

UNITED STATES  
ATOMIC ENERGY COMMISSION

IN REPLY REFER TO:  
OFO:WEM

Oak Ridge, Tennessee  
December 23, 1960

U. S. Army Chemical Corps School  
Fort McClellan, Alabama

Attention: Colonel Carl W. Bartling  
Chairman, Isotope Committee  
Department of the Army

Subject: U-233 PLATES

Gentlemen:

Reference is made to your order for 25 milligrams of U-233 as oxide to be plated on 450 stainless steel plates.

Some of your specifications for the plates will present problems. We would prefer the plates to have a 1/2 inch margin. This would reduce the plated area to approximately 12 square inches. Also, we feel the use of crocus cloth as a test of adherence is somewhat inappropriate since your desired activity will require only a minute film of oxide. For resolution of these and other problems we suggest that you contact Mr. J. C. Barton of the Union Carbide Nuclear Company, Post Office Box P, Oak Ridge, Tennessee. His phone number is Oak Ridge L. D. 220, Extension 8142.

We note you have specified a charge of \$5,500.00 for fabrication, etc. The total charges for the fabrication will be based on our actual costs; and at the present time they are estimated to be approximately \$16.00 per plate or approximately \$7,200 for 450. We will make every effort to reduce these charges, if possible. Please advise if these charges are acceptable to you.

601-07  
608-00  
file 550

Colonel Carl W. Bartling

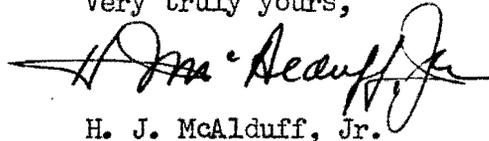
- 2 -

December 23, 1960

Also, you should be advised that we have received and placed an order for 1800 similar plates for the Department of the Navy, Bureau of Yards and Docks. At the present time, it is our intention to provide them with 450 plates before work will begin on your order. This would mean that shipment to you would be delayed until approximately September 1961.

Please advise if we can be of further assistance in this matter.

Very truly yours,



H. J. McAlduff, Jr.  
AEC Materials Leasing Officer  
Production Division

CC: Mr. A. P. Huber, ORGDP  
Mr. R. C. Armstrong

# OAK RIDGE NATIONAL LABORATORY

OPERATED BY

UNION CARBIDE NUCLEAR COMPANY



POST OFFICE BOX X  
OAK RIDGE, TENNESSEE

April 19, 1961

Major Charles D. Causey  
U. S. Army Chemical Corps School  
Fort McClellan, Alabama

Subject: URANIUM-233 SOURCES

Reference: Your File CMLTC-S-T

Dear Major Causey:

The 450 U-233 plates on 3 x 7 stainless steel have been prepared and are ready for shipment.

In your letter of February 1, 1961, you stated that the bonding integrity test should be acceptable to the U. S. Atomic Energy Commission. We assume that this refers to the Division of Licensing and Regulation. If your present license describes the test to be used for bonding integrity, we suggest that you submit the enclosed test data to the U. S. A. E. C., Division of Licensing and Regulation, requesting that your license be altered to accept the plates described. We believe that the plates prepared for you by using a ceramic fused coating are greatly superior to electroplated plates, considering your intended use.

The smear tests referred to in the test data are dry filter paper smears at a pressure of ~ 10 psi.

Test method and results (all plates washed in mild detergent following preparation and fusion of the ceramic coating):

Typical smears (~ 10 psi dry filter paper)

2 x 10 <sup>5</sup> activity plates		60 to 384 c/m/100 cm <sup>2</sup>
3.9 x 10 <sup>5</sup>	" "	0 to 344 c/m/100 cm <sup>2</sup>
9.5 x 10 <sup>5</sup>	" "	0 to 580 c/m/100 cm <sup>2</sup>
1.9 x 10 <sup>6</sup>	" "	1530 to 6800 c/m/100 cm <sup>2</sup>

Weathering tests were conducted by exposing plates continuously for 90 hours--rain and overcast, approximately 40 hours; sun, 10 hours; and darkness for the balance of time. A comparison plate fabricated by

April 19, 1961

electroplating uranium on stainless steel was used in the weathering tests. The electroplated comparison plate had a total activity of  $1.2 \times 10^5$  c/m and the ceramic plate,  $2.0 \times 10^5$  c/m total activity. Table I provides weathering comparison data.

TABLE I

	<u>Initial Smears</u> c/m	<u>24-Hr Exposure Smears</u> c/m	<u>90-Hr Exposure Smears</u> c/m
Electroplated	24:30	408:252	1788:1994
Ceramic	136:134	200:168	188:244

The ceramic coating is approximately one micron thick, is highly chip resistant, and activity is not transferred by normal handling.

You might wish to wash the plates periodically in a mild detergent, avoiding high alkali washes to further insure that activity will not be transferred.

We interpret the tests to indicate the ceramic-coated plates to be at least ten times better from the standpoint of weathering than the electroplated plates.

Please advise when shipment can be made.

Very truly yours,



F. N. Case  
Isotopes Sales Department  
Isotopes Division

FNC:rc

AUG 3 1961

Transfer Series A. ORL (From) B. ENM-344 (To) C. 1 (Number)

2. Shipped By (Shipper):  
Name Oak Ridge National Laboratory  
Address Oak Ridge, Tennessee

3. Shipped to (Receiver):  
Name U. S. Army Chemical Corps School  
Address Fort McClellan, Alabama

4. Shipped For Account Of Lic. No. \_\_\_\_\_  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
Lease No. \_\_\_\_\_

5. Shipped To Account Of Lic. No. ENM-344  
Name Department of the Army  
Address \_\_\_\_\_  
(For AEC Use Only):  
Lease No. 1003 Order No. AC-616

6. (For AEC Use Only):  
Nuclear Material Draft (Form AEC-437)  
Number 7000/ENM-344/323

7. SS Material (Check One):  
(A) Enriched Uranium  
(B) Uranium-233   
(C) Plutonium  
(D) Other

8. Material Description:  
U-233, 25 mg U-233 diluted with U-238 deposited on 450 B8 plates as oxide, permanently fixed.

9. This Transfer Involves:  
(A) Initiating Lease Responsibility  
(B) Transfer of Lease Responsibility  
(C) Return to AEC for Credit  
(D) No Change in Lease Responsibility (Transfer of Material Only)

10. Material Quantities A. Weight Units

B. Container No.	C. Piece Count	D. Gross Weight	E. Tare Weight	F. Net Weight	G. Element Weight	H. Weight % Isotope	I. Isotope Weight
(9) <u>Wooden Boxes</u>	<u>450 Plates</u>	<u>225 lbs.</u>			<u>26 mgs</u>	<u>97.85</u>	<u>U-233 25 mgs.</u>

FORWARDED BY  
NUCLEAR MATERIALS CONTROL BRANCH  
DATE AUG 1 1961

11. The Above Items and Quantities Shipped  
July 27 1961  
[Signature]  
(Shipper's Signature) Stringfield

12. The Above Items and Quantities Received  
July 27 1961  
[Signature]  
(Receiver's Signature)



U.S. ARMY CHEMICAL SCHOOL  
FORT McCLELLAN, ALABAMA

IN REPLY REFER TO:

31 JUL 1963

AJMCL-V

SUBJECT: Byproduct Material License No. 1-2861-1

TO: United States Atomic Energy Commission  
ATTN: Isotopes Branch, Division of  
Licensing and Regulation  
Washington 25, D. C.



1. Reference: Your letter, file: LR:IB:NB(50945), dated 10 July 1963, in regard to our application for renewal of License No. 1-2861-1.
2. The following information is furnished in answer to your questions:
  - a. As of 17 July 1963 the U. S. Army Chemical Center and School had approximately 7,610 curies of cobalt 60.
  - b. All the above cobalt 60 is metallic in pellet or wafer form.
  - c. It is proposed to procure 750 new sources from Gamma Industries, Inc., 2255 Ted Dunham Avenue, Baton Rouge, Louisiana. They are to encapsulate the cobalt into sources which will give 20 rhm per source. (See Inclosure 1.) The capsule which will be supplied to the manufacturer is the same capsule for which previous approval has been given the U. S. Army Chemical Center and School, with the exception that the ends will be heliarc welded instead of silver soldered. (See Inclosure 2.) It is felt that the heliarc weld will give a better seal than silver solder.
  - d. Available records indicate that approximately 541 cobalt 60 source wells were originally installed in the Pelham Range radiological field. In 1961 approximately 60 of these wells were found to have deteriorated so the sources were pulled from them and stored in sunken drums inside the radiological field. Total quantity of cobalt 60 as of 17 July 1963 in the radiological field was approximately 2,350 curies including that buried in the drums.

AJMCL-V

SUBJECT: Byproduct Material License No. 1-2861-1

e. Breakdown of the 20,000 curie possession limit is as follows:

- (1) 2,350 curies are currently in the radiological field.
- (2) 5,230 curies are currently in the Hot Cell. Of this it is planned to re-encapsulate 3,750 curies into 250 capsules for use in the expanded radiological field and dispose of the remaining 1,480 curies.
- (3) 11,250 curies are to be obtained in the 750 capsules from Gamma Industries, and are to be installed in the expanded radiological field.
- (4) 1,170 curies are to allow for possible receipt of slightly overstrength sources from Gamma Industries and for other contingencies.

3. The amended Chapter 12 has been approved by the Isotope Committee and by the Commandant, U. S. Army Chemical Center and School, and is therefore already in effect. The original Chapter 12 was amended by extracting those annexes which applied primarily to Health Physics and incorporating them into the Health Physics SOP thus causing Chapter 12 to be more applicable to the overall operation of the School.

2 Incl

1. Amendment to Invitation for Bids, Page 1 and Appendix I
2. Drawing of capsule



IRA B. WEBBER  
Colonel, CmLC  
Chairman, Isotope Committee

Copy furnished:

Office of the Surgeon General  
Washington, D. C.

APPENDIX I  
Cobalt 60, 20 Rontgens

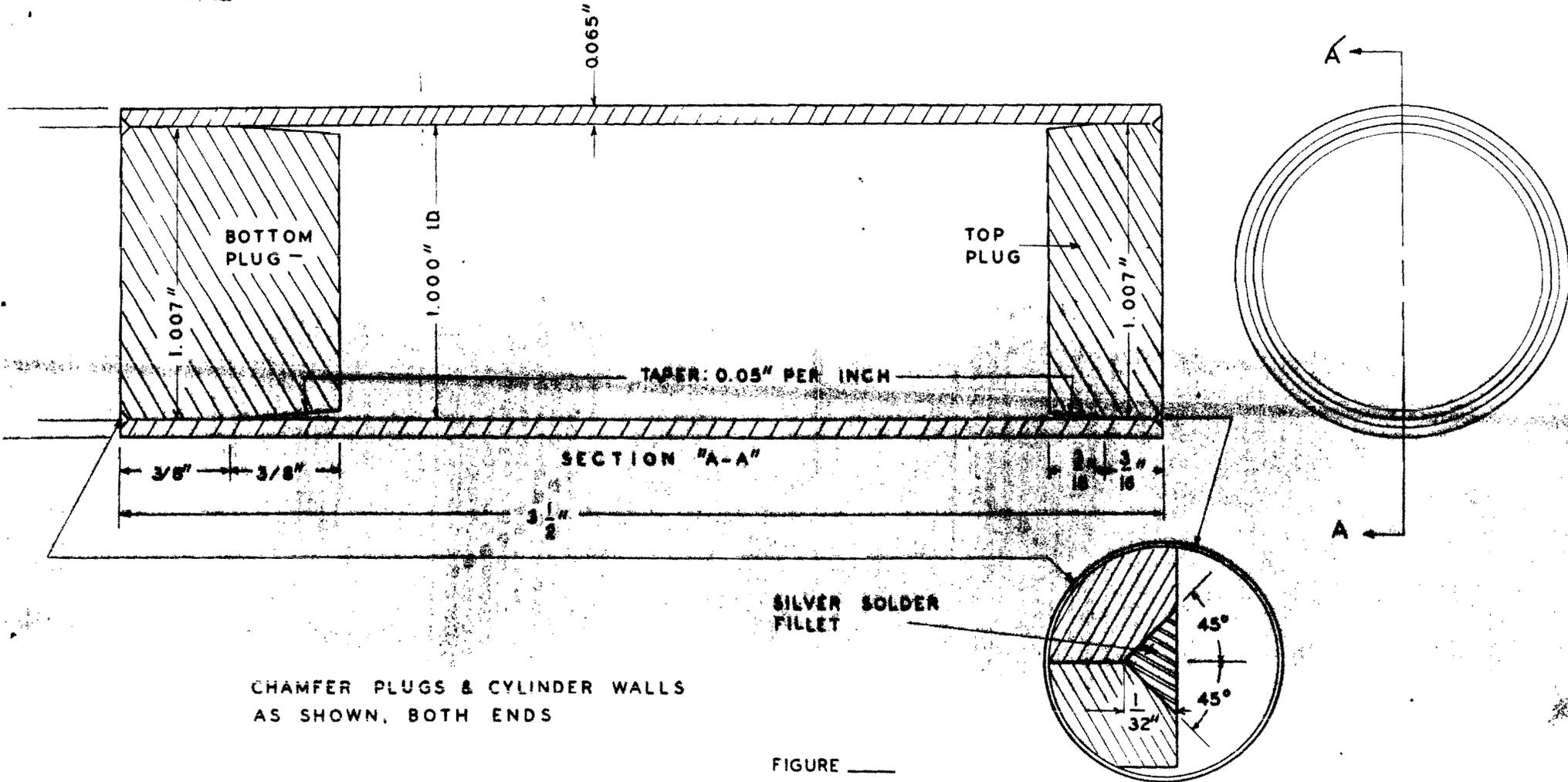
Technical Requirements

1. Output of each encapsulated source shall be 20 rads per hour  $\pm$  10% at one meter, when measured from side of capsule.
2. Each source may consist of more than one piece of Cobalt 60. Each piece shall be plated with nickel or gold.
3. Capsule components, delineated in Figure A, shall be Government-furnished and shall be assembled as shown.
4. Top and bottom plugs shall be heliarc welded, 360° around the cylinder to form a hermetic seal.
5. Each encapsulated source, prior to assembly into inner container, shall be vibration-tested, as specified for Level A Military Pack, Surface Transportation, in accordance with CERCLA Test Manual 70-1, dated March 1963. For this test, instead of a shipping container, each source shall be placed inside a small metal screw-cap container, approximately 2" diameter by 5" high. After vibration, as specified above, the source shall not allow a transfer of radioactive material exceeding  $5 \times 10^{-5}$  microcuries, when tested for radioactive leakage, as specified below. The source shall then be set aside for a minimum of seven days and then retested for radioactive leakage, as specified below. The retest shall not allow a transfer of radioactive material exceeding  $5 \times 10^{-5}$  microcuries.
6. Radioactive Leakage. All external surfaces of each encapsulated source, all internal and external surfaces of each 2R Inner Container and all internal and external surfaces of each shipping container shall be subjected to Radioactive Leakage tests. These surfaces shall be wiped firmly with high wet-strength filter paper, moistened with a 1% solution of versene in distilled water. The filter paper shall be allowed to dry and the contamination present determined. If the amount of radioactive material transferred to the filter paper from the source exceeds  $5 \times 10^{-5}$  microcuries, for either test or 7-day retest, then the encapsulated source shall be considered to be contaminated and the source rejected. If the amount of radioactive material transferred to the filter paper from either the 2R Inner Container or the shipping container exceeds 500 disintegrations per minute alpha or 1000 disintegrations per minute beta plus gamma, then the container shall be considered to be contaminated and the container rejected.

APPENDIX II, Cobalt 60, 20 Roentgens, Technical Requirements (Cont'd)

7. Hermetic Seal. After vibration testing, each source shall show no evidence of air leakage when tested as follows: Place the source in water ( $70^{\circ} \pm 5^{\circ}\text{F}$ ) containing a suitable wetting agent (Aerosol OT, 5 cc per gallon), subject to 26-inch vacuum for 30 seconds. A steady stream or recurrent succession of bubbles emitted from the source shall be considered as evidence of leakage.

MATERIAL: CYLINDER & PLUGS, # 430 STAINLESS STEEL



CHAMFER PLUGS & CYLINDER WALLS  
AS SHOWN, BOTH ENDS

FIGURE \_\_\_\_\_

DETAIL OF CHAMFER

*120*  
*file*  
Office Memorandum • UNITED STATES GOVERNMENT

TO : James R. Mason, Chief, Isotopes Branch  
Division of Licensing and Regulation

DATE: February 24, 1958

FROM : *Lester R. Rogers*  
Lester R. Rogers, Chief, Radiation Safety Branch  
Division of Licensing and Regulation

SUBJECT: ARMY CHEMICAL CORPS SCHOOL, FORT McCLELLAN, ALABAMA, NOVEMBER 9, 1956

SYMBOL: DLR:RFB

Reference subject visit, paragraph 4, which refers to disposal of waste in a field set aside for the purpose.

It is indicated that the quantities of material may be in excess of those permitted for disposal under Part 20. It may be desirable to consider amending their license to cover this method of disposal.

We are returning the report of the visit for your retention.

Attachment:  
As stated above

*Waste disposal has been changed since date of visit.*  
*JEB/PER*





72-28-56

U.S.A.E.C.  
Washington, D. C.

Attn: Lester R. Rogers  
Division of Civilian Application

Attached is Ft. McClellan trip report as per your  
request.

JWH

## Office Memorandum • UNITED STATES GOVERNMENT

TO : Isotopes Extension Files

DATE: November 16, 1956

FROM : *JWH*  
J. W. Hitch and J. N. Maddox

SUBJECT: VISIT TO U. S. ARMY CHEMICAL CORPS SCHOOL, FORT McCLELLAN, ALABAMA

SYMBOL: IEB:JWH

Persons Visited: Lt. Col. Charles Brice, Jr., Chief of Technical Division and Lt. William G. Powell, Radiological Safety Officer.

Other Persons Visited Included: Major Daniel E. Kalish, 2nd Lt. James M. Williams and 2nd Lt. Robert F. Smith who is assistant radiological safety officer. Col. C. H. Wood is chairman of the radioisotopes Committee; however, he was unable to be present on the date of our visit.

Other Members of the Isotopes Committee are as follows:

Col. Joseph M. Cameron  
Major John B. Beach

License: This institution has not had a license. They have been operating under a General Authorization with an unlimited procurement limit. The authorization expires on December 31, 1956.

Field Representatives: J. W. Hitch, John N. Maddox.

Accompanied by: G. E. Giboney, Savannah River Operations Office.

Date of Visit: Pre-Licensing visit on November 9, 1956.

#### I. Administrative Control

The administrative control of the program at this institution appears to be satisfactory with the exception of rather high exposures to several personnel during the encapsulation of some radionuclides. Standard operating procedures, as published in April, 1953, are presently being revised. From an administrative standpoint, the SOP, as outlined, appears to be reasonably satisfactory. However, the radiation symbol used at this institution does not comply with that as noted in Part 20 of our proposed Code of Federal Regulations.

The program at this installation is that of training soldiers in fall-out surveys, and it is necessary that these people receive some exposures to radiation. However, for the most part, it is unnecessary that they receive levels close to the 300 mr/wk MPE value. The high exposures to Lt. Powell and Sgt. Courtwright indicated that Lt. Powell had insufficient understanding of the radiation hazards. He indicated that some of their people wished to come to Oak Ridge for further training in radiation safety. He indicated that he had contact with Dr. Anderson, ORNL, regarding training of other individuals and also the possibility of obtaining personnel already trained. Lt. Powell has had the health physics course at ORNL, but it was doubtful that he was putting into practice the precepts which such a course normally establishes.

## II. Procurement Control

Procurement of radioisotopes at this institution appeared to be well coordinated, although they had obtained some rather large amounts of radiocobalt under their present authorization. They indicated that they might obtain more, although they had approximately 400 curies in storage at the time of our visit.

## III. Material on Hand

During the past year, this institution received 1 unit of Mercury 203, 718 curies of Cobalt and 2710 curies of Cobalt in another shipment. At the time of our visit, 3750 curies of Cobalt was in storage on the Rad Survey Area No. 3. These sources were stored underground in devices which can be operated by a long string to bring the source above the surface. The size of these sources vary in magnitude from less than 100 millicuries to several hundred millicurie units. The area is well fenced, although we did not have a chance to visit it - it being several miles from the main school and accessible only by jeep or by foot. Other Cobalt stored was 450 curies, mostly stored underground in a water bath.

## IV. Disposal of Radioisotopes

It was learned that Ft. McClellan has set aside a field for the disposal of radioactive waste. Most of this waste is contaminated equipment, although we did not see this disposal area. It was reported to have been enclosed and secured against unauthorized entry. It was reported also that the field was posted to assist in controlling entry to the area. The area was selected because of its topographical qualifications and the low possibility of radioactive materials migrating into drinking water supplies. All waste is buried at a depth not less than 10 feet below the surface.

It was pointed out to Lt. Powell that burial ground should first be approved by the AEC prior to use. However, it appeared, from his description, they had observed the precautionary measures which we would normally require.

#### V. Facilities and Equipment

There were several rooms set aside for calibration of instruments; this being a part of the course of instruction. Trainees may work in a field approximately 40 mr/hr over short periods. Normal exposures to personnel over the entire course is not proven to be greater than 3 or 400 mr. The facility used for encapsulation had been disassembled. We were assured that new facilities were to be constructed prior to further encapsulation. A pair of slave manipulators from Central Scientific Company has already been delivered for use in this proposed hot cell. A small room, approximately 10 foot square, was constructed in a fenced off area in the rear of the training building. This room had walls of approximately 10 inches of concrete and had stored within a variety of small sources of radiocobalt which could be used in the radiation survey area. In addition, there were 3 large storage containers, approximately 18 inches in diameter which could be used for storage. These containers were steel jacketed and lead filled and had been obtained from Dugway Proving Ground. In addition, a water well at one corner of this building was used for storage of approximately 400 curies of Cobalt. Storage of Cobalt and facilities for future storage appeared to be entirely adequate.

#### VI. Ventilation

One of the laboratories was equipped with a very nice fume hood; however, it appeared to have had very little use up to the present time. All laboratory floors were covered with mastie tile and kept well polished. Work areas and surfaces were in first-class condition.

#### VII. Shielding

The only shielding which we were able to review was that used for storage and was entirely adequate for this purpose. The hot cell already used has been disassembled with a new one to be constructed.

#### VIII. Equipment

The equipment, as used in the past, for source encapsulation, was not reviewed because of its disassembly. Neither was complete equipment set up for future encapsulation. The remote slave manipulators should be a great boon in design of the hot cell for keeping exposures to personnel low.

November 16, 1956

## IX. Instrumentation

A great variety of instruments were available for radiation survey purposes, including the AN/PDR-27A and C. These instruments have a range of 300 mr/hr. They also have small calibration sources of approximately 5 microcuries of Cobalt. Also, available was a scintillation type AN/PDR-18A and B. These instruments also had a calibration source of 100 microcuries of Strontium 90. For personnel monitoring, both dosimeters low and high range and film badges are used. Film badge processing is carried out under the supervision of Lt. Powell. An Ansco-MacBeth densitometer is used for density measurements and approximately 25 films are used as standards in establishing density versus radiation curves. A brief review of their film badge interpretation program indicated that they were taking the necessary steps to obtain appropriate readings. It was also learned that their film badge and high range dosimeter readings were in reasonably close agreement.

## X. Precautionary Procedures

All personnel are monitored with film badges and a low range and high range dosimeter. Blood counts are also kept on various personnel. Although monitoring devices are used routinely, several high exposures have occurred at this installation. It would appear that these exposures were due to two causes: Lack of proper precautionary measures in handling techniques and poor facilities for encapsulation. For instance, Lt. Powell had received cumulative doses of approximately 12 r since his arrival there in early 1955. High to weekly doses to Lt. Powell were as much as 2870 and 1620. These doses occurred on consecutive monitoring periods. Other high level doses were 642 and 598 mr per 2-weeks' period. A Sgt. Courtwright had received in a period of a year's time, better than 7 r. It was pointed out to both Col. Brice and Lt. Powell that these exposures levels were much higher than the AEC will permit under routine licensing, and that we would like very much to encourage them to take appropriate steps to correct subsequent exposures of this magnitude and that certainly exposures greater than 300 mr/wk should be of a non-routine nature and that individuals who have already obtained such high exposures be delegated to duties requiring little, if any, subsequent exposure until the over-all level of radiation could be brought to permissible averages. The 5 r per year, as recommended by the National Research Council, was discussed at some length and they were told that it may possibly be included in radiation protection standards that the AEC would adopt.

#### XI. Controlled Areas

All radiation at this institution is handled in controlled areas and for routine operations. Exposures to personnel are not excessive.

#### XII. Records

Personnel monitoring records were kept with cards set up for each individual, showing not only their periodic exposures, but their cumulative exposures during the entire time the trainee was on that post. This was true for trainees, as well as instructors and other personnel involved in the program. Records of receipt of material were also adequate.

#### XIII. Compliance with Regulations

Procurement of radioisotopes was in accord with limitations as provided for in their authorization. Material was located and used in such a way that individuals should not be overly exposed. However, there was certain nonroutine operations which we felt to offer unnecessarily high exposures to a few isolated personnel which has been discussed in more detail above.

