	100
Craig	7/13/70 (AM)	100
Craig	7/13/70 (PM)	100
Sandoval	7/13/70 (PM)	200
Harwood	7/13/70 (PM)	100
Libby	7/14/70 (AM)	100
Sandoval	7/14/70 (AM)	100
Petrochko	7/14/70 (AM)	100
Mericle	7/14/70 (AM)	100
Craig	7/28/70 (AM)	200
Libby	7/28/70 (AM)	200
Harwood	7/28/70 (AM)	100
White	7/28/70 (AM)	200
Hollowell	7/28/70 (PM)	100



a. Positive Nose Swipes (Continued)

<u>Name</u>	<u>Date</u>	<u>Total dpm Both Nostrils</u>
Keyser	7/29/70 (AM)	100
Craig	7/29/70 (AM)	200
Hysaw	7/29/70 (AM)	100
Keyser	8/11/70 (AM)	100
Keyser	8/15/70 (AM)	200

b. Urine Sample Results (24-hour sample)

<u>Name</u>	<u>Date</u>	<u>dpm/Sample 235U</u>
R. Sandoval	6/20/70	0.00±0.05 dpm
R. Criddlebaugh	7/4/70	0.00± 0.03 dpm
H. Keyser	7/4/70	0.00±0.03 dpm
W. Hollowell	7/4/70	0.00±0.03 dpm
J. Craig	7/4/70	0.06±0.03 dpm
J. Hysaw	7/4/70	0.00±0.03 dpm
G. Libby	7/4/70	0.00±0.03 dpm
R. Sandoval	7/4/70	0.00±0.03 dpm
H. Perry	7/4/70	0.00±0.03 dpm
W. Harwood	7/4/70	0.00±0.03 dpm
R. Petrochko	7/4/70	0.00±0.03 dpm
D. Mericle	7/4/70	0.00±0.03 dpm
* (Eberline) D. Mericle	7/28/70	2.9±0.7 dpm
* (Eberline) F. White	7/28/70	10±2 dpm
W. Harwood	7/30/70	0.00±0.05 dpm

Results of Occupational Radiation Exposure Report

<u>Film Badge No.</u>	<u>Participant's Name</u>	<u>Radiation Exposure Period June 8-Sept. 2, 1970</u>	<u>(MREM) Beta Gamma Neutron</u>
00055	H. W. Keyser		.00
00056	W. Hollowell		.00
00057	J. Craig		.00
00058	J. Hysaw		.00
00059	G. Libby		.00
00061	B. Sandoval		.00
00062	H. Perry		.00
00063	R. Cridlebaugh		.00
00064	W. Harwood		.00
854014	E. M. Chenault		.00