#### XIV. Compliance with Conditions of License

As noted above, this institution does not yet have a license, and therefore, their program has not been tied to Part 20. They do have written procedures and the only exceptions are overexposures to personnel and the improper posting of radiation areas - using a symbol all their own. (See front page of SCP)

#### XV. Hazardous Conditions

The encapsulation of Cobalt at this institution in the past has offered considerable hazard to individuals. The facility has been dismantled and new facilities are to be constructed. It is hoped that with the new facilities for the encapsulation of radioisotopes, exposure to personnel will be greatly minimized. Col. Brice assured us that they would abide by AEC recommendations in the future.

#### XVI. Summary

The program at this institution is that of radiological warfare training of personnel. They expect to have in their possession approximately 6000 curies of Cobalt and various other isotopes

Army Chem. Corps School  
Ft. McClellan, Ala.

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November 16, 1956

but of much lesser magnitude. They have carried out encapsulation of Cobalt for radiological warfare studies and have had rather high exposures in several instances. Old facility for encapsulation has been disassembled and a new one proposed. It was recommended that they construct facilities which would minimize personnel exposures and that their sealing techniques be comparable to that used at ORNL. Lt. Powell stated that he planned to come to Oak Ridge both to review their new application for a license and sealing techniques at ORNL.

5/4/56

EVALUATION AND RECOMMENDATIONS

Institution: U. S. Army Chemical Corps School  
Fort McClellan, Alabama  
Address:

Category:  
RSB Representative, JWH - JNM  
Date of Visit: 11-9-56

Type of License		Pre-licensing	Reviewed by:
Limited	_____	First _____	RSB _____
Broad	_____	Repeat <u>X</u>	
Comprehensive	_____	Post-licensing	Licensing _____
General	<u>X</u>	First _____	
		Repeat _____	
		Special _____	

Conditions: Satisfactory; Marginal; Unsatisfactory; Not Applicable (S, M, U, NA)

- |                                    |                                      |
|------------------------------------|--------------------------------------|
| I. <u>M</u> Administrative Control | IV. <u>S</u> Personnel Monitoring    |
| II. <u>S</u> Material Licensed     | <u>M</u> Radiation Survey Procedures |
| <u>*S</u> Disposal                 | <u>S</u> Controlled Areas            |
| III. <u>U</u> Lab Facilities       | <u>NA</u> Non-controlled areas       |
| <u>U</u> Shielding                 | <u>M</u> Radiation Signs             |
| <u>M</u> Equipment                 | V. <u>S</u> Records                  |
| <u>S</u> Instrumentation           | VI. <u>S</u> Regulations             |
|                                    | VII. <u>S</u> Terms and Conditions   |

Critical Evaluations: (Summary of over-all program, discussion of specific marginal and unsatisfactory conditions with recommendations for corrective action.)

\* Disposal by burial on site was unauthorized. Received excessive exposure during encapsulation of Cobalt - inadequate equipment and shielding.

\_\_\_\_\_ Revisit is Recommended: (When)  
 11-20-56 Letter of Recommendation Sent to: Attn: Col. C. H. Wood, Chairman  
 (Date) Radioisotopes Committee

\_\_\_\_\_ Letter of Compliance Received From:  
 (Date)

**COMPLIANCE INSPECTION REPORT**

1. Name and address of licensee Department of the Army U. S. Army Chemical Corps School Ft. McClellan, Alabama	2. Date of inspection September 5-8, 1961 (4)
	3. Type of inspection <u>Reinspection</u>
	4. 10 CFR Part(s) applicable Parts 20, 30, and 70

5. License number(s), issue and expiration dates, scope and conditions (including amendments)

1-2861-1 - October 21, 1957 - October 31, 1958

Amendments

- No. 1 - January 20, 1958
- 2 - December 2, 1958 - November 30, 1960
- 3 - September 24, 1959
- 4 - February 9, 1960
- 5 - August 12, 1960
- 6 - April 11, 1961 - April 30, 1963

SNM-344 - January 4, 1960 - December 31, 1962

Amendments

- No. 1 - September 21, 1960 - December 31, 1962
- 2 - June 22, 1961 - June 30, 1964

6. Inspection findings (and items of noncompliance)

The licensee conducts an adequately controlled program for student instruction in radiological warfare. Control is exercised through a Health-Physics staff operating under an active Isotopes Committee. The committee is directly responsible to the licensee commandant for the safety of the radioisotope program. Detailed radiological safety procedures have been written and distributed to users. Personnel monitoring devices and adequate survey instrumentation are provided. According to the licensee, certain radioisotopes are possessed under licenses other than those issued to this licensee. The licensee performs surveys on a routine frequency. Records are maintained of receipts; inventory, and disposal; surveys; film badge assignments; film badge results; and committee actions.

The only items of noncompliance observed or otherwise noted during this inspection are:

License No. 1-2861-1

License Condition 16 - Except for Cobalt-60 sealed sources installed in the Radiological Training Area, Pelham Range, the following condition is applicable:

- A. Each sealed source acquired from another person and containing byproduct material with a half-life greater than 30 days and in any form other than gas, shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within 6 months of the date of acquisition, sealed sources shall not be put into use until tested. (Con't)

Colonel [Name] stated that he is not aware of the occurrence causing this spill. He stated there are no records existing with regard to the spill.

Student use is under the direct supervision of an approved user.

Condition 13 - Byproduct material and sealed sources shall not be opened. The licensee stated that he has not opened any sealed sources, however, with the completion of this hot cell, the licensee intends to make application for amendment to his license to permit reencapsulation of sealed sources.

Condition 14 - The licensee shall comply with representations of this license, application, dated 9/16/60 and memorandum dated 2/21/61 and Chapter 12 of the SOP Radiological Safety. For status of compliance, see details above.

Condition 15 - Notwithstanding Section 10 CFR 20.203(c)(2), Pelham Range need not be equipped with control devices. It shall be secured by a fence and by a patrolled road - Pelham Range is completely enclosed with padlock gates. A road surrounding Pelham Range is subject to patrol by mounted guards.

Condition 16 - With the exception of sources on Pelham Range, each sealed source shall be leak tested at intervals not to exceed six months and prior to use unless a certificate of leak test is obtained from the supplier; leak tests shall be sufficient to detect 0.005 microcuries of contamination - For compliance with this section, see details above.

Condition 17 - Sealed sources at Pelham Range will be leak tested so that 10% are tested at six month intervals; if any leaking sources are found within the initial 10% at any six month interval, an additional 10% shall be tested. If leaking sources are found in the second 10% tested, all sources shall be tested; all leaking sources shall be withdrawn and disposed of. For status of compliance, see details above.

20. Miscellaneous

a. As stated in Item 13, Page 8, there is embedded in the concrete pad surrounding the storage vault a stainless steel plaque on which is stamped "Caution - Radioactive Contamination; Location at a depth of 16 inches from top surface of concrete; Type - Strontium-90; Half-life - 19.9 years; 600 mr/hr on (7/28/59 at surface of spill". Colonel Colgin stated that he is not aware of the occurrence causing this spill. He stated there are no records existing with regard to the spill.



Oak Ridge, Tennessee  
July 19, 1957

IEB:JME

Colonel C. H. Wood, Chairman  
Radioisotope Committee  
Department of the Army  
Chemical Corp School  
Ft. McClellan, Alabama

Subject: APPLICATION FOR RENEWAL OF LICENSE

Dear Col. Wood:

There are a number of questions which we feel should be clarified before renewing your license, however, we had agreed with Capt. Coner to delay writing you until a copy of his report could be evaluated. We should, therefore, like to have a response from you regarding the following questions:

1. The area referred to as Pelham Field and reported to have a large number of Cobalt 60 sources located should be enclosed by a fence which is more restrictive than the few strands of barb wire now used. It is understood that the field is accessible to hunters during hunting season and perhaps other people who might wander through. Obviously, the precautionary measures being exercised would not indicate compliance with AEC regulations 10 CFR 20, Standards for Protection Against Radiation.
2. Procedures and methods by which encapsulation of sources will be carried out including type of sealant used in making the capsules leak proof.
3. Please indicate that all radioactive source holders will be labeled in accordance with AEC regulations, Paragraph 20.203.
4. Establish system containing inventory of each source so that its location and number of sources may be readily determined.
5. Discontinue the use of new burial ground if the amount of materials being disposed of are in excess of provisions of Paragraph 20.304 of AEC regulations until your procedures for such burial can be approved by the Commission.
6. Secure old burial ground against accessibility to children or small animals which may remove contaminated materials from burial ground.

July 19, 1957

7. Establish program for periodic inspections of sealed sources located at Pelham Field to determine leakage of radioactive material. If sources are leaking they should be re-encapsulated in a method which will prevent such leakage.
8. Present data on the protective aspects of your hot cell. Such data should include maximum amount of activity which will be stored or used at any one time in the cell and the dose level of radiation outside the cell where personnel will be working. Other areas outside the cell should be restricted in such a manner as to meet the requirements of 10 CFR 20 on personnel exposure.
9. Please indicate that all source containers will be labeled in such a manner as to identify the radioisotope and quantity as of a certain date.

It has been reported that Lt. Powell will be leaving Ft. McClellan and will be replaced by another individual. We should like to have the name of the individual who will act as Radiological Safety Officer and any other changes which may have occurred in your radioisotope committee since submitting your application of April 10.

It was understood during my recent visit to Ft. McClellan that a new Standard Operating Procedure was being drafted. The present Standard Operating Procedure dated April 1953 appears to be inadequate to cover your presently expanded operation.

Upon receipt of the above requested information we shall be pleased to continue our review of your application.

Very truly yours,

J. W. Hitch, Assistant Chief  
Hyproduct Licensing  
Isotopes Extension  
Division of Civilian Application

cc: Col. John R. Hall, Surgeon General Office  
Washington, D. C.

Hitch/opc/ms

xgwyj/25

Isotopes

7/19/57

24 July 1957

Mr. J. W. Hitch, Assistant Chief  
By Product Licensing  
Isotopes Extension  
Division of Civilian Application  
Oak Ridge, Tennessee

Dear Mr. Hitch:

In the absence of Col Wood, I am replying to your letter of July 19, and will attempt to answer specifically the questions you have included in this letter. I am also including a copy of Col Wood's letter (approved by him prior to his departure). You should be receiving the original at about the same time you receive this.

1. We do not believe that the Pelham Field area is accessible to hunters. This is a general restricted toxic area, and is also used for gas tests. Hunting passes are never issued for this area and if hunters ever wander into this area they are clearly entering restricted areas that are so marked. We are at this time improving the fences, making the area more restrictive, and will, of course, comply with your suggestions. We feel, however, that we need to discuss this with you at a conference at Oak Ridge in the near future.

2. Presently, it is anticipated that a brass capsule with a screw type cap will be utilized for encapsulation. The cap will be soldered in place after filling. A sample of this capsule will be shown during our contemplated visit with you.

3. All sources will be labeled in accordance with AEC regulations. I invite attention to the comments on Col Wood's letter.

4. An inventory system will be established so that each source and its location can be readily determined. The system now in use will be discontinued after we have finished labeling our sources in accordance with AEC regulations, Par 20.203 and the new inventory system set into operation.

OMLTC-8-8  
Mr. J. W. Hitch

24 July 1957

5. The use of the new burial ground has been discontinued pending approval of this new site by the Commission. This has required us to stop our decontamination operation on the old burial ground, after reaching a radiation level of less than 5 mr/hr.

6. The old burial ground has been secured as requested.

7. A program for periodic inspections of sealed sources has been initiated and will continue on a systematic basis. We have not yet detected leakage. All sources will be re-encapsulated by a method which will prevent leakage. We believe that it would be much better to proceed with our re-encapsulating of Palham Field sources as soon as possible, and not wait for leakage to be discovered.

8. Present data on the protective aspects of the temporary hot cell indicates that no more than 40 curies of  $Co^{60}$  were handled at a time except during a transfer operation. During a transfer operation no individual received more than 25 mr. At other times during the loading operation the dose rates received by operating personnel varies between 6-10 mr/hr. At some distance from the hot cell the scatter causes readings to reach a maximum of 25 mr/hr. However, no personnel are allowed to occupy this area during the encapsulation. The entire area is off limits to unauthorized personnel and no one except those engaged in the actual encapsulation are allowed in the area.

9. All source containers will be labeled in such a manner as to identify the radionuclide and quantity as of a certain date. The date for completing this has not been determined at this time because of certain questions as to the method of marking the source containers. I invite your attention to Col Wood's comment on this. I believe that we can specify a date for completion of this job after we have talked with you.

Lt Victor V. Johnson will replace Lt Powell as Radiological Safety Officer. He will be assisted by Lt Roy A. Vaillant, who has just reported for duty. Lt Vaillant has a B.S. degree in Chemical Engineering from Georgia Institute of Technology. As soon as Lt Vaillant has demonstrated his capability he will be considered for membership on the isotope committee. Captain Archie L. Stanger has replaced Captain Robert Hibernahl as a member of the isotope committee and will be the Deputy Chief of Health Physics. In the temporary absence of Lt Johnson, Captain Stanger will serve as Radiological Safety Officer. The qualifications of Captain Stanger are inclosed.

GM/TC-8-8  
Mr. J. W. Hitch

24 July 1957

It is anticipated that a member of our Staff will visit Dr. Anderson for an on-the-job training cycle if such details can be worked out during our anticipated visit to Oak Ridge. This would insure that our personnel are thoroughly familiar with the techniques employed by the Health Physics group there. It has been customary that we keep at least one member of our Staff trained in Health Physics procedures by Dr. Anderson and her staff.

The new Standard Operating Procedure will be in final form on our contemplated visit to your establishment in August 1957.

- 2 Incl  
1. Cy of Col Weed's ltr.  
2. Qualifications of  
Capt Stamper.

JOHN B. BEACH, Major, CmC  
Chief, Health Physics  
US Army Chemical Corps School

## ANNEX I

**Summary of Action on Recommendations made in  
Report of Radiation Protection Survey No. 2672R75-57, 27-28 May 1957  
by Inspecting Team, US Army Environmental Health Laboratories,  
Army Chemical Center, Maryland**

Para 5a. All radioactive sealed sources are to be labelled as soon as practicable, either by tagging or stamping. It is anticipated that a visit to Oak Ridge will be accomplished in the very near future to finalize and coordinate methods of labeling. Information on label will include serial number, radiation caution symbol, curieage and date of curieage determination.

Para 5b. All source holders will be labeled in accordance with paragraph 20.203 of the AEC Regulations as soon as practicable. In the interim period, regulations as specified by the inspection group of the Environmental Health Laboratories will be complied with.

Para 5c. Upon completion of work required in 5a, above, an inventory on specific sources will be established in accordance with AEC Regulations. Current records are not wholly adequate in this regard.

Para 5d. Leakage tests have been conducted on all sealed radium sources and random sampling of all other sources has been accomplished as required. These tests have all shown negative results. Periodic 3 month inspections will be made and records of test results maintained.

Para 5e. Tentative plans have been drawn up for improved "Hot Cell" facilities and these will be discussed in detail with the AEC officials during our forthcoming visit with them. Any AEC specifications for an official standard design for "Hot Cell" facilities, will be incorporated insofar as budgetary limitations permit. During the interim period, the existing temporary "Hot Cell" with recommended modifications, will continue to be used for conducting required tests. Health Physics personnel will insure proper safety precautions for operations during this period.

Para 5f. Action has been accomplished.

Para 5g. All contaminated material not being used for training purposes has been decontaminated. Items of equipment being used primarily for training purposes are kept in an area accessible only to authorized personnel and the area is conspicuously marked with warning signs.

Para 5h. The proposal to place a barbed wire enclosure around the radiation area within Falham Field does not lend itself to our training requirements. The alternate proposal calling for a 7' chainlink fence is beyond our budgetary capabilities at this time. We plan to discuss this problem in detail with the AEC officials during our forthcoming visit.

Para 5i. Random samples have been removed from the Pelham Range area and checked for leakage. No sign of leakage or deterioration was evident. Random sampling for leakage will be made every 3 months and records of data maintained. It is planned that all the sources will be removed from Pelham Range and reencapsulated as soon as a proper design of capsule and facilities are made available.

Para 5j. Concur. Capsule design will be discussed with AEC officials during the forthcoming visit.

Para 5k. Action has been initiated for the preparation of a storage site and the procurement of material therefor. The design of the storage facility will meet AEC's specification on allowable dose rate levels. Furthermore, consideration is being given to improvement of present storage facilities as a temporary measure. The plans for storage facilities which are to be constructed in conjunction with our "hot cell" will be discussed during the forthcoming visit with AEC officials. This site is presently inaccessible to unauthorized persons.

Para 5l and para 5n. Decontamination processes are near completion (but require coordination with AEC for final completion.) Present radiation levels are less than 5 mr/hr. To accomplish decontamination to an acceptable level (less than 1 mr/hr) will require that a large amount of earth be removed and taken elsewhere. The most practicable solution appears to be to enlarge the new storage area at Pelham Range. The old contaminated area is being made as inaccessible as possible through the use of barbed wire (concertina) and marked.

Para 5n. Material is presently being procured for the fencing of the new burial ground. This project will be completed as soon as these materials are available. Markings as required by AEC will be provided after the erection of fencing. Temporary markings are in use at present.

Para 5o. Accomplished. A request for the continued use of the new burial ground site has been forwarded to OCCCIO.

Para 5p. Plans have been made to have students wear two film badges on test occasions and for one set to be sent to Lexington Signal Depot for processing and the other set of badges to be processed at the US Army Chemical Corps School. The results will be correlated and used as a control on procedures and techniques.

**Captain Archie L. Stanger - Member**

<b>Associate Field Artillery Battery Officer Course The Artillery School, Fort Sill, Oklahoma (3 months)</b>	<b>1950</b>
<b>Eastern Kentucky State College (Chemistry and Mathematics)</b>	<b>B.S. 1947-1951</b>
<b>Associate Anti-Aircraft Artillery Battery Officer Course The Anti-Aircraft Artillery and Guided Missiles Center Fort Bliss, Texas (4 months)</b>	<b>1951</b>
<b>Photo Interpretation Course, The Intelligence School, Fort Riley, Kansas (3 months)</b>	<b>1952</b>
<b>Staff Chemical Officer, 1st Cavalry Division, Japan</b>	<b>1954-1955</b>
<b>University of Virginia (Physics)</b>	<b>M.S. 1955-1957</b>
<b>Instructor, Physics, U.S. Army Chemical Corps School, Fort McClellan, Alabama</b>	<b>July 1957</b>

**LT. V. V. JOHNSON - MEMBER (Recorder)**

<b>Washington State College (Chem Eng)</b>	<b>BS 1956</b>
<b>Hanford Atomic Works (5 months)</b>	<b>1956</b>
<b>Chemical Officer Basic Course, The Chemical Corps School</b>	<b>1956</b>
<b>Instructor, Health Physics - The Chemical Corps School</b>	<b>1956-1957</b>

1085

OFFICE VISIT OF COLONEL CE L H. WOOD, CAPTAIN ARCHIE L. STAMPER, 1st LIEUTENANT  
CONRAD M. KNIGHT, U. S. ARMY CHEMICAL CORPS SCHOOL, FORT MCCLELLIAN, ALABAMA,  
ON AUGUST 7, 1957.

JWH, JEB, LPG AND DS met with Colonel Cecil H. Wood, Captain Archie L. Stamper,  
1st. Lieutenant Conrad M. Knight, U. S. Army Chemical Corps School, Fort McClellan,  
Alabama concerning Control No. 5359 (Application for broad specific Byproduct license  
for research and development).

The following are items that were discussed:

1. Multicurie cell

The U. S. Army Chemical Corps School has a multicurie cell of temporary construction.  
This cell is located near the Training School. They have proposed building a permanent  
type multicurie cell and storage facilities and locating this installation at Pelham  
Field. The temporary hot cell would then be used only for low activity radioisotopes.  
The encapsulation of high activity sources would be performed at the permanent hot cell  
located at Pelham Field. It was suggested that they contact the Budd Company, Nuclear  
Division, Philadelphia, Pennsylvania regarding hot cell design. They were advised  
to determine the capacity of their new hot cell as well as their temporary hot cell by  
placing a relatively strong source in the hot cell and making radiation surveys around  
the cells.

2. Radiation

Pelham Field<sup>5</sup> is surrounded by a two strand barbed wire fence, but is accessible to hunters.  
It was agreed that the radiation area would be additionally enclosed by<sub>4</sub> hog fence with  
3 strands of barbed wire on the top. This area will be posted with radiation signs  
stating: "Danger - High Radiation Area - Keep Out." The vegetation along the fence  
will be destroyed by chemicals, and a jeep road bulldozed along the fence, and a regular  
patrol established

### 3. Burial

They have a burial ground in which considerable radioactive material of unknown activity, isotope or form has been buried. The Surgeon General's office has ordered them to discontinue all burial until further approval. We requested that this area be posted and enclosed as promptly as possible by a fence small enough to keep out small animals such as dogs. They are considering removing all contaminated earth from this area. To where, they did not say. It was suggested that they determine the half life of the contamination and consider the possibility of waiting for normal decay. A proposal to bury radioactive wastes in a new burial ground has been submitted to the Chemical Supply Command, but it was felt that the proposal would be rejected. All burial of radioactive wastes has ceased.

### 4. Encapsulation fo Sealed Sources

They presently have 400-750 Cobalt 60 sources which are encapsulated but are not sealed. These will gradually additionally be encapsulated into a brass capsule with a screw type cap and soldered with low temperature silver solder. These will be labeled in accordance with our standard recommendations. Sources which will be used outside exposure devices will also be tagged according to our recommendations. It was agreed that they would leak test about 5% of their old sources as soon as possible. If leakers are ~~found~~ found, all will be leak tested, otherwise only periodic spot checks will be made. All leaking sources will be promptly encapsulated in additional capsules, while non leakers will be additional be encapsulated over a period of several years.

### 5. Records

At the present time they have no records concerning leak testing, number of sources, or burial of radioactive wastes. Upon Lieutenant Powell's return they will make a more extensive search for such records since Col. Wood feels there were at least some such records kept by Lt. Powell's predecessor. They will also establish a suitable record system for the future and make as good of an estimate as possible of their

present  
possession.

6. Standard Operating Procedures

A revised draft of Fort McClellan's standard operating procedures has been submitted for our review and comments.

Arrangements were made for Colonel Wood and his junior officers to visit Oak Ridge National Laboratory to discuss various hot cell designs and talk with Dr. Anderson concerning on-the-job training for Lieutenant Knight.

(JWH)  
8-12-57

*Pending  
ajp*

Office visit with Fort McClellan, Alabama personnel on 8-7-57.

A meeting was held with Colonel C. H. Wood, Chairman, Radioisotope Committee, Captain A. L. Stamper and Lt. C. M. Knight. Colonel Wood was the only member of the group on the isotopes committee, however, Colonel Wood pointed out that Captain Stamper would replace Captain Robert Habermehl and possibly Lt. Knight would also be added to the committee at some future date. Personnel from this office who sat in on this meeting were JEB, LMG and DAS.

Colonel Wood brought a copy of their new SOP which was briefly reviewed during the time of their visit. It was pointed out that some additions should be made to this SOP but we would cover those in a letter. It was also pointed out that Lt. Powell who is now in Indian Rock, Nevada, would probably be returning to Fort McClellan but there was no definite assurance of that at this time.

Hot Cell: The hot cell which they had furnished us photos of in their application was reviewed, however, Colonel Wood stated they intended to build a more permanent type. They asked for information on concrete mixtures, materials and general designs which would be satisfactory in designing the hot cell. Several pieces of information and references were given to them for this problem. It was pointed out that we would like to know the effectiveness of the sealing in any hot cell, whether applied on basis of new cell or basis of temporary block cell. They could obtain these figures by placing a relatively large source inside the cell and then making measurements in areas surrounding the cell where personnel would be located. The advantages of a closed cell at the top were discussed and problems of scatter radiation which might be encountered with an open top cell. Colonel Wood hopes to complete their new application including information on hot cells prior to expiration of their present authorization which was extended to October 31, 1957.

Pelham Field: It was determined that this area which is located in a wooded section several miles from the Chemical Corps School, contained approximately 450 sources of cobalt located in as many wells in this area. The activity in each source varies from 4 to 8 curies, however, the institution has no definite records that can determine the actual activity of the sources. These wells are source holders and are described in the pending application and are approximately 25 to 30 feet apart. It was also learned that the sources have been lifted in the Pelham Area and are lifted for weeks at a time in order to minimize exposure to operating personnel between training maneuvers. The radiation levels in this field may be several hundred mr/hr at some locations. At the present time there is no immediate fence around the Pelham Field training area. However, a more extensive area including this field is fenced with barb wire and posted as a government reservation. It was pointed out to Colonel Wood and his party that the type of fencing used was not satisfactory to prevent unnecessary exposure to personnel who may wander into this area. Colonel Wood agreed that additional fencing would be constructed at a point away from the field where the radiation level would not be more than 2 or 3 mr/hr. They asked us what type of fence we would accept. It was suggested that they use some type of hog wire which would minimize entry of small animals and surmount this fence with 4 or 5 strands of barb wire and in addition the fence would be posted

at every 15 or 20 feet with a radiation sign similar to the one submitted on their application. It was pointed out that this sign should also indicate danger rather than the word caution as presently stated on the sign. This fence would be surrounded by control road and entry would be blocked greatly.

Method of Encapsulation: The method by which sources are encapsulated at Pelham Field have not been entirely satisfactory in the past, however, they agreed to take some old sources, now located at Pelham Field, and carry out leak test studies to determine sources are not leaking. Less than  $\frac{1}{2}$  dozen sources have been tested to date and no leakage determined. Suggested that they still continue to carry out leak test on some of the older sources until a more thorough test could be made. Several capsules were brought to Oak Ridge and measured by the Isotopes Extension. It was pointed out that these capsules which were a bronze and stainless steel, would be satisfactory if sealed with a silver-bearing solder. They propose to take a look at ORNL source sealing technique during the afternoon while visiting the laboratory. Methods of labeling and serializing sealed sources were discussed in considerable detail. The possibility of tagging sources in the Pelham Field Area with information which would identify such sources was also discussed.

Records: It was pointed out to Colonel Wood that their record system for personnel exposure was satisfactory, however, records kept on sources, their location, quantity of activity and how such sources were identified, were not satisfactory for AEC requirements. Colonel Wood stated that they were completely re-looking at their record keeping system and felt that the new system they were thinking of coming up with would be entirely satisfactory with AEC.

Burial Ground: It was pointed out that their old burial ground was fairly close to new residential buildings and although they had made efforts to decontaminate the burial ground, they have found that complete decontamination involved quite a problem. For instance, the field may show no activity at the surface but the dirt piled up in an ant hill may have radiation levels as much as 5 mr/hr at the surface. It was pointed out that children playing in such an area or even household pets digging in contaminated dirt was unfair-able and measures should be established to prevent entry to the area. After determining that the field is on relatively high ground and not particularly subject to erosion, it was suggested that the area be fenced and posted in such a manner as to prevent entry by children or pets. However, if the radio-isotope contaminate was of long half-life it may prove necessary to take more drastic measures. It is their feeling that the contaminate is Tantalum 182 - 115 days half-life and ~~mean~~ that the contaminated ground may soon decay.

With regard to the new burial ground, it was agreed that they would dis-continue burial in this ground until approval from the Chemical Corps Material Command and AEC could be obtained, however, Colonel Wood pointed out he did not believe approval would be obtained from the Chemical Corps Material Command. If approval is not obtained, contaminated equipment and other radio-active waste will be sent to the Edgewood Chemical Center, Maryland for disposal.

Page 3 (Office visit with Fort McClellan, Alabama personnel)

Standard Operating Procedures: The present SOP draft is being reviewed by DMS and LPO and comments will be sent to Colonel Wood as soon as complete.

Summary: The general scope of this visit was quite satisfactory, the proposals as suggested by Captain Coner as the result of his visit on May 28, are generally being adhered to and additional measures are being taken to comply with Captain Coner's requirements.



*J*

HEADQUARTERS  
U. S. ARMY ENVIRONMENTAL HEALTH LABORATORY  
of the Army Medical Service  
Army Chemical Center, Maryland

MEDEI-R 726.2

SUBJECT: Report of Radiation Protection Survey No. 2672R75-57

TO: The Surgeon General, Department of the Army, Washington 25, D. C.  
ATTN: MEDGE-OH  
Chief Chemical Officer, Department of the Army, Washington 25, D. C.  
ATTN: CMLTC-T-2  
Commandant, The Chemical Corps School, Chemical Corps Training Command,  
Fort McClellan, Alabama  
ATTN: CMLTC

Transmitted herewith is Report of Radiation Protection Survey prepared by this Laboratory citing the authority and containing results of survey and recommendations.

*Edward J. Dehne*  
EDWARD J. DEHNE  
Lt Colonel, MC  
Commanding

HEADQUARTERS  
U. S. ARMY ENVIRONMENTAL HEALTH LABORATORY  
of the Army Medical Service  
Army Chemical Center, Maryland

MEDEI-R 726.2

REPORT OF RADIATION PROTECTION SURVEY NO. 2672R75-57  
THE CHEMICAL CORPS SCHOOL  
CHEMICAL CORPS TRAINING COMMAND  
FORT MCCLELLAN, ALABAMA  
27, 28 MAY 1957

1. AUTHORITY.

a. AR 40-557.

b. Letter, CMLTC-S-8333, The Chemical Corps School, 11 April 1957, subject: "Inspection of Radiological Facilities" to The Surgeon General, and indorsements thereto.

2. PURPOSE. The purpose of this survey was to accomplish the following objectives:

a. Evaluate the existing and potential hazards to health resulting from the use, storage and disposal of radioactive material.

b. Determine whether or not the radiologic protection program was being operated in accordance with the recommendations of the National Committee on Radiation Protection and Measurements, pertinent Army Regulations and the Atomic Energy Commission regulations published in Chapter 1, Title 10 of the Federal Register.

c. Recommend necessary action to decrease needless exposure to ionizing radiation and to insure that the radiologic protection program is in consonance with pertinent regulations.

3. REFERENCE. Letter, CMLTC-S-8680, Commandant Chemical Corps School, 31 Jan 57, subject: "By-product License" to The Surgeon General.

4. FINDINGS.

a. Radioactive material was used by the Chemical Corps School for training purposes and for research and development studies. The quantity and identity of the radioactive material is listed in an inclosure to the letter cited in paragraph 3 of this report. The organization and operational procedures of the Health Physics Group are shown in "Standing Operating Procedures - Work Involving Radiation Hazards" which is Inclosure #1 to this report. The school maintains its own film badge radiation monitoring service.

b. The radiologic protection program was found to be in consonance with the recommendations of the N.C.R.P., pertinent Army Regulations and the AEC regulations except as noted below:

(1) The radioactive sealed sources were not labelled with radiation caution symbols nor was the quantity or identity of each source determinable by visual inspection.

(2) Several source holders in the storage area were not labelled as required by AEC regulations (see Par 20.203, Federal Register).

(3) An inventory of specific sources was not maintained.

(4) The radium sealed sources were not periodically tested for leakage.

(5) The "hot cell" located in the school building was of temporary construction. The walls were made of dry-stacked concrete block extending to a height of approximately eight feet. There was no protective enclosure on the top side of the cell. When large curiage sources were handled the radiation scattered over the top of the cell walls resulted in a high exposure within the adjacent class room. The exposure in the adjacent storage area was also of sufficient magnitude to warrant restriction of the area when large curiage sources were being handled. The maximum transmitted and scattered radiation exposure rates, outside the cell, per curie of Cobalt 60 located at the most hazardous practical positions inside the cell, were not known by the operating personnel. The health physics personnel established occupancy limits in adjacent areas based on the findings of a radiation survey each time a new "hot cell" operation was established.

(6) There were two trailers located in the Storage Area which were suspected by the school health physics personnel of being contaminated. The trailers were not posted with caution signs.

(7) The area within Pelham Field where a pattern of Cobalt 60 sources were located was restricted by a two or three strand barbed wire fence which was posted with Field Area Markings (see Operational Directive No 4 in Incl #1). The entrance to the area was closed by a suspended rope and a warning sign. The pattern of Cobalt 60 sources was used to simulate a high exposure fall-out area. Students equipped with radiation rate meters and radios were trained in establishing radiation contours around the pattern under the direct supervision of school personnel. The pattern was also used for research and development studies. The 3750 curies of Cobalt 60 used in the pattern was contained in approximately 750 capsules. The sources ranged in curiage from 40 to 6 curies in each capsule. They were encapsulated in nonhermetically sealed galvanized iron pipes. The capsule source holders were pipes set vertically in the ground as shown below:

(10) A new burial ground was being established within Pelham Field. At the time of the survey it was not fenced and posted but the materials for fencing and posting were on hand. Approval of this burial site had not been obtained from either the AEC or the Commanding General, Chemical Corps Materiel Command.

5. RECOMMENDATIONS.

yes  
a. Label all radioactive sealed sources with serial numbers and radiation caution symbols; identify the radioactive material and specify the curiage and date of curiage determination.

yes  
b. Label all radioactive source holders as required by paragraph 20.203 of the AEC regulations.

yes  
c. Maintain an inventory of specific sources so that the location of each numbered source may be readily determined.

yes  
d. Conduct leakage tests of all radium sealed sources and other radioactive sealed sources as required by AEC regulations. The radium sources should be tested every 3 months. Records of test results should be maintained.

yes  
e. Construct a permanent, completely enclosed, "hot cell". The barriers should be of uniform density. Radiographic examinations should be made of all structural joints. The barriers should be of sufficient thickness to reduce the exposure rate at any accessible area outside the cell to not more than 100 milliroentgens per 40-hour-weekly-work-shift when the maximum anticipated quantity of the highest energy emitter likely to be handled is positioned in the cell in the most hazardous practical location. The curiage handling capacity of the cell should be posted in view of the operator so that he may know when operational time should be limited to prevent overexposure. Provisions should be made in the design of the cell for the routine or emergency handling of radioactive material which presents an internal radiation hazard.

yes  
f. Post conspicuous signs on all contaminated material and store the material in a safe place.

g. Decontaminate all contaminated material which is not being used for training purposes.

yes  
h. Either erect a 7' high, chainlink fence, or equal, around the present radiation area within Pelham Field; post the fence with signs as required by paragraph 20.203(c) of AEC regulations; and lock the entrance,

or lock the entrance to the present barbed wire enclosure; erect an additional fence around the sources at such a distance that the exposure rate at the fence line does not exceed 300 mr/hr; post the fence with signs as required by paragraph 20.203(c) of AEC regulations; and indicate the exposure rates on the signs.

Conferees from Oak Ridge, Tenn: Mr. Hitch, Mr. Bowyer, Mr. Smith, Mr. Gintz.

Conferees from the US Army CmlC School: Col Wood, Capt Stamper and Lt Knight.

All references are to Report of Radiation Protection Survey No. 2672R75-57.

Par 5a, b: With regard to labelling radioactive sealed sources and source holders, it was recommended that a yellow metal tag be fabricated locally containing the following information:

AEC 3 blade symbol (Color Magenta)  
Danger Radiation Material (Magenta)  
Source (i.e., Cobalt 60)  
Serial Number CCS \_\_\_\_\_ (locally devised)  
Notify \_\_\_\_\_ if found

Par 5c: Reference inventory of specific sources at Pelham Range. It was recommended that the best practical estimate of the intensity and characteristics of sources at Pelham Range be made. The inventory should indicate location, identity of source, the average curriage per source and the maximum curriage.

Par 5d, 1: With regard to conducting leakage tests, AEC states that the By-Products Licensing Branch is not responsible for radium in any form but only for artificially produced isotopes. 5-10% of the sources selected at random at Pelham Range should be tested for leakage.

Par 5e, k: Construction of a permanent "hot cell" was discussed with:

Mr. J. H. Gillette	Isotope Sales Dept
Mr. Blauer	" " "
Mr. Lamb	" " "
Mr. J. A. Jones	Hot-Cell Operator

An estimate of \$70,000 was given for materials for the construction of a permanent "hot cell", designed for handling the school's working curriage. It was recommended that the storage cell be located as near as possible to the "hot cell." A suggested designing and constructing firm is:

The Budd Company  
Nuclear Systems Division  
Radiation Facility  
2450 Hunting Park Avenue  
Philadelphia 32, Pennsylvania  
ATTN: Mr. A. J. Stevens  
Mr. A. Deutsch  
Mr. C. F. Thompson

NOTES ON CONF HELD AT OAK RIDGE, TENN., 7 AUG 57

Mr. Hitch recommended that Colonel Wood visit a "hot cell" recently built by the Budd Company, in Philadelphia, which is the nearest in design characteristics to the kind that we would need.

Mr. Hitch requested a survey of our present "hot cell", with an average working source inside to determine the dose-rate in the working area, and that the results be sent to him.

Par 5f, g: New type signs have been completed, and await posting.

Par 5h: Fencing of Pelham Range:

It was recommended that a 4-foot hog wire topped by 3 strands of barbed wire fence be constructed around the sources at Pelham Range. The hog wire is to keep out small animals and the barbed wire is antipersonnel. It was stated that it will not be necessary to reincapsulate the sources or lower the sources daily if such a fence is constructed. Vegetation should be kept under control in the inclosed area. The fence should be on the inside edge of a fire trail or bull dozer road around the fence. The radiation level at fence should be no higher than 3 mr/hr.

Par 5l, m: Fencing of Rattlesnake Gulch:

It will not be necessary to decontaminate the old burial area if it is found that the material buried there has a half-life of less than 1 year. In any event, a fence should be constructed to keep children and animals away. Sgt Bond, School Supply, gave the following prices for fencing materials:

Hog wire, 4', 2" hexagonal, 150' roll	\$ 7.12/roll
Barbed wire, 2 point, 3" center, 1,000' roll	21.20/"
Chain link, 8', 2" mesh	1.01/ft
Barbed wire post, 6'	1.45/ea
Chain link post, 8'	1.16/"

In our application for license, we must include a statement that we will: control old burial grounds by fence and posting sufficient to keep out pets and children; analyze and forward findings of the soil at Rattlesnake Gulch; discontinue use of new burial ground pending approval; (Our license will be issued without permission to bury. We may then apply for an amendment to authorize burial providing our burial request is approved by MATCOM.); perform a survey of existing "hot cell."

Two copies of the draft SOP were left with Mr. Hitch. They are going to study them and send us their comments. Certain additions to the SOP were suggested by individuals at Oak Ridge, Tenn. They are as follows:

NOTES ON CONF HELD AT OAK RIDGE, TENN., 7 AUG 57

- (1) Procedures for burial.
- (2) Responsibility of Isotope Committee for enforcing safety.
- (3) Inclusion of specific instructions to trainees entering Pelham Field.
- (4) The Federal Register should be referenced for dosages.
- (5) Dosages for minors (under 18 years of age) should be included in the SOP. (See 20.101c FR).
- (6) Procurement procedures.
- (7) Incapsulation procedures.

HEADQUARTERS  
U. S. ARMY ENVIRONMENTAL HEALTH LABORATORY  
of the Army Medical Service  
Army Chemical Center, Maryland

MEDEI-R 726.2

17 Jun 1957

SUBJECT: Report of Radiation Protection Survey No. 2672RT5-57

TO: The Surgeon General, Department of the Army, Washington, D. C.  
ATTN: MEDCE-OH  
Chief Chemical Officer, Department of the Army Washington, D. C.  
ATTN: CMLCU-T-2  
COMMANDANT, The Chemical Corps School, Chemical Corps Training  
Command, Fort McClellan, Alabama  
ATTN: CMLTC

Transmitted herewith is Report of Radiation Protection Survey prepared by this Laboratory Citing the authority and containing results of survey and recommendations.

/s/ Edward J. Dehne  
/s/ EDWARD J. DENNE  
Lt Colonel, MC  
Commanding

HEADQUARTERS  
U. S. ARMY ENVIRONMENTAL HEALTH LABORATORY  
of the Army Medical Service  
Army Chemical Center, Maryland

MEDEL-R 726.2

REPORT OF RADIATION PROTECTION SURVEY NO. 2672R75-57  
THE CHEMICAL CORPS SCHOOL  
CHEMICAL CORPS TRAINING COMMAND  
FORT MCCLELLAN, ALABAMA  
27, 28 May 1957

1. AUTHORITY.

a. AR 40-557.

b. Letter, CMHC-3-5333, The Chemical Corps School, 11 April 1957, subject: "Inspection of Radiological Facilities" to The Surgeon General, and endorsement thereto.

2. PURPOSE: The purpose of this survey was to accomplish the following objectives:

a. Evaluate the existing and potential hazards to health resulting from the use, storage and disposal of radioactive material.

b. Determine whether or not the radiologic protection program was being operated in accordance with the recommendations of the National Committee on Radiation Protection and Measurements, pertinent Army Regulations and the Atomic Energy Commission regulations published in Chapter I, Title 10 of the Federal Register.

c. Recommend necessary action to decrease needless exposure to ionizing radiation and to insure that the radiologic protection program is consonance with pertinent regulations.

3. REFERENCE. Letter, CMHC-S-5530, Commandant Chemical Corps School, 31 Jan 57, Subject: "By-product License" to The Surgeon General.

4. FINDINGS.

a. Radioactive material was used by the Chemical Corps School for training purposes and for research and development studies. The quantity and identity of the radioactive material is listed in an inclosure to the letter cited in paragraph 3 of this report. The organization and operational procedures of the Health Physics Group are shown in "Standing Operating Procedures - Work Involving Radiation Hazards" which is Inclosure #1 to this report. The school maintains its own film badge radiation monitoring service.

b. The radiologic protection program was found to be in consonance with the recommendations of the N.C.R.P., pertinent Army Regulations and the AEC regulations except as noted below:

(1) The radioactive sealed sources were not labelled with radiation caution symbols nor was the quantity or identity of each source determinable by visual inspection.

(2) Several source holders in the storage area were not labelled as required by AEC regulations (See Para 20.203, Federal Register).

(3) An inventory of specific sources was not maintained.

(4) The radium sealed sources were not periodically tested for leakage.

(5) The "hot cell" located in the school building was of temporary construction. The walls were made of dry-stacked concrete block extending to a height of approximately eight feet. There was no protective enclosure on the top side of the cell. When large curiage sources were handled the radiation scattered over the top of the cell walls resulted in a high exposure within the adjacent class room. The exposure in the adjacent storage area was also of sufficient magnitude to warrant restriction of the area when large curiage sources were being handled. The maximum transmitted and scattered radiation exposure rates, outside the cell, per curie of Cobalt 60 located at the most hazardous practical positions inside the cell, were not known by the operating personnel. The health physics personnel established occupancy limits in adjacent areas based on the findings of a radiation survey each time a new "hot cell" operation was established.

(6) There were two trailers located in the Storage Area which were suspected by the school health physics personnel of being contaminated. The trailers were not posted with caution signs.

(7) The area within Pelham Field where a pattern of Cobalt 60 sources were located was restricted by a two or three strand barbed wire fence which was posted with Field Area Markings (See Operational Directive No. 4 in Incl #1). The entrance to the area was closed by a suspended rope and a warning sign. The pattern of Cobalt 60 sources was used to simulate a high exposure Fall-out area. Students equipped with radiation rate meters and radies were trained in establishing radiation contours around the pattern under the direct supervision of school personnel. The pattern was also used for research and development studies. The 3750 curies of Cobalt 60 used in the pattern was contained in approximately 750 capsules. The sources ranged in curiage from 40 to 6 curies in each capsule. They were encapsulated in nonhermetically sealed galvanized iron pipe. The capsule source holders were pipes set vertically in the ground as shown below:

The sources were purposely unmarked and relatively inconspicuous when they were in the irradiation position. When they were in the "safe" position within the stand pipes each source was locked and its location indicated by a Field Area Marking. The standpipes were not designed so that rainwater and condensed moisture could drain out. It was reported that the general Pelham Field area was opened to hunters in season.

(8) The storage facilities were inadequate in size and design. The ambient exposure rate within the storage building was 100 to 500 mr/hour. In general it would not be possible to obtain any source from the storage area, except those located just inside the doorway of the storage building, without being in at least a 100 mr/hr field.

(9) The old radioactive material burial ground, known as "Battle-snake Gulch," was found to be generally contaminated. It was nominally posted and fenced. Within sight of the burial ground was a housing area.

(10) A new burial ground was being established within Pelham Field. At the time of survey it was not fenced and posted but the materials for fencing and posting were on hand. Approval of this burial site had not been obtained from either the AEC or the Commanding General, Chemical Corps Materiel Command.

## 5. RECOMMENDATIONS.

a. Label all radioactive sealed sources with serial numbers and radiation caution symbols; identify the radioactive material and specify the curieage and date of curieage determination.

b. Label all radioactive source holders as required by paragraph 20.203 of the AEC regulations.

c. Maintain an inventory of specific sources so that the location of each numbered source may be readily determined.

d. Conduct leakage tests of all radium sealed sources and other radioactive sealed sources as required by AEC regulations. The radium sources should be tested every 3 months. Records of test results should be maintained.

e. Construct a permanent, completely enclosed, "hot cell." The barriers should be of uniform density. Radiographic examinations should be made of all structural joints. The barriers should be of sufficient thickness to reduce the exposure rate at any accessible area outside the cell to not more than 100 milliroentgens per 40-hour-weekly-work-shift when the maximum anticipated quantity of the highest energy emitter likely to be handled is positioned in the cell in the most hazardous practical location. The curieage handling capacity of the cell should be posted in view of the operator so that he may know when operational time should be limited to prevent overexposure. Provisions should be made in the design of the cell for the routine or emergency handling of radioactive material which presents an internal radiation hazard.

f. Post conspicuous signs on all contaminated material and store the material in a safe place.

g. Decontaminate all contaminated material which is not being used for training purposes.

h. Either erect a 7' high, chainlink fence, or equal, around the present radiation area within Pelham Field; post the fence with signs as required by paragraph 20.203(e) of AEC regulations; and lock the entrance, or lock the entrance to the present barbed wire enclosure; erect an additional fence around the sources at such a distance that the exposure rate at the fence line does not exceed 300m/hr; post the fence with signs as required by paragraph 20.203(c) of AEC regulations; and indicate the exposure rates on the signs.

i. Remove a randomly selected low curriage sealed source from the Pelham Field area every three months and examine the source for leakage. If the source container shows signs of leakage or deterioration remove all the sources from Pelham Field and reincapsulate them.

j. Any source removed from Pelham Field area should be reincapsulated in the Chemical Corps School designed brass capsule prior to further use.

k. Provide a suitable storage site for the radioactive material. Insofar as practicable individual source holders should be provided. The source holders should be conspicuously posted to show the quantity of identity of the respective sources and the remote handling and shielding equipment required to effect a transfer from the source holder. The area should be of sufficient size and layout to permit the safe handling of sources and the source holders. The area should be inaccessible to unauthorized persons.

l. Render the old burial ground inaccessible to children pending completion of decontamination.

m. Decontaminate the old burial ground.

n. Fence and post the new burial ground.

o. Discontinue the use of the new burial ground until specific approval of its use has been obtained from the AEC and Commanding General, Chemical Corps Materiel Command (see para 7, AR 755-380).

p. Make arrangements with either the Lexington Signal Depot or the National Bureau of Standards to submit Chemical Corps School film badges for an annual accuracy check.

6. CONCLUSION. When the recommendations of this report have been effected all reasonable precautions will have been taken to protect persons from needless exposure to ionizing radiation and the radiologic protection program at the Chemical Corps School will be in consonance with the recommendations of the National Committee on Radiation Protection and Measurements, the pertinent Army Regulations, and the AEC regulations.

1 Incl

Cal C Sch - S.O.P.  
"Work Involving  
Radiation Hazards"

✓s/ Charles E. Coner

✓t/ CHARLES E. CONER

Captain, MSC

Chief, Radiologic Hygiene Division

APPROVED:

✓s/ Edward J. Dehne

✓t/ EDWARD J. DEHNE

Lt Colonel, MC  
Commanding

UNITED STATES  
ATOMIC ENERGY COMMISSION

IN REPLY REFER TO:  
IEB:JWH

Oak Ridge, Tennessee  
November 20, 1956

U. S. Army Chemical Corps School  
Fort McClellan, Alabama

Attention: Col. C. H. Wood, Chairman  
Radioisotopes Committee

Subject: APPLICATION FOR "BROAD SPECIFIC LICENSE"

Gentlemen:

We regret that you were unable to be present during the review of your radioisotopes program on our recent visit to Fort McClellan.

We discussed with Col. Brice and others the AEC revised licensing program whereby the old "General Authorization" has been replaced by a "Broad Specific License" arrangement. Under this type of licensing system, we are able to provide for any byproduct material between Atomic Nos. 3 to 83, inclusive. However, this license will have a possession limit of from a few millicuries to several curies for each of the byproduct materials. This possession limit will depend upon the institution's specific needs and the facilities to safely handle the byproduct materials. If the possession limit for certain isotopes is considerably different from the majority of isotopes in the "3 to 83 group", it is suggested that you specify possession limits as required. For byproduct materials which you may require other than Atomic Nos. 3 to 83, inclusive, it will be necessary that you specify the isotope and the possession limit in order that these materials may be included in your "Broad Specific License." Tritium is licensed on a procurement basis rather than a possession limit; therefore, the entire amount that you may require should be itemized in Section 8 of Form AEC-313, "Application for Byproduct Material License."

As pointed out at the time of our visit, we have a copy of your "Standard Operating Procedures", dated April, 1953; it was understood, however, that the publication is being revised and we therefore should like to receive a copy of this revision with your application. We should also appreciate receiving a copy of your plans for the hot cell as discussed by Col. Brice and Lt. Powell. We are particularly interested in a description of the equipment, facilities and operating procedures for encapsulation of radio-cobalt if this program is to be continued.

We are enclosing a packet of material concerning our revised licensing procedures along with a sample application form. In completing your application for a "Broad Specific License", we shall be happy to have you contact us if questions arise concerning AEC requirements.

U. S. Army Chem. Corps School  
Col. C. H. Wood

- 2 -

November 20, 1956

You will find in this packet a copy of AEC "Standards for Radiation Protection" which was published in July, 1955. These standards are issued as a part of byproduct licenses and should be reviewed prior to submitting your application; a copy of these standards was left with Col. Brice and Lt. Powell at the time of our visit. We should particularly like to point out the "MPE" values in "Appendix A - Permissible Total Weekly Doses in Significant Volumes of Critical Organs Under Various Conditions of Exposure." A review of your film badge records at the time of our visit indicated that several of your personnel had greatly exceeded these maximum permissible exposure levels; therefore, corrective measures should be established to prevent re-occurrence of exposures of this nature.

We also noted during our visit that the type of radiation signs used by the Chemical Corps does not conform to the type of caution sign referred to in Section 20.24 of these regulations. We are, therefore, enclosing 4 signs routinely recommended by the AEC for warning of radiation hazards.

Lt. Powell discussed the possibility of coming to Oak Ridge in the near future and it was suggested that he discuss encapsulation techniques with personnel at ORNL. The laboratory has discontinued the use of soft solder for encapsulation purposes and is now using silver solder in sealing encapsulated sources of radioactive materials. Past experiences have indicated that soft solder does not stand up under many conditions which it may be subjected to. We, therefore, strongly recommend that you reconsider your encapsulation techniques.

Please be assured of our desire to serve your continuing isotope needs.

Very truly yours,

James W. Hitch, Assistant Chief  
Byproduct Licensing Branch  
Isotopes Extension  
Division of Civilian Application

Encls.:

1. Info Packet, w/sample application form
2. Caution Signs (4)

cc: G. H. Giboney, SROO, Augusta, Ga.  
Inspection Division

November 16, 1956

J. W. Hitch and J. H. Maddox

VISIT TO U. S. ARMY CHEMICAL CORPS SCHOOL, FORT McCLELLAN, ALABAMA

SYMBOL: IEB:JWH

Persons Visited: Lt. Col. Charles Brice, Jr., Chief of Technical Division and Lt. William G. Powell, Radiological Safety Officer.

Other Persons Visited Included: Major Daniel E. Kalish, 2nd Lt. James M. Williams and 2nd Lt. Robert F. Smith who is assistant radiological safety officer. Col. C. E. Wood is chairman of the radioisotopes Committee; however, he was unable to be present on the date of our visit.

Other Members of the Isotopes Committee are as follows:

Col. Joseph M. Cameron  
Major John B. Beach

License: This institution has not had a license. They have been operating under a General Authorization with an unlimited procurement limit. The authorization expires on December 31, 1956.

Field Representatives: J. W. Hitch, John H. Maddox.

Accompanied by: G. E. Gibensy, Savannah River Operations Office.

Date of Visit: Pre-Licensing visit on November 9, 1956.

#### I. Administrative Control

The administrative control of the program at this institution appears to be satisfactory with the exception of rather high exposures to several personnel during the encapsulation of some radiocobalt. Standard operating procedures, as published in April, 1953, are presently being revised. From an administrative standpoint, the SOP, as outlined, appears to be reasonably satisfactory. However, the radiation symbol used at this institution does not comply with that as noted in Part 20 of our proposed Code of Federal Regulations.

The program at this installation is that of training soldiers in fall-out surveys, and it is necessary that these people receive some exposures to radiation. However, for the most part, it is unnecessary that they receive levels close to the 300 mr/wk MPE value. The high exposures to Lt. Powell and Sgt. Courtwright indicated that Lt. Powell had insufficient understanding of the radiation hazards. He indicated that some of their people wished to come to Oak Ridge for further training in radiation safety. He indicated that he had contact with Dr. Anderson, ORNL, regarding training of other individuals and also the possibility of obtaining personnel already trained. Lt. Powell has had the health physics course at ORNL, but it was doubtful that he was putting into practice the precepts which such a course normally establishes.

## II. Procurement Control

Procurement of radioisotopes at this institution appeared to be well coordinated, although they had obtained some rather large amounts of radiocobalt under their present authorization. They indicated that they might obtain more, although they had approximately 400 curies in storage at the time of our visit.

## III. Material on Hand

During the past year, this institution received 1 unit of Mercury 203, 718 curies of Cobalt and 2710 curies of Cobalt in another shipment. At the time of our visit, 3750 curies of Cobalt was in storage on the Rad Survey Area No. 3. These sources were stored underground in devices which can be operated by a long string to bring the source above the surface. The size of these sources vary in magnitude from less than 100 millicuries to several hundred millicurie units. The area is well fenced, although we did not have a chance to visit it - it being several miles from the main school and accessible only by jeep or by foot. Other Cobalt stored was 450 curies, mostly stored underground in a water bath.

## IV. Disposal of Radioisotopes

It was learned that Ft. McClellan has set aside a field for the disposal of radioactive waste. Most of this waste is contaminated equipment, although we did not see this disposal area. It was reported to have been enclosed and secured against unauthorized entry. It was reported also that the field was posted to assist in controlling entry to the area. The area was selected because of its topographical qualifications and the low possibility of radioactive materials migrating into drinking water supplies. All waste is buried at a depth not less than 10 feet below the surface.

It was pointed out to Lt. Powell that burial ground should first be approved by the AEC prior to use. However, it appeared, from his description, they had observed the precautionary measures which we would normally require.

#### V. Facilities and Equipment

There were several rooms set aside for calibration of instruments; this being a part of the course of instruction. Trainees may work in a field approximately 40 mr/hr over short periods. Normal exposures to personnel over the entire course is not proven to be greater than 3 or 400 mr. The facility used for encapsulation had been disassembled. We were assured that new facilities were to be constructed prior to further encapsulation. A pair of slave manipulators from Central Scientific Company has already been delivered for use in this proposed hot cell. A small room, approximately 10 foot square, was constructed in a fenced off area in the rear of the training building. This room had walls of approximately 10 inches of concrete and had stored within a variety of small sources of radiocobalt which could be used in the radiation survey area. In addition, there were 3 large storage containers, approximately 18 inches in diameter which could be used for storage. These containers were steel jacketed and lead filled and had been obtained from Dugway Proving Ground. In addition, a water well at one corner of this building was used for storage of approximately 400 curies of Cobalt. Storage of Cobalt and facilities for future storage appeared to be entirely adequate.

#### VI. Ventilation

One of the laboratories was equipped with a very nice fume hood; however, it appeared to have had very little use up to the present time. All laboratory floors were covered with mastic tile and kept well polished. Work areas and surfaces were in first-class condition.

#### VII. Shielding

The only shielding which we were able to review was that used for storage and was entirely adequate for this purpose. The hot cell already used has been disassembled with a new one to be constructed.

#### VIII. Equipment

The equipment, as used in the past, for source encapsulation, was not reviewed because of its disassembly. Neither was complete equipment set up for future encapsulation. The remote slave manipulators should be a great boon in design of the hot cell for keeping exposures to personnel low.

## II. Instrumentation

A great variety of instruments were available for radiation survey purposes, including the AN/PDR-27A and C. These instruments have a range of 500 mr/mr. They also have small calibration sources of approximately 5 microcuries of Cobalt. Also, available was a scintillation type AN/PDR-18A and B. These instruments also had a calibration source of 100 microcuries of Strontium 90. For personnel monitoring, both dosimeters low and high range and film badges are used. Film badge processing is carried out under the supervision of Lt. Powell. An Anaco-MacBeth densitometer is used for density measurements and approximately 25 films are used as standards in establishing density versus radiation curves. A brief review of their film badge interpretation program indicated that they were taking the necessary steps to obtain appropriate readings. It was also learned that their film badge and high range dosimeter readings were in reasonably close agreement.

## X. Precautionary Procedures

All personnel are monitored with film badges and a low range and high range dosimeter. Blood counts are also kept on various personnel. Although monitoring devices are used routinely, several high exposures have occurred at this installation. It would appear that these exposures were due to two causes: Lack of proper precautionary measures in handling techniques and poor facilities for encapsulation. For instance, Lt. Powell had received cumulative doses of approximately 12 r since his arrival there in early 1955. High to weekly doses to Lt. Powell were as much as 2870 and 1620. These doses occurred on consecutive monitoring periods. Other high level doses were 642 and 598 mr per 2-weeks' period. A Sgt. Courtwright had received in a period of a year's time, better than 7 r. It was pointed out to both Col. Brice and Lt. Powell that these exposures levels were much higher than the AEC will permit under routine licensing, and that we would like very much to encourage them to take appropriate steps to correct subsequent exposures of this magnitude and that certainly exposures greater than 300 mr/wk should be of a non-routine nature and that individuals who have already obtained such high exposures be delegated to duties requiring little, if any, subsequent exposure until the over-all level of radiation could be brought to permissible averages. The 5 r per year, as recommended by the National Research Council, was discussed at some length and they were told that it may possibly be included in radiation protection standards that the AEC would adopt.

#### XI. Controlled Areas

All radiation at this institution is handled in controlled areas and for routine operations. Exposures to personnel are not excessive.

#### XII. Records

Personnel monitoring records were kept with cards set up for each individual, showing not only their periodic exposures, but their cumulative exposures during the entire time the trainee was on that post. This was true for trainees, as well as instructors and other personnel involved in the program. Records of receipt of material were also adequate.

#### XIII. Compliance with Regulations

Procurement of radioisotopes was in accord with limitations as provided for in their authorization. Material was located and used in such a way that individuals should not be overly exposed. However, there was certain nonroutine operations which we felt to offer unnecessarily high exposures to a few isolated personnel which has been discussed in more detail above.

#### XIV. Compliance with Conditions of License

As noted above, this institution does not yet have a license, and therefore, their program has not been tied to Part 20. They do have written procedures and the only exceptions are overexposures to personnel and the improper posting of radiation areas - using a symbol all their own. (See front page of SOP)

#### XV. Hazardous Conditions

The encapsulation of Cobalt at this institution in the past has offered considerable hazard to individuals. The facility has been dismantled and new facilities are to be constructed. It is hoped that with the new facilities for the encapsulation of radioisotopes, exposure to personnel will be greatly minimized. Col. Brice assured us that they would abide by AEC recommendations in the future.

#### XVI. Summary

The program at this institution is that of radiological warfare training of personnel. They expect to have in their possession approximately 600 Curies of Cobalt and various other isotopes

November 16, 1956

but of much lesser magnitude. They have carried out encapsulation of Cobalt for radiological warfare studies and have had rather high exposures in several instances. Old facility for encapsulation has been disassembled and a new one proposed. It was recommended that they construct facilities which would minimize personnel exposures and that their sealing techniques be comparable to that used at ORNL. Lt. Powell stated that he planned to come to Oak Ridge both to review their new application for a license and sealing techniques at ORNL.

bcc: G. H. Giboney, SROO, Augusta, Ga.  
Inspection Division  
REB Folder  
Helen P.

EVALUATION AND RECOMMENDATIONS

5/4/56

Institution: **U. S. Army Chemical Corps School**  
**Fort McClellan, Alabama**  
 Address: \_\_\_\_\_

Category: \_\_\_\_\_  
 RSB Representative: **JWH - JHM**  
 Date of Visit: **11-9-56**

Type of License	Pre-licensing	Reviewed by:
Limited _____	First _____	RSB _____
Broad _____	Repeat <b>X</b> _____	Licensing _____
Comprehensive _____	Post-licensing _____	
General <b>X</b> _____	First _____	
	Repeat _____	
	Special _____	

Conditions: Satisfactory; Marginal; Unsatisfactory; Not Applicable (S, M, U, NA)

- |                                    |                                      |
|------------------------------------|--------------------------------------|
| I. <b>M</b> Administrative Control | IV. <b>S</b> Personnel Monitoring    |
| II. <b>S</b> Material Licensed     | <b>M</b> Radiation Survey Procedures |
| <del>NA</del> Disposal             | <b>S</b> Controlled Areas            |
| III. <b>V</b> Lab Facilities       | <del>NA</del> Non-controlled areas   |
| <b>V</b> Shielding                 | <b>N</b> Radiation Signs             |
| <b>M</b> Equipment                 | V. <b>S</b> Records                  |
| <b>S</b> Instrumentation           | VI. <b>S</b> Regulations             |
|                                    | VII. <b>S</b> Terms and Conditions   |

Critical Evaluations: (Summary of over-all program, discussion of specific marginal and unsatisfactory conditions with recommendations for corrective action.)

- Disposal by burial on site was unauthorized. Received excessive exposure during encapsulation of Cobalt - inadequate equipment and shielding.

Revisit is Recommended: (When)

11-20-56 Letter of Recommendation Sent to: **Attn: Col. C. H. Wood, Chairman**  
 (Date) **Radioisotopes Committee**

Letter of Compliance Received From:  
 (Date)

DALQ-MAI

12 September 1972

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

Gentlemen:

Please refer to USAEC Byproduct Material License No. 01-02861-01 issued to the U.S. Army Chemical Center and School, Fort McClellan, Alabama.

We request that items 6D, 7D, 8D, 9D, 13, 15 and 16 be deleted from this license. These items refer to 15,180 curies of Cobalt 60 contained in 1,020 sealed sources of approximately 15 curies each.

On 17 March 1972 200 of these sources were transferred to Nuclear Engineering Corporation for land burial. On 11 July 1972 the remaining 820 sources were also transferred to Nuclear Engineering Corporation for land burial.

Also, we request that the school be authorized to possess and use an additional 2.75 curie source of Americium 241 as outlined in the attached application.

Sincerely yours,

Signed

1 Incl  
As stated (2 cys)

ALLEN W. REHRIG  
Acting Chief  
Industrial Division

30445



DEPARTMENT OF THE ARMY  
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS  
WASHINGTON, D.C. 20310

DALO-MAS-I

20 June 1973

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

Gentlemen:

The US Army Chemical Center and School at Fort McClellan, Alabama has been disestablished as a training facility. The radioactive material possessed by the school under USAEC Byproduct Material Licenses 01-02861-01 and -02; and Special Nuclear Material License SNM-344 have, for the most part, been transferred to the US Army Aberdeen Proving Ground.

There is some residual contamination. The attached application is forwarded for your approval to cover that material.

Sincerely yours,

*Peter M. Baldino*  
PETER M. BALDINO  
Chief, Support Division

1 Incl  
As stated

RECEIVED  
COMPLIANCE

UNITED STATES ATOMIC ENERGY COMMISSION  
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

ORIGINAL FOR

INSTRUCTIONS. - Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

29610 new dash 02861

<p>1. (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital, person, etc. Include ZIP Code.)</p> <p>COMMANDER, US Army School/Training Center Fort McClellan, Alabama 36201</p> <p>ATTN: AJMGP-S-S</p>	<p>(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1 (a). Include ZIP Code.)</p> <p>Material is residual contamination in three places at Fort McClellan, all within fenced area behind Building 3182.</p>
<p>2. DEPARTMENT TO USE BYPRODUCT MATERIAL</p> <p>Material will not be used. The Fort McClellan Radiological Protection Officer will be the action officer.</p>	<p>3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.) Material formerly under BML-1-2861-1, which will be cancelled 24 Jun 73. THIS IS NOT A RENEWAL OR AMENDMENT APPLICATION.</p>
<p>4. INDIVIDUAL USER(S) (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)</p> <p>NO USERS</p>	<p>5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)</p> <p>Mr. Charlie U. Daniel, Jr.</p>

<p>6. (a) BYPRODUCT MATERIAL (Elements and mass number of each)</p> <p>Primarily Cobalt-60 (Presence verified by United States Army Environmental Hygiene Agency (USAEHA)). Some Cesium-137 (presence suspected)</p>	<p>(b) CHEMICAL AND OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)</p> <p>Chemical form is not known. Physical form is small solid particles absorbed and adsorbed onto permanent metal and concrete surfaces in three places, all within the fenced area behind Building 3182. Contained within this area is Building 3192, formerly known and referred to as the Hot Cell Facility. Maximum dose rate is 65 mr/hr. Precise curiage unknown; estimated amount is 10 millicuries. See map attached to proposed Post Regulation, "Residual Radiological Contamination Safety Program", for locations of contamination. Recent wipe tests show that, even after decontamination efforts, considerable removable contamination exists within the Hot Cell portion of building 3192 (up to 550,000 dpm). This portion of the building has been walled off for safety reasons. Decontamination of USACMLCS at Fort McClellan has been carried out in accordance with U S Army Environmental Hygiene Agency Report 43-041-73 and AEC Region II Director of Regulatory Operations guidance, both of which sources recommended leaving these three places contaminated due to time, money, and hazard difficulty in decon.</p>
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7 DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and or device in which the source will be stored and/or used.)

Material is residual contamination and cannot be used in the normal sense of the word. No use of any type is planned.

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**TRAINING AND EXPERIENCE** EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

B TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)		FORMAL COURSE (Circle answer)	
			Yes	No	(Yes)	No
a Principles and practices of radiation protection	Radiological Safety Course USACMLCS, Ft McClellan, AL	88 hrs	Yes	No	(Yes)	No
b Radioactivity measurement standardization and monitoring techniques and instruments	same as above		Yes	No	(Yes)	No
c Mathematics and calculations basic to the use and measurement of radioactivity	same as above		Yes	No	(Yes)	No
d Biological effects of radiation	same as above		Yes	No	(Yes)	No

**9 EXPERIENCE WITH RADIATION** (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
SR-Y-90	25mCi (TS-784/PD)	USAIC, Fort Benning, GA	Jan 60-Mar 64	Calibration (RPO)
15,000 Ci assorted		isotopes USAS/TC, Fort McClellan, AL	Apr 64 - to date	Inspection (RPO and Alt RPO during this period)

**10 RADIATION DETECTION INSTRUMENTS** (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr./hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)
AN/PDR-27	1	beta-gamma	.01 mr/hr to 1/2 r/hr	3-4mg/cm <sup>2</sup>	monitoring

**11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.**

Routine Army calibration (every 6 months at Directorate of Industrial Operations at Fort McClellan, AL)

**12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED.** (For film badges, specify method of calibrating and processing, or name of supplier.)

Film badges are available from Noble Army Hospital, Fort McClellan, but use of them is planned only for monitors or others who must work in close proximity to the hazard.

**INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE**

**13. FACILITIES AND EQUIPMENT.** Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanation sketch of facility is attached. (Circle answer) Yes No Multi-Curie handling capability exists in Hot Cell but controls have been disconnected and cell has been walled off.

**14. RADIATION PROTECTION PROGRAM.** Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source. A safety program has been devised - see attached paper.

**15. WASTE DISPOSAL.** If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

No wastes will be generated as a result of this license.

**CERTIFICATE (This item must be completed by applicant)**

**16 THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.**

Date

EMMAY 7 7

APPLICANT NAMED IN ITEM 1  
JOSIAH W. WALLACE, JR.

20 11

Colonel, FA

Commanding

Title of certifying official

**WARNING.**— 18 U. S. C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

DEPARTMENT OF THE ARMY  
Headquarters, US Army School/Training Center  
Fort McClellan, Alabama 36201

FORT MCCLELLAN  
REGULATION 385- 8

(dated)

SAFETY

RESIDUAL RADIOLOGICAL CONTAMINATION SAFETY PROGRAM

1. Purpose: To prescribe the policies and procedures necessary to minimize the exposure of personnel to nuclear radiation contained in residual contamination and to insure periodic assessment of the residues.
2. Scope: This regulations is applicable to all personnel assigned or attached to Fort McClellan and have occasion to enter the area to the rear of building 3182.
3. Objective: To prescribe standards and procedures necessary to insure that both recurring and non-recurring access to the area at the rear of building 3182 is limited, that awareness of the hazardous conditions are insured, that required maintenance is performed, that periodic assessment by both on and off post agencies is accomplished, and that proper advice is available in the event of an emergency involving the controlled area. (See attached map at inclosure 1).
4. Organization and Responsibilities: The Fort McClellan Radiological Protection Officer, appointed in accordance with AR 40-14, will be responsible in the name of the Installation Commander, for insuring that all provisions of this regulation are implemented. No personnel, other than those who work under the supervision of the Radiological Protection Officer, are specifically tasked in connection with this regulation, except that all personnel at Fort

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McClellan will abide by the decisions of the Radiological Protection Officer regarding matters involving the radioactive contamination, and will provide necessary support to the Radiological Protection Officer within their capabilities.

5. Radiation Safety Procedures:

a. The area located immediately behind building 3182 will continue to be fenced and will be a limited access area, with access controlled by the Fort McClellan Radiological Protection Officer. All personnel desiring entrance to this area will insure that the Radiological Protection Officer is informed of the details of their activities within the area and grants them permission to enter. This includes both recurring access, such as for maintenance of the area and building or classes conducted in building 3192, and non-recurring access, such as one-time tours. The Radiological Protection Officer will regularly schedule maintenance access to assure proper maintenance services.

b. The eight existing radiation warning signs will be maintained as erected and instructions will be fully complied with at all times. (See inclosure 2).

c. The control valves and switches for the liquid waste disposal apparatus will be operated only by personnel authorized by the Radiological Protection Officer. The access panels will be kept secured at all times.

d. The installation RPO will conduct a radiation survey semi-annually with specific attention devoted to the containment of the hazard and observation of its decay. This survey will include beta-gamma survey

meter monitoring plus wipe tests. The RPO will perform wipe tests on each of the three areas of contamination; five on the hot cell environs, and one each on the liquid waste disposal apparatus and on the well by building 3180, with three others to be taken at points of the RPO's discretion, for a total of ten wipe tests. These tests will be performed as directed in NBS Handbook 92, Chapter 5, and will be sent to the US Army Environmental Hygiene Agency, Edgewood for analysis. Packaging and transportation of wipe tests will be accomplished IAW AR 55-55, paragraph 3-13. Records will be maintained for all survey and wipe test results.

e. A regular scheduled visit by personnel of the US Army Environmental Hygiene Agency will be requested annually by the installation RPO.

f. In the event of an emergency situation involving possible release or dispersion of the radioactive material, immediate contact will be made with the US Army Environmental Hygiene Agency authorities by the Radiological Protection Officer requesting advice, and assistance if necessary.

g. Recurring monitoring visits by the US Army Environmental Hygiene Agency may be made at more widely spaced intervals than annually if so directed by EHA Health Physics supervisory personnel based on survey results.

h. Film badges will be drawn from and returned for processing to Noble Army Hospital for use by monitors or others who must work in close proximity to the residual contamination. Post Engineer building maintenance will not fall in this category, except in special cases. The Radiological Protection Officer will make the decision as to who is to be film badged.

#### 6. References:

a. AR 40-14, Control and Recording Procedures for Occupational Exposure to Ionizing Radiation, 29 Sep 66.

b. National Bureau of Standards Handbook 92, Safe Handling of Radioactive Materials, 9 Mar 64.

c. AR 55-55, Transportation of Radioactive and Fissile Materials Other Than Weapons, Nov 70.

FOR THE COMMANDER:

2 Incls  
as

LARRY D. LILLARD  
Major, AGC  
Adjutant General

OFFICIAL:

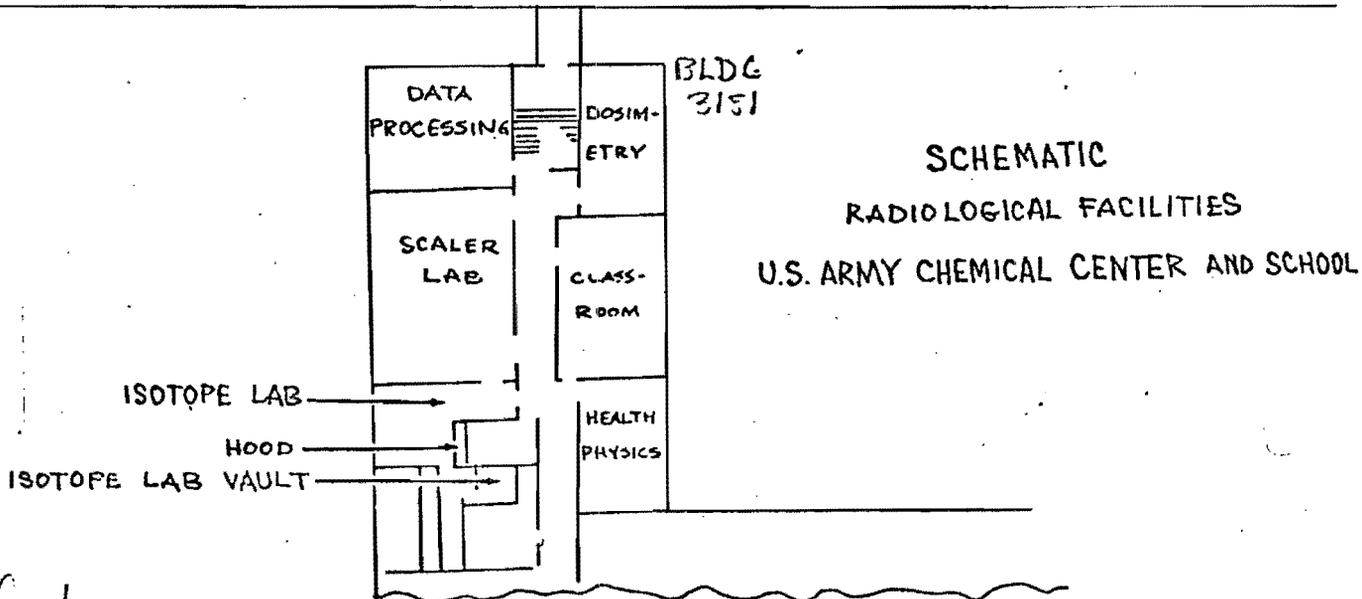
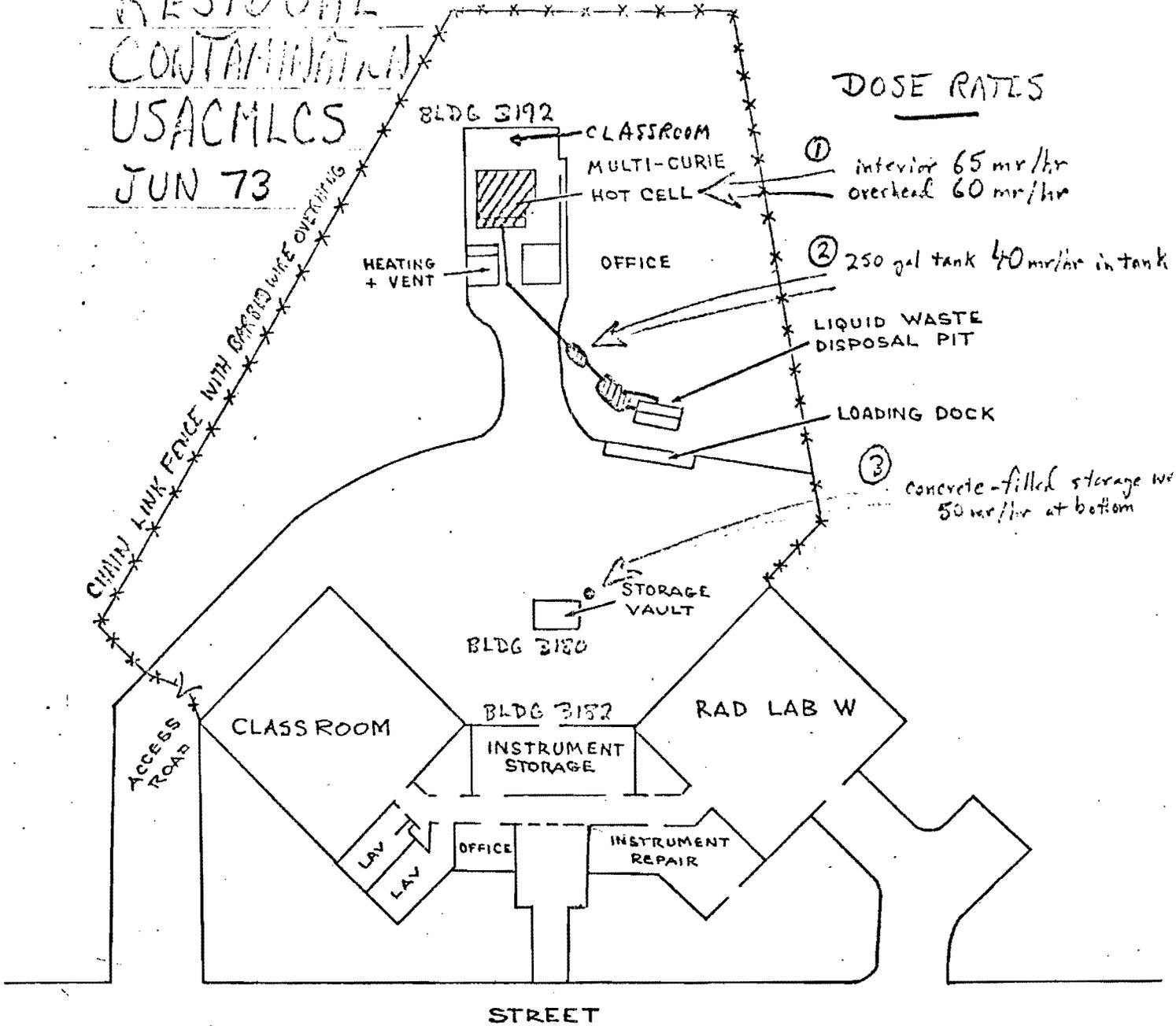
G. B. ATWELL  
CPT, AGC  
Asst Adjutant General

DISTRIBUTION:

A

RESIDUAL  
CONTAMINATION  
USACMLCS  
JUN 73

DOSE RATES

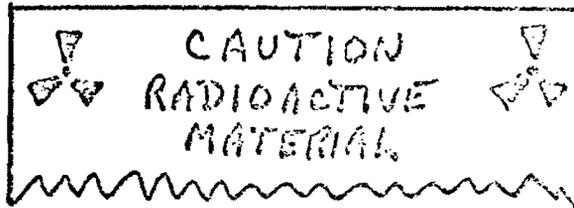


encl 1

# SIGNS:

All signs IAW Ft McClellan Reg 4-20-5, and AR 385-30 para 3-10, 3-4, 3-5, FIG 3-1.

All 8 signs will be lettered at the TOP as follows:



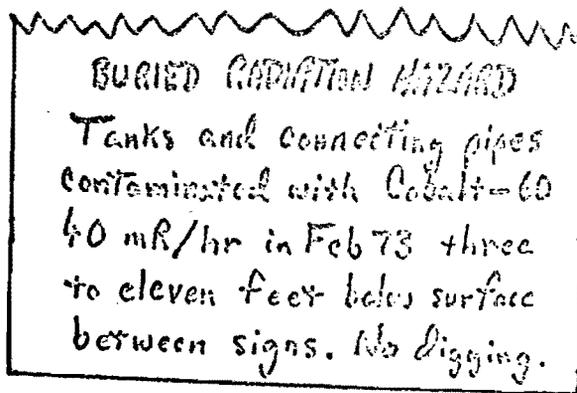
← radiation trefoil  
magenta on yellow background  
← letters in black on yellow background

Below this, on EACH sign, will be lettered explanatory material, shown below:

SIGN #1

SIGN #2

} EXTERIOR SIGNS. LETTER ON BOTH SIDES.



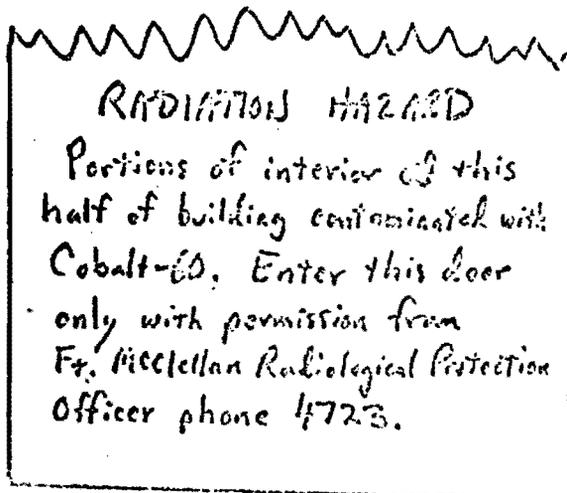
LOCATIONS:

- One by 3192 driveway near building (on post)
- One by Waste Valve pit on 3192 side (on post)

(Two posts required)

SIGN #3

EXTERIOR SIGN. ONE SIDED.



LOCATION:

- Affix to North door, 3192 (Metal door)

SIGN #4 INTERIOR SIGN. ONE SIDED.

WARNING  
Do not remove or penetrate  
this barrier, as this would  
allow access to the hot cell  
portion of building, which  
contains radioactive contamination.

LOCATION:

Affix to "false-wall"  
barrier to be placed  
in 3192. (Wood barrier)

SIGN #5 INTERIOR SIGN. ONE SIDED.

RADIATION HAZARD  
Interior of hot cell is  
contaminated with Cobalt-60  
65 mR/hr maximum in Feb 73.  
Do not attempt to enter.

LOCATION:

Affix to hot cell  
17-ton door, Bldg 3192.  
(concrete & steel door)

SIGN #6 INTERIOR SIGN. ONE SIDED.

RADIATION HAZARD  
Hot cell behind this barrier  
and some overhead ducts are  
contaminated with Cobalt-60  
65 mR/hr maximum in Feb 73.  
Do not cross this barrier or  
work overhead without a  
radiation meter and approval  
from Fr McClellan Radiological  
Protection Officer phone 4723.

LOCATION:

Affix to barrier to be  
placed in hot cell end of  
building 3192.  
(Wood barrier)

SIGN #7 INTERIOR SIGN. ONE SIDED.

WARNING  
This door is locked from  
the other side to prevent  
access to radioactively  
contaminated areas within  
the building. Do not  
attempt to enter.

LOCATION:

Affix to door between  
classroom and hot cell, on classroom  
side. (3192)  
(Metal louvered door)

SIGN #8 EXTERIOR SIGN. ONE SIDED.

IN CASE OF EMERGENCY  
During Duty Hours Call:  
Fremont Safety Office  
phone 4723  
After Duty Hours Call:  
Staff Duty Officer  
phone 3821  
  
THIS IS BUILDING 3192.

LOCATION:

Affix to West door, 3192.  
(Metal door)

**BYPRODUCT MATERIAL LICENSE Amendment No. 20**

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 32, 33, 34, and 35, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with letter dated September 12, 1972,	
1. Department of the Army U. S. Army Chemical Center and School		3. License number 01-02861-01 is amended	
2. Radiological Division Technical Department Fort McClellan, Alabama 36205		in its entirety to read as follows:	
		4. Expiration date August 31, 1977	
		5. Reference No.	
6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioac- tivity which licensee may possess at any one time	
A. Any byproduct material with Atomic Nos. 3 through 83, inclusive	A. Any	A. 100 millicuries of each	
B. Cesium 137	B. Sealed source (ORNL)	B. 1 source of 135 curies	
C. Cesium 137	C. Sealed sources (3M Model 4F6S)	C. 2,000 millicuries total No single source to exceed 500 millicuries	
D. Americium 241	D. Sealed neutron source (Monsanto MRC-N-SS-W-AmBe)	D. 2.75 curies	

**9. Authorized use**

A. through D. Instruction and Research and Development as defined in 10 CFR 30.

**CONDITIONS**

10. Byproduct material shall be used only at the licensee's address stated in Item 2 above.

Supplementary Sheet

License Number 01-02861-01

**CONDITIONS**

Amendment No. 20

**13. continued**

C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the Directorate of Licensing, U. S. Atomic Energy Commission, Washington, D. C. 20545, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall also be sent to Region II, Directorate of Regulatory Operations, USAEC, Suite 818, 230 Peachtree Street, N.W., Atlanta, Georgia 30303.

D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

14. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated March 17, 1967; U. S. Army Chemical Center and School Memorandum Number 385-2, dated November 2, 1970; and letters dated August 15, 1972, and September 12, 1972.

Date SEP 26 1972

*REB*  
*PER/30*

For the U. S. Atomic Energy Commission

Original Signed by

**Robert E. Brinkman**  
**Materials Branch**

by \_\_\_\_\_

Division of Materials Licensing  
Washington, D. C. 20545

*E*

**U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE**

No. 1-2261-1 AMENDMENT NO. 9  
(1965)

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with application dated April 1, 1963	
1. Name	Department of the Army U.S. Army Chemical Corps School	3. License number	1-2261-1 is amended in its entirety to read as follows:
2. Address	Radiological Branch Technical Division Fort McClellan, Alabama	4. Expiration date	November 30, 1965
		5. Reference No.	
6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time	
A. Any byproduct material with Atomic Nos. 3-83, inclusive  (See page 2)	A. Any	A. 100 millicuries of each	
9. Authorized use			
A. and C. RESEARCH AND DEVELOPMENT as defined in Section 30.4(k), Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Licensing of Byproduct Material." Laboratory and field instruction in radiological defense.			
B. Calibration of instruments. (See page 2)			

**CONDITIONS**

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.
11. The licensee shall comply with the provisions of Title 10, Part 30, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation."
12. Byproduct material shall be used by, or under the supervision of, individuals designated by the U.S. Army Chemical Corps School Isotope Committee.
13. In lieu of the control device requirements of Section 30.203(a)(2), the full-time radiological field shall be enclosed by a fence six-foot high (four feet of hog wire topped by at least three strands of barbed wire). All gates into the full-time radiological field shall be padlocked at all times except for entry by authorized personnel.

(See page 2)

**UNCLASSIFIED  
COMPLIANCE**

MATERIAL LICENSE  
Supplementary Sheet

Continued From Page 1

License Number 1-2861-1  
(K65)

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
B. Cesium 137	B. Oak Ridge National Laboratory Sealed Source	B. One source of 135 curies
C. Cobalt 60	C. Oak Ridge National Laboratory Sealed Sources	C. 750 curies contained in 50 sources of 15 curies each
D. Cobalt 60	D. Sealed Sources	D. 2350 curies
E. Cobalt 60	E. Metal	E. 5230 curies
F. Cobalt 60	F. Gamma Industries Encapsulated Sealed Sources	F. 12420 curies contained in sources of not more than 15 curies /10 percent each

9. Authorized use continued

- D. For use in Pelham Range radiological field for training in radiological defense.
- E. Fabrication of sealed sources for placement in Pelham Range radiological field for training in radiological defense.
- F. For use in Pelham Range radiological field for training in radiological defense.

Conditions continued

- 14. A. Each sealed source acquired from another person and containing byproduct material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.
- B. Each sealed source fabricated by the licensee shall be tested for contamination and/or leakage immediately after fabrication. If the test reveals the presence of 0.005 microcuries or more of removable contamination, the licensee shall repair and/or decontaminate and retest the source. Sealed sources fabricated for distribution and containing byproduct material (with the exception of byproduct material in the form of gas, byproduct material with a half-life not exceeding thirty days, and Iridium 192) shall, in addition to an initial test upon fabrication, be stored for a period of seven days and retested prior to transfer to another person or as otherwise specifically provided for in this license.
- C. Each sealed source containing byproduct material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas, shall be tested for leakage and/or contamination at intervals not to exceed six months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed three months. (See page 2)

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE  
Supplementary SheetLicense Number 1-2861-1  
(K65)

AMENDMENT NO. 9

## Condition 14 continued

- 14.D. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- E. If the test required by Subsection A or C of this condition reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five days of the test with the Director, Division of Licensing and Regulation, U.S. Atomic Energy Commission, Washington 25, D. C., describing the equipment involved, the test results and corrective action taken. A copy of such report shall also be sent to the Director, Region II, Division of Compliance, USARC, 50 Seventh Street, Northeast, Atlanta 23, Georgia.
15. In lieu of the requirements of Condition 14.A., sealed sources in the Pelham Range radiological field shall be each tested according to the following schedule:
- A. Ten percent of the sources shall be tested for leakage and contamination at six-month intervals.
  - B. If any leaking sources are found in the ten percent tested, the leaking sources shall be withdrawn from use and repaired or disposed of and another ten percent of the sources shall be tested.
  - C. If any leaking sources are found in the second ten percent tested, the leaking sources shall be withdrawn from use and repaired or disposed of and all sources in the Pelham Range radiological field shall be tested.
  - D. If any leaking sources are found in the remaining sources tested, they shall be withdrawn from use and repaired or disposed of.
16. In lieu of the requirements of Section 20.203(f)(4), 10 CFR 20, sealed sources in the Pelham Range radiological field may be labeled as follows:

Radiation Symbol (in appropriate color)  
DANGER RADIOACTIVE MATERIAL DO NOT HANDLE  
(Serial Number)  
Notify Military Authorities If Found  
U.S. Army Chemical Corps School  
Fort McClellan, Alabama

The licensee shall maintain a permanent record of the quantity of activity in each source and the date of measurement. (See page 4)

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number **1-2861-1**  
**(K65)**

**AMENDMENT NO. 9**

- 17. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7 and 8 of this license in accordance with statements, representations and procedures contained in application dated April 1, 1963, and amendments thereto dated May 15, 1963; July 31, 1963; October 22, 1963; and October 28, 1963.

FOR DIV. OF *cc*

Date NOV 5 1963

*1. cmv 477B 11-5-63*

For the U. S. Atomic Energy Commission

Original Signed by  
Nathan Bassin

by **Leopoldo Branch**

Division of Licensing and  
Washington 25, D. C.

DML:RLL  
70-372

APR 6 1970

Department of the Army  
Office of the Deputy Chief of  
Staff for Logistics  
Washington, D. C. 20310

Attention: Mr. Charles P. Haas, Chief  
Industrial Support Branch  
PEMA Execution Division

Gentlemen:

Your reference: LOG/PE-15B-2219-A

Enclosed is Special Nuclear Material License No. SNM-344 as renewed.

Sincerely,

Original signed by  
Robert L. Layfield

Robert L. Layfield  
Source and Special Nuclear  
Materials Branch  
Division of Materials Licensing

Enclosure:  
As stated

DISTRIBUTION: (w/encls.)  
PDR  
Docket file  
Branch R/F  
Division R/F  
Layfield;s R/F  
CO, Region I  
H. J. McAldaff, OR  
R. Weber, SSM  
M. A. Dean, DML  
A. Cabell, DR:ADM

OFFICE ▶	DML				
SURNAME ▶	RLLayfield/dmb				
DATE ▶	4/6/70				

COPY

Form AEC-401  
9/68

UNITED STATES  
ATOMIC ENERGY COMMISSION

**SPECIAL NUCLEAR MATERIAL LICENSE**

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, "Special Nuclear Material", a license is hereby issued authorizing the licensee to receive and possess the special nuclear material designated below; to use such special nuclear material for the purpose(s) and at the place(s) designated below; and to transfer such material to persons authorized to receive it in accordance with the regulations in said Part. This license shall be deemed to contain the conditions specified in Section 70.32(a) of said regulations, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		3. License No. SNM-344
1. Name	Department of the Army	4. Expiration Date March 31, 1975
2. Address	U. S. Army Chemical Center and School Fort McClellan, Alabama 36201	5. Docket No. 70-372

6. Special Nuclear Material  Uranium 233 and plutonium	7. Maximum quantity of special nuclear material which licensee may possess at any one time under this license  25 milligrams of U-233 and 315 micrograms of plutonium as plated alpha sources.
--	--

8. Authorized use

For use in accordance with the statements, representations, and conditions specified in the licensee's application dated August 4, 1960, and supplements dated May 11, 1961; March 26 and November 4, 1964; February 13, 1967; June 17, 1969; and March 18, 1970.

CONDITIONS

9. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

For the U.S. ATOMIC ENERGY COMMISSION

Date of issuance APR 6 1970

Original signed by  
Robert L. Layfield *RL* 4/6/70

Robert L. Layfield  
Division of Materials Licensing

COPY

**MATERIALS DATA INPUT**



DOCKET NUMBER <b>070-00372</b>	MAIL CONTROL NO. <b>03113</b>	DATE REQUEST REC'D <b>06-26-73</b>	PROGRAM CODE (PRIMARY)
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SECONDARY PROGRAM CODES:

#1	#2	#3	#4	#5
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INDIVIDUAL LICENSEE	NAME	NAME
	NAME	NAME
	NAME	NAME

ORGANIZATION LICENSEE	ORGANIZATION NAME <b>Dept. Of The Army</b>	TYPE OF ORGANIZATION		
	DEPARTMENT OR BUREAU <b>U.S. Army Chemical Center and School</b>	U. S. GOVERNMENT AGENCY	EDUCATIONAL INSTITUTION	
		MEDICAL INSTITUTION	INDUST	OTHER

ADDRESS	BUILDING, STREET <b>Fort McClellan</b>	STATE <b>AL</b>	ZIP CODE <b>36201</b>
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APPLICANT'S COMMUNICATION DATED: <b>06-20-73</b>	CLASSIFICATION <b>U</b>	ASSIGNED TO:	RESULTING AMD. NO.
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ENCLOSURES:

UNCLASSIFIED DESCRIPTION:

**Ltr. reg for termination of license SNM-344**

**DO NOT REMOVE**

DISTRIBUTION:

**1-PDR**  
**1-RO**

**ACKNOWLEDGED**

OTHER REFERRALS			
NAME	DATE	NAME	DATE
<b>Malero</b> <b>w/ reg file cy and</b> <b>folder</b> <b>EEB</b>	<b>06-29-73</b>		



DOCKET NO. 70-372

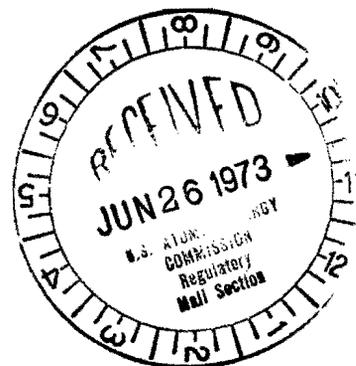
DEPARTMENT OF THE ARMY  
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS  
WASHINGTON, D.C. 20310

REGULATORY DOCKET FILE COPY

DALO-MAS-I

20 June 1973

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



Gentlemen:

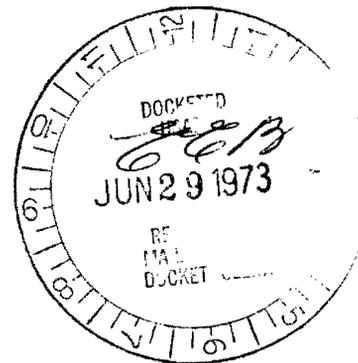
The US Army Chemical Center and School at Fort McClellan, Alabama has been disestablished as a training facility. The radioactive material possessed by the school under USAEC Byproduct Material Licenses 01-02861-01 and -02; and Special Nuclear Material License SNM-344 have, for the most part, been transferred to the US Army Aberdeen Proving Ground.

There is some residual contamination. The attached application is forwarded for your approval to cover that material.

Sincerely yours,

*Peter M. Baldino*  
PETER M. BALDINO  
Chief, Support Division

1 Incl  
As stated



COMPLIANCE

5411

COPY

SPECIAL NUCLEAR MATERIAL LICENSE

Supplementary Sheet

License Number SNM-344

Amendment No. 03

Docket No. 70-372

Department of the Army  
U. S. Army Chemical Center and School  
Ft. McClellan, Alabama 36201

In accordance with letter dated June 20, 1973, License Number SNM-344 is hereby terminated.

AUG 20 1973

Date \_\_\_\_\_

COPY

*Docket File*

For the U. S. Atomic Energy Commission

Original signed by  
FRANK C. DAVIS

by Materials Branch

Directorate of Licenses  
Washington, D. C. 20545



UNITED STATES ATOMIC ENERGY COMMISSION  
DIVISION OF COMPLIANCE

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

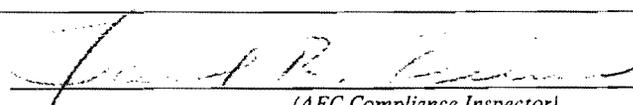
<b>1. LICENSEE</b> Department of the Army, U. S. Army Chemical Center and School Radiological Division Technical Department Fort McClellan, Alabama 36205		<b>2. REGIONAL OFFICE</b> U. S. Atomic Energy Commission Directorate of Regulatory Operations Region II, Suite 818 230 Peachtree Street N. W. Atlanta, Georgia 30303	
<b>3. DOCKET NUMBER(S)</b>		<b>4. LICENSE NUMBER(S)</b> 01-02861-01	<b>5. DATE OF INSPECTION</b> 1/29-31/73

**6. INSPECTION FINDINGS**  
 The inspection was an examination of the activities conducted under your license as they relate to radiation safety and to compliance with the Commission's rules and regulations and the conditions of your license. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector. The findings as a result of this inspection are as follows:

No items of noncompliance or unsafe conditions were found.

The following items of noncompliance related to records, signs, and labels were found:

- A. Rooms or areas were not properly posted to indicate the presence of a RADIATION AREA. 10 CFR 20.203(b) or 34.42
- B. Rooms or areas were not properly posted to indicate the presence of a HIGH RADIATION AREA. 10 CFR 20.203(c) (1) or 34.42
- C. Rooms or areas were not properly posted to indicate the presence of an AIRBORNE RADIOACTIVITY AREA. 10 CFR 20.203(d)
- D. Rooms or areas were not properly posted to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(e)
- E. Containers were not properly labeled to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(f) (1) or (f) (2)
- F. A current copy of 10 CFR 20, a copy of the license, or a copy of the operating procedures was not properly posted or made available. 10 CFR 20.206(b)
- G. Form AEC-3 was not properly posted. 10 CFR 20.206(c)
- H. Records of the radiation exposure of individuals were not properly maintained. 10 CFR 20.401(a) or 34.33(b)
- I. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b) or 34.43(d)
- J. Records of receipt, transfer, disposal, export or inventory of licensed material were not properly maintained. 10 CFR 30.51, 40.61 or 70.51
- K. Records of leak tests were not maintained as prescribed in your license, or 10 CFR 34.25(c)
- L. Records of inventories were not maintained. 10 CFR 34.26
- M. Utilization logs were not maintained. 10 CFR 34.27
- N. Records of radiation survey instrument calibration were not maintained. 10 CFR 34.24
- O. Records of teletherapy electrical interlock tests were not maintained as prescribed in your license.
- P. Other \_\_\_\_\_

  
 \_\_\_\_\_  
 (AEC Compliance Inspector)

7. The AEC Compliance Inspector has explained and I understand the items of noncompliance listed above. The items of noncompliance will be corrected within the next 30 days.

\_\_\_\_\_ (Date) \_\_\_\_\_ (Licensee Representative - Title or Position)

DRAFT INSPECTION REPORT FORM

1. Name and address of licensee  
*Dept. of the Army  
U.S. Army Chemical Center and School  
Fort McClellan, Alabama*
2. Date of Inspection *1/29-31/73*
3. Type of Inspection *R-13*
4. License number(s), docket number (s), number and date of last amendment for each license. Category and Priority of each licensee.  
*01-02861-01 Term Amendment #20 entirely dated 9/26/72  
F (I-A) II*
5. Date of previous inspection *August 11, 1971*
6. Proprietary information  
*None*
7. Scope of inspection if other than routine  
*Routine, except that discussions were held regarding the shutdown of the facilities.*
8. Participants (Licensee representatives and titles, State representatives, etc.)  
*Maj Charles J. Wickstrom, Commander, Health Physics Div  
SSgt Bartel F. Truffa, Head, Health Physics  
Pvt John B. Starr, Health Physicist*
9. Management Interview (Information required for N/C cases)  
*Reviewed results and discussed shutdown of facilities with:  
Col Jack (NMI) Vanderbleek, Commandant, Chemical School  
Col Eugene M. Simonson, Assistant Commandant*
10. Action and Date: Letter to Licensee \_\_\_\_\_  
AEC-591 Clear  *1/29-31/73*  
AEC-591 N/C \_\_\_\_\_
11. Recommended reinspection date *1/74*
12. *Paul R. Green* Inspector *2/5/73* Date of Report  
*G.T.S.* Reviewer *2/26/73* Date of Review

- 13. Inspection Summary (Including violations and safety items, and status of previously reported violations and safety items, etc.)

*There are no significant changes in this program and that found for the last several inspections. This was a clear 591 case or was the last inspection.*

- 14. Summary of Licensed Program (Kind of program, number of people, rate of use or quantities on hand, places and frequency of use, type, quantity and use as authorized, etc.)

*The licensee has continued to use licensed materials in limited quantities (usually only pic amounts) to train military personnel in radiation detection techniques. See attached inventory sheet*

- 15. Organization and Administration (Management organization, RSO, authorities and responsibilities, authorized users, qualifications, supervision, etc.)

*Major James A. Hall, Supervisor of Training  
 Col Jack (NMI) Vanderbleek, Commandant, Chemical School  
 Maj Charles J. Webster, Commander, Health Physics Div.  
 Col Josiah A. Wallace, Post Commander, Ft. McClellan*

- 16. Facilities (Use facilities, storage facilities, control of access, control devices and alarms, etc.)

*no significant changes from last inspection*

- 17. Equipment (Devices utilizing licensed mat'l, monitoring instrumentation special equipment as glove boxes, hoods, handling tools, respirators, etc.)

*continued to have numerous types of good survey equipment for use in this program.*

- 18. Radiological Safety Procedures (Written operating and emergency procedures, availability of procedures, license and regs, training, Form AEC-3, etc.)

written procedure on hand and available for use  
 Radiation Safety Committee review & approval  
 all use (See attached list of members) Health  
 Physics routinely check all areas

- 19. Personnel Monitoring and Exposure to External Radiation (Type of monitoring, range of exposures, supplier, period worn, exposure history, etc.)

and film badges supplied by Lexington Hall  
 from Army Depot on a monthly service basis  
 the highest total accumulated exposures in 1974  
 were for ~~the~~ Pryor (390 mrem) and Holmgren (937 mrem)  
 Gov. DD-1121 Form with reference AF(-4) + -5  
 requirements

- 20. Exposure of Employees to Airborne Radioactive Mat'ls (Method of evaluation, type of samples, radioisotopes, records, bioassay, etc.)

none

- 21. Effluents to Unrestricted Areas (Types, source, measurements, flow rates, applicable MPC, analytical procedures, environmental samples, etc.)

none under this label

- 22. Disposals (Methods, typical quantities, etc.)

shipped for burial by Nuclear Engineering at  
 Morehead Ky in 1972:  
 3/72 shipped 200 Co60 sources (1080 curies) in  
 DOT containers  
 7/72 two shipments of 290 Co60 sources (1572 curies)  
 and 530 Co60 sources (2917 curies)  
 Attachment to Section

23. Miscellaneous Surveys, Evaluations and Records (External radiation levels, contamination levels, leak tests, etc.)

Surveys + measurements in all areas of unit + storage -  
Make records of these once each month but  
also do daily surveys - all survey results under  
200 dpm total gamma - readings up to 50 nR/hr  
in ~~restricted area~~ but all under 0.5 nR/hr in

24. Special License Conditions

# 13. Leak tests being conducted or required - none  
also 0.005  $\mu$ Ci contamination limit -

25. Posting and Labelling

Posting as required  
Labelling as required

26. Independent Measurements (Type, results, comparison to licensee results etc.)

Make random surveys in all areas with an  
Eberline E 500 - all areas under 0.5 nR/hr except  
the following:  
Scaler Top - up to 3 nR/hr  
Storage Well - 6' down reads ~ 50 nR/hr  
Hot cell - ~~up to~~ 2 nR/hr over in center of cell

27. Operations Observed

None

28. Incidents, Overexposures, Theft or Loss, Equipment Malfunction (Those not described elsewhere should be reported here.)

None

29. Other Information or Continuation from Previous Paragraphs

None

## DISCUSSIONS WITH LICENSEE PERSONNEL REGARDING CLOSE-DOWN OF FACILITIES

During the inspection discussions were held with licensee personnel regarding the close-down of the Fort McClellan facilities which have been in use for at least ten years. These discussions were held with the following personnel:

Colonel Jack (NMI) Vanderbleek - Commandant, Chemical School  
Colonel Eugene M. Simonson - Assistant Commandant  
Major Charles J. Wickstrom - Commander, Health Physics Division  
Sergeant Bartel F. Truffa - Head, Health Physics

Wickstrom stated that the facilities are expected to be shutdown completely by July 1, 1973, but expect to have the facilities ready for shutdown by June 1, 1973. In response to a question Wickstrom said he had not received an answer from the Army as to whether or not the Fort McClellan facilities are to be part of the unrestricted area at Fort McClellan after shutdown. He and Colonel Vanderbleek and Simonson were informed that if these facilities are to be part of the unrestricted area that the radiation levels must be brought down to the levels contained in the AEC guide entitled "Guidelines For Decontamination of Facilities and Equipment Prior to Release For Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material". Several copies of this guide were given to Wickstrom. Wickstrom stated that if these facilities are to be part of the unrestricted area that the AEC guide would be followed.

During a tour of the licensee's facilities it was observed that some problem areas exist which may be difficult to get down to the radiation levels contained in the AEC guide. These areas are as follows:

1. Radiological storage area outside Lab W - This area has a concrete pad which in the past has been contaminated with Sr 90. This whole area may have to be excavated. The surface of the pad reads about 1 mr/hr.
2. In the same area above there is a 15 feet by 6 inch diameter storage well which reads up to 50 mr/hr about six feet down.
3. Hot Cell Area - This is a separate building with a shielded hot cell, manipulators etc. which reads up to 2 mr/hr on the accessible surfaces. The hot cell ductwork is known to be contaminated but the levels are not known at this time.

Wickstrom is expected to have more information in the next few days. A letter had been sent through the Army coordinator in Washington, D. C. to AEC licensing regarding the shutdown plans. I informed Wickstrom that the AEC may require information as to the procedures which will

be followed in decontaminating the facilities. In response to my question, Wickstrom stated that external radiation measurements would be made with an ANPDR-27 survey meter with a probe window thickness of 3.81 mg/cm<sup>2</sup>. Smears will be taken in all areas and counted with calibrated gas flow proportional type counting equipment. More information is expected from Major Wickstrom in the next few days.

JEC COPY  
Current as of 22 Jan 73

INVENTORY OF RADIOACTIVE MATERIAL

1. The following radioactive materials are located in the Isotope Vault, Room 35, Building 3181.

a. Twenty (20) M6, Sr-Y90 beta sources for the Radiac Calibrator, TS 784A/PD. The M6 sources have an individual activity of 19.3 millicuries. The calibrators are under BML #16-5033-1, held by Lexington Army Depot. Serial numbers of the M6 sources are as follows:

A3664	A3930	A4043	A4167
A3698	A3931	A4049	A4174
A3896	A3952	A4050	A4180
A3900	A4023	A4122	A4181
A3911	A4035	A4150	A4255

b. One (1) AN/UDM-2 Radiac Calibrator set, Serial #0005. This set contains four (4) 25 millicuries sources and one (1) 20 microcurie source of Sr-Y90. The calibrator is under BML #16-5033-1, held by Lexington Army Depot.

c. Sixty (60) Co60, gamma sources locally fabricated and mounted on copper planchets. Individual source activity is less than one microcurie. The sources are under BML #1-2861-1 held by USACMLCS.

d. Bulk liquid isotopes under BML #1-2861-1 held by USACMLCS. The isotopes, serial numbers and activity are as follows:

<u>Isotope</u>	<u>Serial No.</u>	<u>Activity</u>
Rb-86	570	10.02 mci (11 Oct 72)
<del>Au-198</del>	<del>554</del>	<del>32.1 mci (12 Jul 72)</del>
Ce-141	GN-59	10 mci (1 Feb 72)
Ag-110m	GN-45	10 mci (1 Feb 72)
Rb-86	466	5.1 mci (31 Jan 72)
Hg-203	GN-54	10 mci (21 Apr 72)
Ca-45	GN-32R	0.18 mci (Dec 71)
Co-60	Co-001	0.97 mci (Dec 71)
Ca-45	GN-61	4.99 mci (11 Apr 72)
<del>Au-198</del>	<del>580</del>	<del>32.35 mci (2 Oct 72)</del>
Cs-137	14	5.02 mci (6 Oct 72)
Sc-46	582	25.16 mci (9 Oct 72)

e. Two (2) sources under BML #1-2861-1 with the isotopes, activity and serial numbers are as follows:

<u>Isotope</u>	<u>Serial No.</u>	<u>Activity</u>
Cs137	2455	25 microcuries
Cs137	1598	25 microcuries

2. The following radioactive material is located in Laboratory W, Building 3182. One (1) Cs137, gamma source, for the AN/UDM-1A Radiac Calibrator. The source has an activity of 103 curies and serial number 86. The source is under BML #1-2861-1 held by USACMLCS.

3. The following radioactive materials are located in the Laboratory W storage vault, Building 3180.

a. Two (2) Co60 sources for the M3A1 source set. The sources have activities of 123 mci and 100 mci for serial numbers 748 and 756 respectively. These sources are under BML #19-1826-2 held by Edgewood Arsenal.

b. Sixty-eight (68) Pu239, alpha calibration sources purchased from Eberline. The sources are under SNM License #344 held by USACMLCS or SNM license #954 issued to Edgewood Arsenal. The serial numbers and activity are as follows:

<u>Serial No.</u>	<u>Activity (CPM)</u>	<u>Serial No.</u>	<u>Activity (CPM)</u>	<u>Serial No.</u>	<u>Activity (CPM)</u>
P622	1.78x10 <sup>3</sup>	P1479	10,800	P2452	1.72x10 <sup>5</sup>
P1079	17,800	P1493	1.28x10 <sup>5</sup>	P2543	13,939
P1140	1140	P1494	1.43x10 <sup>5</sup>	P2557	14,010
P1177	1.5x10 <sup>3</sup>	P1497	1.52x10 <sup>4</sup>	P2605	1.64x10 <sup>5</sup>
P1207	1080	P1501	1.33x10 <sup>6</sup>	P2606	1.65x10 <sup>5</sup>
P1266	1750	P1504	1.3x10 <sup>6</sup>	P2629	1208
P1354	1.12x10 <sup>5</sup>	P1508	10,200	P2647	11,900
P1375	1.68x10 <sup>5</sup>	P1527	1700	P2650	1.4x10 <sup>4</sup>
P1411	1.16x10 <sup>6</sup>	P1821	960	P2671	1342
P1417	1.05x10 <sup>6</sup>	P1838	1.09x10 <sup>5</sup>	P2679	12,100
P1424	1.24x10 <sup>5</sup>	P1841	1000	P2692	1.2x10 <sup>5</sup>
P1425	1.21x10 <sup>5</sup>	P1881	13,900	P2734	967
P1438	1.2x10 <sup>6</sup>	P1891	1.32x10 <sup>6</sup>	P2740	1.1x10 <sup>3</sup>
P1440	1.58x10 <sup>6</sup>	P1911	1.09x10 <sup>5</sup>	P2749	12,300
P1446	12,900	P1918	1.36x10 <sup>4</sup>	P2762	1.44x10 <sup>5</sup>
P1478	14,200	P1939	1.2x10 <sup>6</sup>	P2766	12,132
P2784	1133	P2942	1.58x10 <sup>6</sup>	P3093	1.5x10 <sup>6</sup>
P2793	11,890	P2960	1.56x10 <sup>6</sup>	P3101	1.2x10 <sup>5</sup>
P2802	1040	P2966	1358	P3134	1.6x10 <sup>6</sup>
P2853	1243	P2970	1.27x10 <sup>5</sup>	P3160	1.5x10 <sup>6</sup>
P2892	15,279	P3016	1.44x10 <sup>6</sup>	P3169	1.46x10 <sup>5</sup>
P2897	1166	P3071	1.11x10 <sup>6</sup>	P3193	1.66x10 <sup>6</sup>
P2919	1.57x10 <sup>6</sup>	P3084	1.41x10 <sup>5</sup>		

4. The following radioactive materials are located either in the Laboratory W Vault, Building 3180 or are mounted in the Alpha Field.

Four hundred and fifty (450) U233 alpha plates under SNM 344 held by USACMLCS. The serial numbers and activity are as follows:

<u>Serial No.</u>	<u>Activity (dpm)</u>
A1 -A200 (inclusive)	2x10 <sup>5</sup>
A201-A300 (inclusive)	3.9x10 <sup>5</sup>
A301-A400 (inclusive)	9.5x10 <sup>5</sup>
A401-A450 (inclusive)	1.9x10 <sup>6</sup>

5. The following radioactive materials are a component part of the AN/PDR-27 Radiac Set. The MX7338 sources contain 5 millicuries of Krypton 85 and are stored in Laboratory W Vault, Building 3180. The sources are under BML #19-1826-2 held by Edgewood Arsenal. The last two in the list are stored in Building 1763 and are used by the Alpha Team.

One hundred five (105) MX7338:

K-3065	K-3080	K-3095	K-3110	K-3125	K-3140	K-3155
K-3066	K-3081	K-3096	K-3111	K-3126	K-3141	K-3156
K-3067	K-3082	K-3097	K-3112	K-3127	K-3142	K-3157
K-3068	K-3083	K-3098	K-3113	K-3128	K-3143	K-3158
K-3069	K-3084	K-3099	K-3114	K-3129	K-3144	K-3159
K-3070	K-3085	K-3100	K-3115	K-3130	K-3145	K-3160
K-3071	K-3086	K-3101	K-3116	K-3131	K-3146	K-3161
K-3072	K-3087	K-3102	K-3117	K-3132	K-3147	K-3162
K-3073	K-3088	K-3103	K-3118	K-3133	K-3148	K-3163
K-3074	K-3089	K-3104	K-3119	K-3134	K-3149	K-3164
K-3075	K-3090	K-3105	K-3120	K-3135	K-3150	K-3165
K-3076	K-3091	K-3106	K-3121	K-3136	K-3151	K-3166
K-3077	K-3092	K-3107	K-3122	K-3137	K-3152	K-3167
K-3078	K-3093	K-3108	K-3123	K-3138	K-3153	K-3168
K-3079	K-3094	K-3109	K-3124	K-3139	K-3154	K-3169

6. The following radioactive materials under BML #1-2861-1 held by the USACMLCS. They are located in Laboratory W Vault, Building 3180.

<u>Isotope</u>	<u>Serial No.</u>	<u>Activity</u>
Cs137	60251	93.1 millicuries
Cs137	60252	93.1 millicuries
Cs137	60253	186.2 millicuries
Cs137	60254	186.2 millicuries
Cs137	60255	465.4 millicuries
Cs137	60256	465.4 millicuries

0.5

7. The following are AN/PDR 39A Radiac Sets containing 45 microcuries of Sr-90 each as integral parts of the sets. The AN/PDR 39A Radiac Sets are stored in Radiological Laboratory "W" Building 3182.

Nine (9) AN/PDR 39A Radiac Sets:

613	630	6582
623	659	LSD 49
629	673	LSD 319

## INVENTORY OF LOW LEVEL SOURCES

1. The following radioactive materials contain extremely small quantities of various radioisotopes and are exempt from AEC Licensing and DA Authorization requirements.

Beta-gamma source sets from commercial manufacturers. The sources have an individual activity of less than one tenth of a microcurie. The sources are located in the Isotope Storage Vault, Room 35, Building 3181. The radioisotopes have the following serial numbers:

<u>Isotope</u>	<u>Serial No.</u>	<u>Isotope</u>	<u>Serial No.</u>
Tl204	5182	Co60	ICN.0736 uci
Bi210	5222	Co60	ICN.0738 uci
Ru106	5232	Co60	ICN.0754 uci
Bi210	5335	Sim P-32	ICN.0517 uci
<del>Co60</del>	<del>3249</del>	(Natural U)	
<del>Mn54</del>	<del>3236</del>	Sim P-32	ICN.0510 uci
<del>Cs137</del>	<del>3266</del>	(Natural U)	
<del>Na22</del>	<del>3260</del>	Sim P-32	ICN.0602 uci
<del>Co57</del>	<del>3279</del>	(Natural U)	
Pa234	NENC	C-14	ICN 5.37x10 <sup>4</sup> dpm
C14	NENC	C-14	ICN 5.19x10 <sup>4</sup> dpm
Co60	NENC	C-14	ICN 4.81x10 <sup>4</sup> dpm
Tl204	NENC		
Bi210	NENC		

2. The following radioactive materials are exempt from AEC licensing and DA Authorization requirements. The radioisotopes are located in the Isotope Vault, Room 35, Building 3181. The calibration check sources are beta-gamma emitters. The isotopes, activity and serial numbers are as follows:

<u>Isotope</u>	<u>Serial No.</u>	<u>Activity</u>
C14	5158	0.57 microcurie
Co60	5192	.95 microcurie
Co60	P389	.0043 microcurie
Co60	P276	.0076 microcurie

3. One (1) U238, alpha calibration source, serial number P647, with an activity of 405 dps. The source is held under the general licensing provisions of para 40.22, 10CFR. The source is located in the Isotope Lab Vault, Room 35, Building 3181.

4. The following radioactive materials are low-level calibration sources in unlicensed quantities. The sources are located in the Isotope Lab Vault, Room 35, Building 3181.

<u>Isotope</u>	<u>Serial No.</u>	<u>Activity</u>
Na22	25-1314	less than 1 microcurie
Cs137	25-1313	less than 1 microcurie
Mn54	25-1312	less than 1 microcurie
Ba133	25-1311	less than 1 microcurie
Co60	25-1315	less than 1 microcurie
Co60	25-1215	less than 1 microcurie
Co60	25-1045	less than 1 microcurie
Cs137	25-1194 (4 ea)	less than 1 microcurie
SIM-I131	25-1041	less than 1 microcurie
Cs137	25-1213	less than 1 microcurie
Cs137	25-1043	less than 1 microcurie

5. The following are either articles of equipment or copper planchets containing Ca 45 sealed in plastic bags. Each bag contains less than one microcurie of Ca 45 and is stored in the instrument storage room, Building 3182. The Ca45 is licensed under BML #1-2861-1 held by USACMLCS. SEE NOTE.

Nine (9) Bags:

1	D	J
4	E	M
8	G	S

6. The following are either articles of equipment or copper planchets containing Ag 110m sealed in plastic bags. Each bag contains less than one microcurie of Ag 110m and is stored in the instrument storage room, Building 3182. The Ag110m is licensed under BML #1-2861-1 held by USACMLCS. SEE NOTE.

Fourteen (14) Bags:

2	B	I	Q	A2
5	C	K	R	B2
7	H	N	T	

7. The following low-level sources are liquid scintillation standards and are covered under BML #01-02861-01 issued to USACMLCS. The sources are stored in the Isotope Vault, Room 35, Building 3181.

<u>Isotope</u>	<u>Activity</u>
C-14	$4.17 \times 10^5$ dpm
C-14	$4.99 \times 10^5$ dpm
C-14	$4.55 \times 10^4$ dpm

8. A 40 microcurie Cs-137 internal calibration source as an integral part of the Beckman Beta Mate liquid scintillation counter. The source is licensed under a general license held by Beckman Corporation. It is located in the Isotope Laboratory, Room 35, Building 3181.

NOTE: The following eleven (11) bags contain no radioactive material:  
3, 6, A, F, L, O, P, A1, A3, B1 and B3.

To: J. A. C. t. in. utterland 2/5/73  
Acting Chief, Radiological and Environmental  
Protection Branch

Subject: Inspector Evaluation  
Dept. of the Army  
Fort McClellan, Alabama  
License Nos 1-2861-1 and -2, SVM-322

The licensee is continuing to conduct a program under the three licenses in a reasonably safe manner and in compliance with license and regulation requirements. No significant problems have been encountered with this program for several inspections. The licensee is now in the process of closing down the facilities which most likely will be accomplished in a safe manner and in full compliance with AEC requirements. This is expected to be accomplished by July 1, 1973 and RO:II should make a final inspection on or about June 1, 1973.

Paul R. Green  
Radiation Specialist

1/2/73  
2/5/73

RADIATION SAFETY COMMITTEE MEMBERS  
(formerly Isotope Committee)

JAN 73

ASSISTANT COMMANDANT	COL SIMONSON	3618
DIRECTOR OF INSTRUCTION	LTC ARMSTRONG	3226
DIRECTOR OF RESIDENT INSTRUCTION	LTC ROARK	3624
C, OFFICE OF LOGISTICS	LTC HODGES	4724
C, TECHNICAL GROUP	LTC FOSTER	3411
MEDICAL OFFICER, NAH	MAJ WAGNER	5526
C, HEALTH PHYSICS DIVISION	MAJ WICKSTROM	3937
NAVAL TRAINING UNIT REPRESENTATIVE	LT ADLER	4894
RADIOLOGICAL COMMITTEE REPRESENTATIVE	MR BRADLEY	3712
CENTER SAFETY DIRECTOR	MR DANIEL	4723

COPILOT OF LICENSED BYPRODUCT MATERIAL  
FOR THE USE OF THE RADIATION PROTECTION DEPARTMENT

Use of byproduct material is limited to the program requested in Items 8 through 15. Use of byproduct material is limited to all applications. Mail three copies to U. S. Atomic Energy Commission, Radiological Branch, Division of Licensing and Regulation. Upon approval of this application, the licensee will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc.)  Department of the Army U. S. Army Chemical Center and School Fort McClellan, Alabama 36201.	(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).)
2. DEPARTMENT TO USE BYPRODUCT MATERIAL  Radiological Branch, Technical Division USACMICS	3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)  Renewal: BML No. 1-2861-2 (C 68)
4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)  MAJ John A. Mojecki Chief, Radiological Branch Technical Division	5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)  CPT Charles M. Lutz Chief, Health Physics Office
6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)  Bromine 82 Bromine 80 Potassium 42 Sodium 24	(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)  10,000 millicuries 1,750 millicuries 900 millicuries 750 millicuries  Potassium bromide (KBr) to be provided and irradiated by a commercial firm.
7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)  To be used in the Model 11F3A Radiological Trainer Device for decontamination training in the Radiological Decontamination Training Facility.	

S4439

Incl 1

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 01-02861-01

Amendment No. 21

Department of the Army  
U. S. Army Chemical Center and School  
Radiological Division  
Technical Department  
Fort McClellan, Alabama 36205

In accordance with letter dated March 12, 1973, License Number 01-02861-01  
is amended as follows:

Conditions 12. and 14. are amended to read:

12. Byproduct material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation Safety Committee.
14. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated March 17, 1967; U. S. Army Chemical Center and School Memorandum Number 385-2, dated January 3, 1973; and letters dated August 15, 1972, September 12, 1972, and March 12, 1973.

For the U. S. Atomic Energy Commission

Original Signed By

Robert E. Brinkman  
Materials Branch

by

Directorate of Licensing  
Washington, D. C. 20545

Date MAR 27 1973

*REB*  
*REB/cook*

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE  
Supplementary Sheet

License Number 01-02861-01

**Amendment No. 22**

Department of the Army  
U. S. Army Chemical Center  
and School  
Radiological Division  
Technical Department  
Fort McClellan, Alabama 36205

License Number 01-02861-01 is hereby terminated.

Date JUL 26 1973

For the U. S. Atomic Energy Commission

Original Signed By  
Robert E. Brinkman

by Robert E. Brinkman

Directorate of Licensing  
Washington, D. C. 20545

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Coch*

U. S. ATOMIC ENERGY COMMISSION  
PRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 01-02861-0

Amendment No. 08

Department of the Army  
U. S. Army Chemical Center  
and School  
Radiological Division  
Technical Department  
Fort McClellan, Alabama 36205

License Number 01-02861-02 is hereby terminated.

RECEIVED  
GENERAL INVESTIGATIONS  
DIVISION  
AUG 1 1973

REC-5  
AUG 5 2 50 PM '73

For the U. S. Atomic Energy Commission

Original Signed By

Robert E. Brinkman

by Materials Branch

Directorate of Licensing  
Washington, D. C. 20545

Date JUL 26 1973

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS. - Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the licensee is subject to Title 10, Code of Federal Regulations, Part 20.

<p>1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc. Include ZIP Code.)</p> <p>COMMANDER, US Army School/Training Center Fort McClellan, Alabama 36201</p> <p>ATTN: AJMGP-S-S</p>	<p>(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1 (a). Include ZIP Code.)</p> <p>Material is residual contamination in three places at Fort McClellan, all within fenced area behind Building 3182.</p>
<p>2. DEPARTMENT TO USE BYPRODUCT MATERIAL</p> <p>Material will not be used. The Fort McClellan Radiological Protection Officer will be the action officer.</p>	<p>3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.) Material formerly under BML-1-2861-1, which will be cancelled 24 Jun 73. THIS IS NOT A RENEWAL OR AMENDMENT APPLICATION.</p>
<p>4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)</p> <p>NO USERS</p>	<p>5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)</p> <p>Mr. Charlie U. Daniel, Jr.</p>

<p>6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each)</p> <p>Primarily Cobalt-60 (Presence verified by United States Army Environmental Hygiene Agency (USAEHA)). Some Cesium-137 (presence suspected)</p>	<p>(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)</p> <p>Chemical form is not known. Physical form is small solid particles absorbed and adsorbed onto permanent metal and concrete surfaces in three places, all within the fenced area behind Building 3182. Contained within this area is Building 3192, formerly known and referred to as the Hot Cell Facility. Maximum dose rate is 65 mr/hr. Precise curiage unknown; estimated amount is 10 millicuries. See map attached to proposed Post Regulation, "Residual Radiological Contamination Safety Program", for locations of contamination. Recent wipe tests show that, even after decontamination efforts, considerable removable contamination exists within the Hot Cell portion of building 3192 (up to 550,000 dpm). This portion of the building has been walled off for safety reasons. Decontamination of USACMCS at Fort McClellan has been carried out in accordance with U S Army Environmental Hygiene Agency Report 43-041-73 and AEC Region II Director of Regulatory Operations guidance, both of which sources recommended leaving these three places contaminated due to time, money, and hazard difficulty in decon.</p>
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7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for human use, Supplement A, Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

Material is residual contamination and cannot be used in the normal sense of the word. No use of any type is planned.

CLOSE-OUT - HEALTH PHY DIV

21 Feb 73 - SSG Truffa did a rough survey of the Rad Lab Vault. The first survey was done with a PGI probe, plotting the  $10^{5d} 2 \times 10^6$  CPM contours, going back over the vault with an AN/PDR-27, the General Background was 0.1 mr/hr in the vault (with all sources removed) hot spots of 210 mr/hr, 110 mr/hr, and 16 mr/hr were found on the floor, the general BG on the surface of the floor with the Beta shield open ranged between 0.2 and 0.4 mr/hr, although spots ranged from 0.5 - 1.5 mr/hr.

SSG Truffa started the recirculation pump to the 1,500-gal tank at 1410 hrs. This is in preparation of drawing another water sample for AEHA. SSG Truffa also drew a tap water sample as a background sample for AEHA.

22 Feb 73 - SSG Truffa drew a sample for the AEHA from the 1,500-gal hot cell storage tank. Both this sample and the one taken yesterday were packaged in a wooden box and will be shipped to AEHA ASAP.

23 Feb 73 - SSG Truffa took paint and cement samples in the Rad Lab Vault. Conclusion: Only one paint sample came out "hot" and this was in the vicinity of the two spots reading 210 mr/hr and 110 mr/hr. The walls and ceiling appear to be clean. Recommendation: (1) Remove "3 hot spots" by jackhammer. (2) Vacuum up all dust and debris. (3) Resurvey using PG2 and PRM-5. (4) Repeat steps 1 - 3 for any other "hot spots" found. Ran liquid scint count on sample - 2 peaks, results inclusive.

26 Feb 73 - Ran sample thru single channel analyzer, results: Cs137 conclusive.

27 Feb 73 - SSG Truffa vacuumed the Rad Lab Vault and spray painted over the chipped surfaces to seal the contamination.

1 Mar 73 - SSG Truffa collected the waste from Lab "T" and the Isotope Lab, and began an extensive survey of the Isotope Hood. A hot spot was found on the lead glass and was rewiped until within limits. One hot spot was found on a metal plate which will be disposed of. The survey is being performed with the PRM-5 and the fiddler probe, and AN/PDR27 with the beta window exposed and swipe tests for removable contamination. The liquid samples asked for by MAJ Lodde of AEHA were given to Ofc of Log for shipment.

2 Mar 73 - SSG Truffa continued the survey of the Isotope hood. The rear wall of the hood was removed and was found to be contaminated to about 0.1 mrad/hr and 10,000 DPM/500cm<sup>2</sup> maximum on the reverse side.

5 Mar 73 - SSG Truffa wiped off the reverse of the rear wall with damp sponges and rewiped the surfaces, the maximum removable was about 2,000 DPM/500cm<sup>2</sup> - SP4 Holdeman was informed and said he would try to decon it further using a decon solution. SSG Truffa vacuumed the floor in the area of the hood. The reading on the inside rear wall of the hood ranged from 0.07 to 0.15 mrad/hr.

A decon solution was made up and applied 3 times, using steel wool. The majority of the rust was removed and the readings dropped to between 0.04 and 0.1 mrad/hr. Removable contamination will be further evaluated. The hood was further dismantled, taking out the pre-filter which was contaminated and the overhang above the glass was found to read up to 0.2 mrad/hr.

8 Mar 73 - SSG Truffa vacuumed around hood and further dismantled the hood to get to the MSA filter. These parts read up to 0.17 mrad/hr. The MSA Filter was removed and found to be not contaminated.

5-7Mar 73 - Eng (46th) constructed wall between classroom and Hot Cell controls - will finish Monday.

9 Mar 73 - Eng (Post) dug drainage trenches in Hot Cell yard - will return 12 Mar 73 to finish.

9 Mar 73 - SSG Truffa surveyed the duct work from the Isotope hood to the roof exhaust. The duct work appears contaminated as does the exhaust assembly on the roof readings appear uniform at about 0.2 mr/hr. The rest of the day was spent in trying to locate the duct work between the ceiling of the 2d floor and the roof and finding the keys to rooms the duct work came through - all without success.

12 Mar 73 - SSG Truffa found the keys to the rooms with the duct work. The duct work reads between 0.04 and 0.07 mrad/hr on contact as far as SSG Truffa could follow it. Eng finished trench work and started waterproofing around liquid disposal pit.

13 Mar 73 - Work was begun to break up and remove the concrete pad surrounding Bldg 3180. A 5-man detail was supplied by Sch Bn and an NCOIC, crane operator, and driver for a 5-ton dump truck were supplied by 46th Eng. Initially, the concrete slab was watered down and covered with burlap to keep the dust low. The slab was broken up using the crane and a 3-ton metal ball. An air sample was run during the entire operation. Prior to the slab break-up, all the sources from the Vault were removed and placed in Lab "W" for safety and security. The highest readings found were 15 mrad/hr and this was on one of many lead bricks apparently used for shielding before the concrete was poured over it. Although the plaque marking the spill identified the isotope as Sr-90, the reading with the beta window open and closed and AN/PDR-27 showed no change, indicating a gamma emitter. The dose rates encountered did not approach the 300 mrad/hr expected. The dose rates found indicate the spill was spread before the concrete was laid or the isotope had gone through at least 5 half lifes or a half life of about 3 years. The concrete was removed and placed in 55-gal drums. The area was reduced to below 0.4 mrad/hr with a few spots as high as 2 mrad/hr before quitting. 33 55-gal drums were filled. Air samples did not even come to twice background on immediate count.

14 Mar 73 - Sch Bn supplied another 5-man detail, 46th Eng supplied an NCOIC and crane operator. The remainder of the pad was broken up and filled 10 more 55-gal drums. Air samples were negative. The area was down to 0.1 mrad/hr in general with hot spots of 0.3 mrad/hr. Although these spots are within allowable limits, attempts will be made later to lower them further.

In the afternoon, 2 people from the 46th Eng and SSG Truffa started chipping up the floor of the Rad Lab Vault using an impact hammer, a broom to hold down the dust and the vacuum cleaner. The 210 and 110 mrad/hr spots were removed first and the area surrounding it had to be removed. Some areas around the removed portion are still reading 2 mrad/hr and must be further removed.

15 Mar 73 - SSG Truffa and 2 people from 46th Eng were able to get a little more of the floor in the vault chipped up in the afternoon. The Eng also brought the radiation warning signs for the Hot Cell and liquid waste system.

16 Mar 73 - Because of rain, the Eng (46th) worked on the wall in the Hot Cell. SSG Truffa spray painted the floor of the vault where the chipping was done and moved the sources back into the vault.

19 Mar 73 - 46th Eng worked on wall in Hot Cell and started painting wall. A 4-man detail from Sch Bn, SSG Truffa and MAJ Wickstrom went to Iron Mountain to remove contaminated dirt. Four hot spots were found, ranging from 0.5 to 2.3 mrad/hr. One of the spots went down to about 3-4 ft and was still over 0.5 mrad/hr. It was decided to get a back-hoe to remove the rest of the hot spot. Eight 55-gal drums of dirt were removed.

20 Mar 73 - 46th Eng worked on painting wall in Hot Cell and started to construct the barrier for the rear portion of the Hot Cell.

23 Mar 73 - Sch Bn furnished a 4-man detail, 46th Eng furnished cement, gravel, sand and 3 people to mix concrete and fill in the two wells around and in Bldg 3180 (Rad Lab Vault). The detail was also used to move and monitor 55-gal drums. A total of 36 drums were monitored at the surface and at 1 meter.

26 Mar 73 - 46th Eng filled in holes made by removing contamination in vault. Started putting up signs.

27 Mar 73 - 46th Eng finished putting up signs except the one for the barrier. Helped SSG Truffa monitor 6 more 55-gal drums.

28 Mar 73 - Post Eng came to pick up dirt generated in improving the drainage in the yard.

29 Mar 73 - 46th Eng filled the drains in the Hot Cell bldg after Post Eng disconnected the gas, water and steam lines. Started storing hot cell related items in the hot cell block.

5 Apr 73 - 46th Eng helped take apart shelves in main area of bldg, then welded shut Hot Cell door and put up barrier. SSG Truffa started vacuuming top of Hot Cell and general clean-up. Took water samples from around Storage Vault. All were less than background. Eng also cut off top of the well around the storage vault and melted the lead linings from around the contaminated pipe in the storage yard. Barrier was completed and sign put up.

10 Apr 73 - Post Eng cut electric power to the Hot Cell. Decon of hot spots in Lab "W" and rest of bldg was begun by SSG Truffa and 46th Eng. The contamination was removed by use of the impact hammer and vacuum cleaner. Holes were filled in with mortar.

11 Apr 73 - Post Eng disconnected water cooler in Bldg 3182 so decon work could be done. The door frame in the museum was cut and left to soak in a decon solution overnight. SSG Truffa packaged 4TS784's for shipment and monitored the Scaler Lab with the PG-2 and the floor monitor, checking indications of "hot spots" with an AN/PDR27. No contamination noted.

12 Apr 73 - SSG Truffa checked contaminated door frame and further decon work was necessary. After 12 washings with concentrated hydrochloric acid, the readings were down to about 0.1 mrad/hr using an AN/PDR27 with the beta shield open. Decon was continued by 46th Eng and the spot where the water cooler was and the spot below the door jamb in the museum. All the holes were filled with mortar and Lab "W" was retiled over the deconed areas. Work was begun on replacing tile blocks that had to be removed from the walls. SSG Truffa finished packing up the 20 TS784's.

13 Apr 73 - 46th Eng continued patching and retiling operations.

16 Apr 73 - 46th Eng continues patching operations. SSG Truffa removed all the liquid waste from the Isotope Vault and placed it in concrete, lined drum #1 and poured cement over it. This drum will be disposed of as waste. All the lead pipe used for storage of liquid waste were monitored with an AN/PDR27 with the beta shield open. All those found contaminated were disposed of. Water cooler was reconnected.

17 Apr 73 - 46th Eng finished patching decon work in Lab "W" and hallway. SSG Truffa met with MAJ Neubert to find out what was needed to be done in the Isotope Vault (which isotopes were to be transferred and which disposed of).

18 Apr 73 - A 5-man detail was supplied by Sch Bn for 46th Eng. A concrete apron was poured to replace the pad that was taken up around the Rad Lab Vault (Bldg 3180). Sixteen more 55-gal drums were monitored (total 59 drums monitored). All radioactive material was removed from the Isotope Vault, 16-TS784's were labeled and monitoring of the vault was begun by SSG Truffa.

19 Apr 73 - 46th Eng worked on concrete apron. SSG Truffa took wipes and Bromine Pad, all wipes were less than 200 DPM except those taken in the 11F3A Bromine device which ranged around 1000 to 7000 DPM. The remaining 4TS784's were labeled and all 20 were stenciled with "USA DOT 7A TYPE A RADIOACTIVE MATERIAL FACILITY ENG USAS/TC FT MCCLELLAN, AL 36201" IAW Tariff 25.

20 Apr 73 - 46th Eng worked on concrete apron.

21 Apr 73 - SSG Truffa packaged most of the low-level calibration and check sources and surveyed most of the Isotope Vault with the floor monitor and an AN/PDR27. No hot spots were noted. Also numbered the 55-gal waste drums out in the yard.

23 Apr 73 - 46th Eng welded back the deconed door jamb in the museum. 46th Eng also worked on fabricating a shipping container for the 6 Cs137 sources. SSG Truffa surveyed the museum with the PG2 and an AN/PDR27 and found several hot spots, one ranging up to about 0.50 mrad/hr and one spot about 0.3 for a distance of 7' along the baseboard. SSG Truffa also wipe tested the Cs137 sources.

24 Apr 73 - 46th Eng continued to work on shipping container and looked at work to be done in Isotope Lab, on hood ducts and ceiling. It was established by SSG Truffa that the serial number of the AN/UDM-1A was 10 and not 86, as had been listed on the radioisotope inventory. The serial number 86 had belonged to the AN/UDM-1 which was modified to the AN/UDM-1A. SSG Truffa also emptied the Radioactive waste from the vacuum cleaner and started to package the AN/UDM-2. A long count ( /6 hr) was begun on the wipe taken out of the 11F3A to determine half-life.

25 Apr 73 - 46th Eng took down ductwork in Isotope Lab. SSG Truffa surveyed with AN/PDR27. It does not appear contaminated. Post Eng came to check pumps in liquid waste control pit; nothing wrong. SSG Truffa wiped the 17-AN/UDM6 source sets. No excess leakage. Moved all 17 UDM 6's and 85MX7338's to the Isotope Vault in preparation for packaging. Packaged 8 boxes of office supplies from the office for shipment to Edgewood Arsenal. Started another long count on the 11F3A sample.

26 Apr 73 - 46th Eng completed the shipping container for the Cs137 sources. The sources were packaged in the container and locked with a chain by SSG Truffa. Sch Bn supplied a 4-man detail to work on the Alpha Field. All 407 alpha plates were removed from the concrete blocks and flushed with water to remove loose dirt and leaves. 172 of the plates were washed in a soap solution with a sponge and put through 2 rinses, then placed in the slotted boxes. The radioactive material signs were removed from the fence around the Alpha Field. The Bromine capsule was removed from the Bromine Field and placed in a 55-gal drum and the high radiation area signs were removed from the fence around the Bromine Field. The long count was continued on the wipe from the 11F3A.

27 Apr 73 - SSG Truffa washed the remaining 235 alpha plates and placed them in boxes as was done 26 Apr 73. All 407 plates were taken to the Rad Lab Vault. 407 plates from the field, 22 stored in Rad Lab Vault and 21 packaged as leakers \* 450 plates, all accounted for. Several concrete blocks and the soil around them were checked with an AN/PDR60. No indications of contamination were noted. Water samples were taken from the wash and rinse waters. Soil samples were taken from the soil on and around the cement blocks. Some of the water samples appear slightly contaminated, but not the soil samples. The exact amount of contamination will have to be determined by long counting techniques.

1 May 73 - Sch Bn supplied a 4-man detail and SP4 Holdeman was borrowed from Rad Com to supervise the detail. All the concrete blocks were taken up and moved to the hard stand by the Bromine Field. The garbage cans were moved outside the fence with the fake bomb and drums. All the radiation area signs were gathered up and taken to the Hot Cell along with the nuts and metal pieces for the blocks. The blocks were checked by SP4 Holdeman using an AN/PDR60 alpha counter and the fiddler probe from the broken arrow kit for the U233 pulse height of 17 KEU. No contamination was noted. SP4 Starr and SSG Truffa leak tested the 429 alpha plates. The contaminated bags were moved to the vault. SSG Truffa packed another box of expendable supplies. Long counts were taken on the liquid waste water from the alpha plates.

2 May 73 - 46th Eng finished taking up the contamination in the museum and were told that the 3/4-ton truck and the wall lockers could be turned into Post PPO but the APC, airframe and radar unit would have to go to Anniston Army Depot. SP4 Starr wipe tested the Isotope Lab and Vault, Lab "T" and the storage bins from the vault. The storage bin wipes were counted and the highest levels were 169 DPM/100cm<sup>2</sup>. Sch Bn supplied one M12-PDDA and operator to spray off the mud and dirt from the alpha blocks. Two tanks of water were used (1,000 gal of water). SSG Truffa completed counting the water samples and calculates to less than 0.2 uCi. Also packed 4 more boxes for shipment.

3 May 73 - 46th Eng started patching up the decon work in the museum. SP4 Starr continued counting the alpha plate wipes. SSG Truffa packed seven boxes of technical reference material and dosimetry records. Also started packaging AN/UDM 6's and Mx7338's. Made DOT 7A plate for Cs137 source container.

4 May 73 - 46th Eng continued work on museum. SP4 Starr continued counting alpha wipes. SSG Truffa continued counting Isotope and Lab "T" wipes.

7 May 73 - 46th Eng finished work on museum and worked on taking wings off the aircraft on the Bromine Pad. SSG Truffa submitted work order for boxes for radioactive material and the scalers. Also submitted the disposition request for radioactive waste for typing. Made up the radioactive labels for the 55-gal drums of waste. Boxed up 14 UDM 6's for shipment. Finished counting alpha wipes and Lab "T". All wipes within limits. Placed 4 film badges at various spots in the Hot Cell to determine approximate doses to personnel who might work in these areas. Started the pump to pump out the liquid waste disposal tanks for the Hot Cell system.

8 May 73 - SSG Truffa weighed all the radioactive material being shipped to APG, got the cube and took readings on all the boxes at the surface and at one meter. Numbered the boxes 1-43/43. Moved the 2-M3A1 source sets from the Rad Lab Vault to the Isotope Vault. Started to write the request for transportation of the 43 boxes of radioactive material to go to APG.

9 May 73 - SSG Truffa finished and submitted the request for transportation of the 43 boxes of radioactive material to APG for typing. Moved the 2 55-gal drums from the Isotope Lab to the storage yard and dumped the waste from the Hot Cell. Surveyed the lead for contamination and found one brick and a lead ring contaminated, put into 55-gal drum. Surveyed the lead storage pigs and found 6 contaminated along

with 1 top. Put all in 55-gal drums. The waste container from the Hot Cell was contaminated also. Took the crash bar and beat it small enough to fit into a 55-gal drum. Checked the 30-gal temporary storage drums and found no contamination with the AN/PDR27 and also the PRM-5 with the PG2 probe. No indications of contamination. Surveyed the storage yard where the background was low enough to allow it. The storage well concrete needs to be taken up, reading about 0.5 mrad/hr with an AN/PDR-27. The Northeast corner of the vault reads about 0.3 mrad/hr and will be taken up. Found a spot on the South side of the vault reading 2 mrad/hr and a spot near Lab "W" reading 35 mrad/hr. Both will be taken up. Finish putting corners on the boxes of Rad material for shipment to APG. Also finished labeling the M3A1 source sets. The alpha plates, the contaminated bagged equipment, 3 UDM 6's and the Cs137 sources need to be completed yet. Shut off the liquid waste pump and closed all valves except one, allowing the pump to pump directly to the sanitary sewer. Using the AEHA figures for the sample, we sent of  $3.6 \times 10^5$  uCi/me, 700 gal calculates to 95.4 uCi of Co-60 dumped.

10 May 73 - SSG Truffa sent out letter requesting disposition instructions on radioactive waste drums and DF requesting truck (van) for source shipment to APG. Made up letter to cancel film badge service and start at APG. Did calculation in preparation to dump Bromine tanks. Dumped Bromine tanks 3 & 4 and alpha plate wash and rinse water. Found pig on Bromine Pad contaminated, will put in drum. Showed 46th Eng what had to be done and told them of plans to put Bromine Pad items on Pelham Range for targets. Took down alpha field sign. Took the lock off the gate and opened the gates. Put the alpha plate wash and rinse buckets in waste drum. Took the lock off the Bromine Pad final discharge valve.

11 May 73 - 46th Eng worked on Bromine Pad to get pad items ready for transfer. SSG Truffa retrieved environmental check film badges. Time of exposure 127 hrs. Sent request to change film badge service.

14 May 73 - 46th Eng worked on airframe on Bromine Pad. Sch Bn supplied a 5-man detail for Iron Mountain. Post Eng supplied a backhoe. Backhoe dug down to about 7-8'. Highest readings found, 1.5 mrad/hr filled  $3\frac{1}{2}$  55-gal drums with dirt. Filled back in hole and readings now 0.20-0.25 mrad/hr at the surface with an AN/PDR27. Neutron source was leak tested and packaged for shipment. The area of Lab "W" where the neutron source was located was surveyed with the PRM5 and PG2 probe. No indications of contamination were found. The neutron source was put in the Isotope Vault. All sources have now been closed in their shipping containers except the AN/UDM-1A and 3 commercial scaler calibration sources. All shipping containers have been marked and labeled except the Cs137 source container. All shipping containers must now be banded and the "TO" and "FROM" labels put on them.

15 May 73 - Got transportation request into transportation on 75 55-gal drums of waste and neutron source. 46th ENG started to clean up storage yard. SSG Truffa banded and put address labels on all radioactive source containers except the Cs137 container and 3 scaler calibration sources-all sources except those and the AN/UDM1A are ready to go.

16 May 73 - Gave remaining uncontaminated lead to 46th Eng and they began cleaning storage yard with help of 3-man detail from Sch Bn. Took 2 5-ton dump trucks from storage yard, Bromine Pad, Alpha Field and Hot Cell. Sch Bn furnished 2½-ton truck and driver w/ 3-man detail to take over sample of 55-gal drums to Transportation to be weighed. Drum #53-475 lbs, #52-728lbs, #45-676 lbs, #66-546 lbs, #1-1,038 lbs. With about 20 55-gal drums well under 200 lbs, 500 lbs per drum was agreed upon as a good estimate.

17 May 73 - Shipped out 43 containers of sources to APG by Roadway Trucking Co. 46th Eng started decon work on 8 hot spots in storage yard. SSG Truffa packed up radiation signs and checked fence line for signs.

18 May 73 - Sch Bn supplied a 6-man detail to tighten the lids on the 74 55-gal drums. Also labeled them. 46th Eng finished decon of 4 hot spots in yard. Post Eng crated up NBIF and all but source container of AN/UDM-1A which was lifted off with help of detail.

20 May 73 - SSG Truffa filled 75th 55-gal drum, dried out 3-ton container and wipe tested the two 3-ton containers. The 3-tons are slightly contaminated, one reads 0.15 mrad/hr while the other does not indicate any meter readings on the AN/PDR27. Both indicate removable contamination less than 400 DPM/100cm<sup>2</sup>. Sampled liquid waste in Isotope Lab, results negative.

21 May 73 - Sch Bn supplied a 4-man detail. The 75 55-gal drums were loaded and shipped by Bowman Trans, Inc. The neutron source was shipped out and SSG Truffa cleared and packed some more of Hot Cell. Checked Storage Yard with PRM 5 w/ PG2 and AN/PDR27; no spots found over limits.

22 May 73 - 46th Eng moved the APC and 3/4-ton truck to Pelham Range from the Bromine Pad. SSG Truffa cleaned up Hot Cell maintenance area in preparation for AEHA inspection.

23 May 73 - 46th Eng moved airframe and radar unit to Pelham Range.

24 May 73 - AN/UDM-1A shipping container was received. Navy supplied 4 personnel and Ofc of Log supplied 2 personnel to load the AN/UDM-1A. MAJ Wickstrom supervised. The container was marked and all documents completed. Alpha Field was plowed up by Post Eng.

25 May 73 - AN/UDM-1A was turned over to Transportation for shipment. 46th Eng continued cleanup of Rad areas. Sch Bn Supplied 4-man detail to mow the grass.

29 May 73 - The AEHA Team of MAJ Loddie and Mr. Wilborn began their inspection. The following areas were checked: Bldg 3182, 3180, Iron Mountain, Rad Labs in Bldg 3181 and the Storage Yard. One spot was found in Bldg 3180 reading about 5 mrad/hr at the surface and one in Bldg 3182 reading about 2 mrad/hr. It was decided some of the soil in the Storage Yard would have to come up. 46th Eng supplied 2 men to remove the contaminated concrete in the Bldgs and Sch Bn supplied 4 men to remove the dirt. 3 55-gal drums of dirt were removed.

30 May 73 - AEHA inspection continued the following areas were checked: Hot Cell, Alpha Field, Bromine Pad and liquid waste control pit. The Team also took 40 swipes in the various areas and one soil sample from the Alpha Field. No more "hot spots" were located. The 2 vacuum cleaners were readied to ship with the 3 55-gal drums of waste to APG. As a result, 5 55-gal drums and the tank vacuum were marked and placed on a 2½-ton truck for convoy to APG. Earl Wright was notified of the details. SSG Truffa started counting the wipes AEHA had taken.

31 May 73 - Mr. Wilborn and SSG Truffa finished counting swipes. All swipes less than 1000 DPM/100 sq cm. Only swipes taken in controlled areas (Hot Cell roof and liquid waste pit) exceeded 114 DPM/100 sq cm, but all were less than 1000 DPM/100 sq cm. AEHA Team briefed COL Vanderbleek, Commandant, USACMLCS, and COL Brooke, Deputy Post Commander, and gave Mr. Daniel, Post Safety Dir/RPO, a tour of the areas. SSG Truffa called LBG Army Depot and explained TS784 wipes would be late and got film results to hot cell environmental checks. Results indicate roof area of Hot Cell should be marked "Radiation Area."

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE  
Supplementary Sheet

License Number 01-02861-01

Amendment No. 22

Department of the Army  
U. S. Army Chemical Center  
and School  
Radiological Division  
Technical Department  
Fort McClellan, Alabama 36205

License Number 01-02861-01 is hereby terminated.

RECORDED  
EX-103  
JUL 26 1973  
DIVISIONS

For the U. S. Atomic Energy Commission

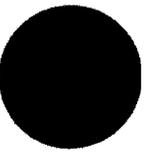
Original Signed By  
Robert E. Brinkman

by Robert E. Brinkman

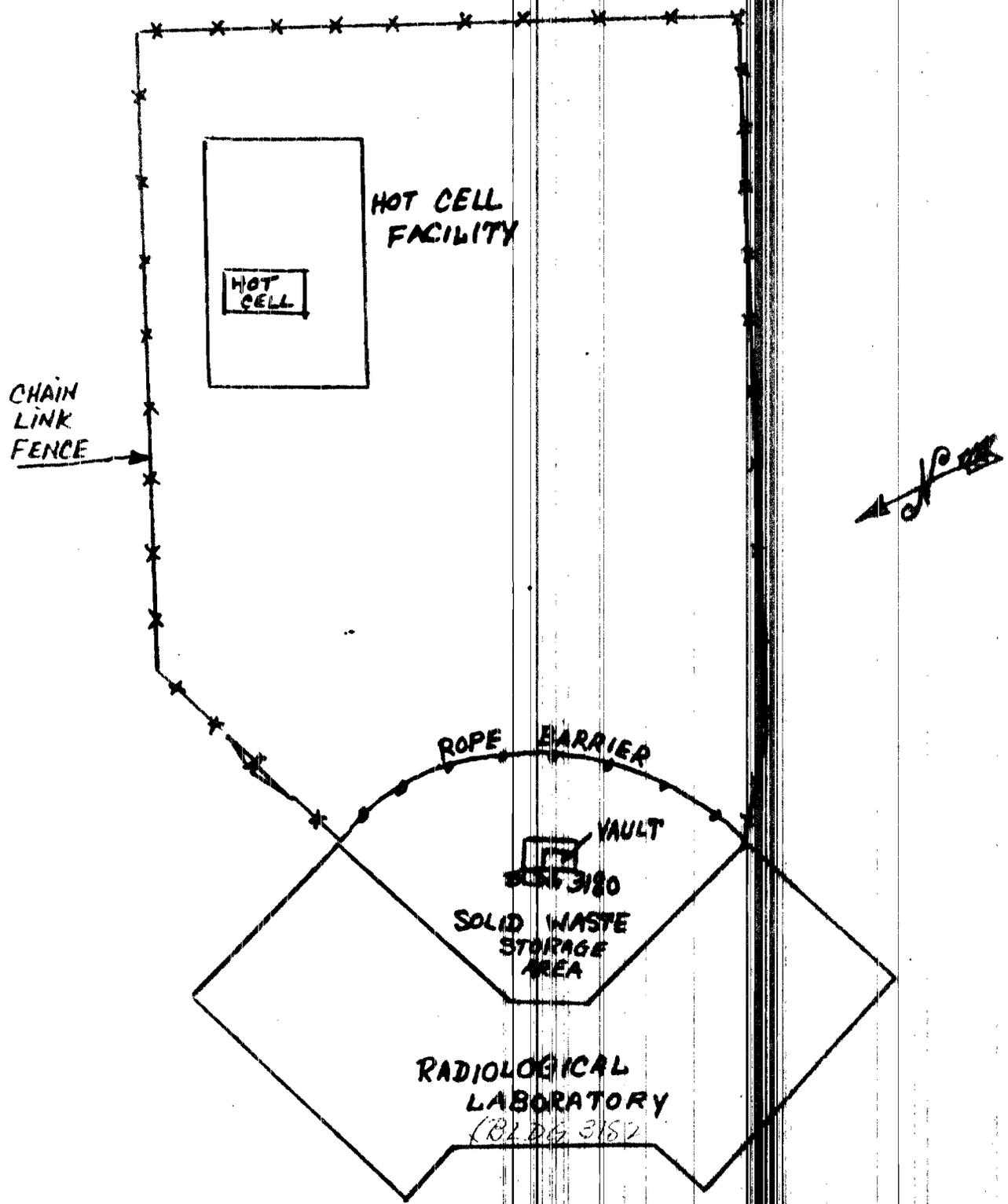
Directorate of Licensing  
Washington, D. C. 20545

Date JUL 26 1973

4



Handwritten notes at the top of the page, including the word "LABORATORY" and other illegible scribbles.



LOG/E2

15 MAY 1964

U. S. Atomic Energy Commission  
Division of Licensing and Regulations  
Isotopes Branch  
Washington, D. C. 20545

Gentlemen:

Recommend approval of the attached application for amendment to  
Byproduct Material License No. 1-2861-1 for U. S. Army Chemical Center  
and School, Fort McClellan, Alabama.

Sincerely yours,

Signed

JESSE R. CHEATHAM  
Colonel, GS  
Chief, PEMA Execution Division

1 Incl  
as



59868

U. S. ARMY CHEMICAL CENTER & SCHOOL  
Fort McClellan, Alabama 36205

6 APR 1964

AJMCL-V

SUBJECT: Byproduct Material License 1-2861-1

THRU: ~~Commanding General~~ R. F. T.  
~~U. S. Continental Army Command~~  
~~Fort Monroe, Virginia~~ 13 APR 1964

THRU: Deputy Chief of Staff for Logistics  
Department of the Army 14 APR 1964  
ATTN: Chief PEMA Execution Division  
Washington, D. C.

TO: Chairman  
United States Atomic Energy Commission  
ATTN: Isotopes Division  
Washington, D. C.



1. References:

- a. AEC Byproduct Material License Number 1-2861-1 with nine amendments.
- b. Title 10, Code of Federal Regulations, Part 30.
- c. AR 700-52, Licensing and Control of Radioactive Materials.

2. Request Byproduct Material License Number 1-2861-1 be amended as indicated below. Form AEC-313(5-58) is attached in accordance with Title 10, Code of Federal Regulations, Part 30.36. (See Inclosure 1.)

59868

AJMCL-V

6 APR 1964

SUBJECT: Byproduct Material License 1-2861-1

a. Fabrication of sealed sources by Licensee.

(1) The referenced AEC license authorizes the School to obtain 750 Cobalt-60 sealed sources by contract from Gamma Industries, Inc., and to fabricate 250 Cobalt-60 sources using 5230 curies of metallic Cobalt which was on hand at the School.

(2) Based on experience gained since the application for the latest amendment, it is now desired to purchase an additional 270 Cobalt-60 sealed sources on contract and not fabricate any sources locally. A total of 1020 sources would be obtained on contract. Of these, 1,000 are intended to be installed in the new radiological field and 20 would be stored in the 8,000 curie Hot Cell of the School as spares to replace any of the installed sources which become leakers.

(3) A contract for the additional 270 sources is now under negotiation with the same technical specifications used in the Gamma Industries' contract. The desired delivery date for the additional 270 sources is September 1964.

(4) The 5230 curies of Cobalt which was to have been used to locally fabricate sealed sources was disposed of in January 1964 using procedures specified in Army Regulations 755-380.

b. Labeling of sealed sources.

(1) The correspondence supporting the present license specifies that a brass tag will be affixed to each capsule containing the information indicated in Condition 16 of Amendment 9. No satisfactory method has been developed to attach the brass tag to the stainless steel capsule, all attempts to weld, solder or cement the tag to the capsule having failed.

(2) Radiation resistant decals produced by Minnesota Mining and Manufacturing Company were purchased by Gamma Industries to be used in place of the brass tags. Sample decals attached to steel capsules were tested by exposure to  $10^{10}$  rads, temperature of 160°F for three days, temperature of 32°F for two days, and soaked in water for five days. At the end of the tests the decals were still firmly attached to the capsules and legible.

6 APR 1964

AJMCL-V

SUBJECT: Byproduct Material License 1-2861-1

(3) It is requested that the requirement for a brass tag be deleted. Authority to use a radiation resistant decal with magenta lettering on yellow background affixed to each capsule is requested. The serial number of each capsule will be stamped on the end of the capsule with the decal placed close to the same end as shown in attached photograph. (See Inclosure 2.)

FOR THE COMMANDANT:

2 Incl  
as

G. H. ROBERTS  
Lt Colonel, CmIC  
Secretary

JUN 16 1964

DL:IB:NB(39855)

Commanding Officer  
U. S. Army Chemical Center and School  
Fort McClellan, Alabama

Gentlemen:

This refers to your application dated April 6, 1964,  
for amendment to License Number 1-2851-1.

In order to proceed with review of the application,  
we need the following information:

1. The manufacturer and model number of the  
Cobalt 60 source which will be in the  
Model AN/UM-1 Calibrator.
2. To whom the 3230 curies of Cobalt 60 was  
transferred for disposal.

Upon receipt of the above information, in duplicate,  
we shall continue review of the application.

Sincerely yours,

Nathan Rassin  
Isotopes Branch  
Division of Materials  
Licensing

cc: Compliance Region II

DL:IB

NRassin

6/12/64

U. S. ARMY CHEMICAL CENTER & SCHOOL  
Fort McClellan, Alabama

JUN 24 1964

AIRTEL

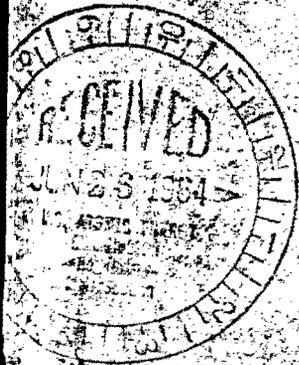
Director  
United States Atomic Energy Commission  
ATTN: Mr. Nathan Bassin, Isotopes Branch,  
Division of Materials Licensing  
Washington, D.C. 20545

Dear Sir:

In reply to your letter, file number MA:IB:NB (59868), dated 16 June 1964, the following information is furnished:

a. Model AM/UHM-1 Calibrator Set #70 with a 7.8 curie cobalt-60 source (as of 23 June 1953) was manufactured for the Navy Department - Bureau of Ships, by the National Electric Shops, Inc., Silver Springs, Maryland, under contract number 22466. This set has been in use at the U. S. Army Chemical School for instrument and film calibration since 1953 and its cobalt-60 carriage accounted for in previous licenses in the overall permissible amount authorized for sealed sources.

b. The 5230 curies of cobalt-60 (as of June 1962) was disposed of as radioactive waste in accordance with paragraph 15, Army Regulation 755-380. Technical support personnel provided by the Commanding General, Edgewood Arsenal, Maryland, transferred the material from this station to the ground burial facility of Nuclear Engineering Company, Morehead, Kentucky, on 20 January 1964.



AMCL-V  
Director, United States Atomic Energy Commission

Please inform us if further information is desired.

Sincerely yours,

EDWARD J. ODACHOWSKI  
Lt Colonel, GAI  
Assistant Secretary

Three (3) Copies Furnished:  
DCHLOG through Command Channels



UNITED STATES GOVERNMENT

# Memorandum

TO : Files, Region II  
Division of Compliance

DATE: July 2, 1963

FROM : *JSA* *wyp*  
Sutherland and Peery

SUBJECT: DEPARTMENT OF THE ARMY, U. S. ARMY CHEMICAL CORPS SCHOOL, FT.  
McCLELLAN, ALABAMA, LICENSE NO. 1-2861-1

CO:II:JTS:WWP

At 10:00 P.M. on July 1, 1963, we received a telephone call from G. Giboney, SROO. Giboney stated that at 9:00 P.M. he received a call from a man in Anniston, Alabama. The man would not give his name but stated that there was a contamination problem resulting from leaking sources at the Army Chemical Corps School. He stated that test samples had been sent to a Dr. Augustine at U. S. Public Health laboratory in Montgomery, Alabama, and that a laboratory at the Chemical Corps School had been shut down. Giboney stated that of his own knowledge he knows that the Chemical Corps School has both radium sources and cobalt-60 sources and that he was turning the matter over to Region II, Division of Compliance.

On July 2, 1963, W. W. Peery talked with Col. I. D. Webber, Commandant, concerning the reported contamination of the laboratory at the school. Col. Webber stated that Major J. B. Speer, RSO, had informed him that there was no real problem with the contamination. Col. Webber stated that he thinks the contamination was confined to one room and that perhaps two civilian employees have been involved.

Conversation with Major Speer - He stated that he had not considered the contamination a problem that required reporting to us. He stated that they had changed their method of taking swipes and that now rather than dry swipes, wet swipes are used and that this change in the method of contamination surveying had shown evidence of cesium-137 contamination. He stated that this cesium was received some years ago, approximately 1956 or 1957, from Nevada for the purpose of encapsulation in sources but sealing of the sources had been unsuccessful. He stated that this effort was discontinued and the cesium kept for a while and then disposed of. However, in the meantime apparently some of the cesium crept about the laboratory. The maximum level seen on the smears, as counted with a thin window

July 2, 1963

GM tube, was 150 c/m or 300 to 500 d/m. Major Speer stated that the cesium-137 had been definitely identified and that also small amounts of cobalt-60 were also included in the count noted on the smears. He stated that there is an encapsulation facility in one corner of the laboratory and that some cobalt-60 is stored in a vault in this area. He stated that they are in the process of collecting any excess materials in this vault, including the cobalt-60, preparatory to disposal of the material and the construction of a new facility approximately one year hence. Major Speer stated that the laboratory is not shut down and that personnel are entering the laboratory now just for the purpose of clean-up. He stated that radiation survey instrument readings in the laboratory are in the range of 0.5 to 1.5 mr/hr with some readings in the close proximity of stored materials up to 2 mr/hr. The laboratory is considered a restricted area. Major Speer stated that personnel working in this laboratory are monitored with film badges and that the film readings have shown no problem in staying well within the limits of 10 CFR 20. Major Speer stated that two civilian employees, Mr. J. Hail and Mr. R. Moore, have worked routinely in this laboratory for some years. He stated that both men have submitted 72-hour samples for urinalysis to the 3rd Army, Ft. McPherson, Atlanta, Georgia. He stated that he will furnish copies of the results of the urinalyses to us. Major Speer was informed that we ~~would~~ <sup>probably</sup> not make a visit concerning this matter at the present time, since the licensed program involving this material is due for reinspection, ~~and that we would~~ <sup>we will</sup> cover this matter in more detail at that time.

November 16, 1956

J. W. Hitch and J. N. Maddox

VISIT TO U. S. ARMY CHEMICAL CORPS SCHOOL, FORT McLELLAN, ALABAMA

SYMBOL: DEB:JWH

Persons Visited: Lt. Col. Charles Brice, Jr., Chief of Technical Division and Lt. William G. Powell, Radiological Safety Officer.

Other Persons Visited Included: Major Daniel K. Kalish, 2nd Lt. James M. Williams and 2nd Lt. Robert F. Smith who is assistant radiological safety officer. Col. C. H. Wood is chairman of the radioisotopes Committee; however, he was unable to be present on the date of our visit.

Other Members of the Isotope Committee are as follows:

Col. Joseph M. Cameron  
Major John B. Beach

License: This institution has not had a license. They have been operating under a General Authorization with an unlimited procurement limit. The authorization expires on December 31, 1956.

Field Representatives: J. W. Hitch, John N. Maddox.

Accompanied by: C. H. Giboney, Savannah River Operations Office.

Date of Visit: Pre-opening visit on November 9, 1956.

I. Administrative Control

The administrative control of the program at this institution appears to be satisfactory with the exception of rather high exposures to several personnel during the encapsulation of some radioisotopes. Standard operating procedures, as published in April, 1953, are presently being revised. From an administrative standpoint, the SOP, as outlined, appears to be reasonably satisfactory. However, the radiation symbol used at this institution does not comply with that as noted in Part 20 of our proposed Code of Federal Regulations.

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November 16, 1956

The program at this installation is that of training soldiers in fall-out surveys, and it is necessary that these people receive some exposures to radiation. However, for the most part, it is unnecessary that they receive levels close to the 300 mR/wk MPE value. The high exposures to Lt. Powell and Sgt. Courtwright indicated that Lt. Powell had insufficient understanding of the radiation hazards. He indicated that some of their people wished to come to Oak Ridge for further training in radiation safety. He indicated that he had contact with Dr. Anderson, ORNL, regarding training of other individuals and also the possibility of obtaining personnel already trained. Lt. Powell has had the health physics course at ORNL, but it was doubtful that he was putting into practice the precepts which such a course normally establishes.

#### II. Procurement Control

Procurement of radioisotopes at this institution appeared to be well coordinated, although they had obtained some rather large amounts of radiocobalt under their present authorization. They indicated that they might obtain more, although they had approximately 400 curies in storage at the time of our visit.

#### III. Material on Hand

During the past year, this institution received 1 unit of Mercury 203, 718 curies of Cobalt and 2710 curies of Cobalt in another shipment. At the time of our visit, 3750 curies of Cobalt was in storage on the Rad Survey Area No. 3. These sources were stored underground in devices which can be operated by a long string to bring the source above the surface. The size of these sources vary in magnitude from less than 100 millicuries to several hundred millicurie units. The area is well fenced, although we did not have a chance to visit it - it being several miles from the main school and accessible only by jeep or by foot. Other Cobalt stored was 450 curies, mostly stored underground in a water bath.

#### IV. Disposal of Radioisotopes

It was learned that Ft. McClellan has set aside a field for the disposal of radioactive waste. Most of this waste is contaminated equipment, although we did not see this disposal area. It was reported to have been enclosed and secured against unauthorized entry. It was reported also that the field was posted to assist in controlling entry to the area. The area was selected because of its topographical qualifications and the low possibility of radioactive materials migrating into drinking water supplies. All waste is buried at a depth not less than 10 feet below the surface.

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It was pointed out to Lt. Powell that burial ground should first be approved by the AEC prior to use. However, it appeared, from his description, they had observed the precautionary measures which we would normally require.

#### V. Facilities and Equipment

There were several rooms set aside for calibration of instruments; this being a part of the course of instruction. Trainees may work in a field approximately 40 mr/hr over short periods. Normal exposures to personnel over the entire course is not proven to be greater than 3 or 400 mr. The facility used for encapsulation had been disassembled. We were assured that new facilities were to be constructed prior to further encapsulation. A pair of slave manipulators from Central Scientific Company has already been delivered for use in this proposed hot cell. A small room, approximately 10 foot square, was constructed in a fenced off area in the rear of the training building. This room had walls of approximately 10 inches of concrete and had stored within a variety of small sources of radiocobalt which could be used in the radiation survey area. In addition, there were 3 large storage containers, approximately 28 inches in diameter which could be used for storage. These containers were steel jacketed and lead filled and had been obtained from Dugway Proving Ground. In addition, a water well at one corner of this building was used for storage of approximately 400 curies of Cobalt. Storage of Cobalt and facilities for future storage appeared to be entirely adequate.

#### VI. Ventilation

One of the laboratories was equipped with a very nice fume hood; however, it appeared to have had very little use up to the present time. All laboratory floors were covered with mosaic tile and kept well polished. Work areas and surfaces were in first-class condition.

#### VII. Shielding

The only shielding which we were able to review was that used for storage and was entirely adequate for this purpose. The hot cell already used has been disassembled with a new one to be constructed.

#### VIII. Equipment

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The equipment, as used in the past, for source encapsulation, was not reviewed because of its disassembly. Neither was complete equipment set up for future encapsulation. The remote slave manipulators should be a great boon in design of the hot cell for keeping exposures to personnel low.

## IX. Instrumentation

A great variety of instruments were available for radiation survey purposes, including the AN/PDR-27A and C. These instruments have a range of 500 mr/hr. They also have small calibration sources of approximately 5 microcuries of Cobalt. Also, available was a scintillation type AN/PDR-13A and B. These instruments also had a calibration source of 100 microcuries of Strontium 90. For personnel monitoring, both dosimeters low and high range and film badges are used. Film badge processing is carried out under the supervision of Lt. Powell. An Aneco-MacBeth densitometer is used for density measurements and approximately 25 films are used as standards in establishing density versus radiation curves. A brief review of their film badge interpretation program indicated that they were taking the necessary steps to obtain appropriate readings. It was also learned that their film badge and high range dosimeter readings were in reasonably close agreement.

## X. Precautionary Procedures

All personnel are monitored with film badges and a low range and high range dosimeter. Blood counts are also kept on various personnel. Although monitoring devices are used routinely, several high exposures have occurred at this installation. It would appear that these exposures were due to two causes: Lack of proper precautionary measures in handling techniques and poor facilities for encapsulation. For instance, Lt. Powell had received cumulative doses of approximately 12 r since his arrival there in early 1955. High to weekly doses to Lt. Powell were as much as 2870 and 1620. These doses occurred on consecutive monitoring periods. Other high level doses were 642 and 598 mr per 2-weeks' period. A Sgt. Courtwright had received in a period of a year's time, better than 7 r. It was pointed out to both Col. Brice and Lt. Powell that these exposures levels were much higher than the AEC will permit under routine licensing, and that we would like very much to encourage them to take appropriate steps to correct subsequent exposures of this magnitude and that certainly exposures greater than 300 mr/wk should be of a non-routine nature and that individuals who have already obtained such high exposures be delegated to duties requiring little, if any, subsequent exposure until the over-all level of radiation could be brought to permissible averages. The 5 r per year, as recommended by the National Research Council, was discussed at some length and they were told that it may possibly be included in radiation protection standards that the AEC would adopt.

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**XI. Controlled Areas**

All radiation at this institution is handled in controlled areas and for routine operations. Exposures to personnel are not excessive.

**XII. Records**

Personnel monitoring records were kept with cards set up for each individual, showing not only their periodic exposures, but their cumulative exposures during the entire time the trainee was on that post. This was true for trainees, as well as instructors and other personnel involved in the program. Records of receipt of material were also adequate.

**XIII. Compliance with Regulations**

Procurement of radioisotopes was in accord with limitations as provided for in their authorization. Material was located and used in such a way that individuals should not be overly exposed. However, there was certain nonroutine operations which we felt to offer unnecessarily high exposures to a few isolated personnel which has been discussed in more detail above.

**XIV. Compliance with Conditions of License**

As noted above, this institution does not yet have a license, and therefore, their program has not been tied to Part 20. They do have written procedures and the only exceptions are overexposures to personnel and the improper posting of radiation areas - using a symbol all their own. (See front page of SOP)

**XV. Hazardous Conditions**

The encapsulation of Cobalt at this institution in the past has offered considerable hazard to individuals. The facility has been dismantled and new facilities are to be constructed. It is hoped that with the new/facilities for the encapsulation of radioisotopes, exposure to personnel will be greatly minimized. Col. Brice assured us that they would abide by AEC recommendations in the future.

**XVI. Summary**

The program at this institution is that of radiological warfare training of personnel. They expect to have in their possession approximately 600Curies of Cobalt and various other isotopes

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Army Chem. Corps School  
Ft. McClellan, Ala.

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November 16, 1956

but of much lesser magnitude. They have carried out encapsulation of Cobalt for radiological warfare studies and have had rather high exposures in several instances. Old facility for encapsulation has been disassembled and a new one proposed. It was recommended that they construct facilities which would minimize personnel exposures and that their sealing techniques be comparable to that used at ORNL. Lt. Powell stated that he planned to come to Oak Ridge both to review their new application for a license and sealing techniques at ORNL.

Rec: D. H. ...  
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Records of Exposures of Permanent Party  
U. S. Army Chemical Corps School  
Fort McClellan, Alabama

The following indicates the cumulative exposures fro members of the permanent party of the U. S. Army Chemical Corps School. Current column shows exposures for third quarter of 1961 up to the date of the inspection.

<u>Name</u>	<u>Exposure (Rem) Current</u>	<u>Exposure (Rem) Apr 3 - Jul 3</u>	<u>Exposure (Rem) Jan - Mar</u>	<u>History (Rem)</u>
K. H. Hall	0	.057	0	6.797
R. G. Moore	.220	.428	.442	20.095
L. L. Dole	0	.110	.161	1.197
A. L. Braum	0	.035	.178	0
D. F. Wyatt	-	0	0	.117
E. N. Self	.112	-	-	0
G. L. Gallier	.530	.206	.143	11.351
C. F. Lear	0	0	0	.123
R. G. Harris	-	-	-	.146
C. H. Stagner	0	0	.127	.325
A. Levine	.71	.85	0	4.922
C. H. Colgin	0	.40	0	2.550
J. E. Baxley	0	0	.99	.185
W. S. Rosing, Jr.	0	.67	.124	.667
C. W. Roberts	0	.93	.191	.396
B. G. Smith	.22	.235	-	.118
K. A. Genoni	0	.56	.81	.133
E. O. Jones	0	0	.42	
B. H. Lee	-	0	.33	.088
D. A. Burge	-	0	.38	1.165
*E. W. Kelley	5.022	.140	.38	7.500
*P. W. LaVie	5.100	.066	0	6.382

A Form AEC 4 and Form AEC 5 is maintained for each member of the permanent party.

\*A letter of August 15, 1961 from U. S. Army Chemical Corps Radiological Unit, Dugway, Utah, reported the following exposures:

	<u>Beta</u>	<u>Gamma</u>	<u>Total</u>
Sgt. E9 P. W. LaVie July 26, 1961	3825	1275	5100
Sgt. E. W. Kelly August 2, 1961	3530	1470	5000

The beta exposure is recorded as a skin exposure; the gamma exposure is recorded as a whole body exposure.

These individuals were exposed at the SL-1 reactor incident site while on temporary duty.

*FOR NOTES OF 7/5-8/61  
INSPECTION SEE*

EXHIBIT F

*1-2861-1 FOLDER*

L. D. Low, Director, Division of  
Compliance, Headquarters

November 9, 1961

J. G. Davis, Acting Director, Savannah River  
Compliance Area, Division of Compliance

INSPECTION REPORT - U. S. ARMY CHEMICAL CORPS SCHOOL, FT. MOULDER, ALABAMA (LICENSES NO. 1-2861-1 AND SSM-344)

CO-OR:JGD:esh

Enclosed is an inspection report of the subject licenses revealing 15 items of noncompliance. The most significant items of non-compliance noted were the failure to report in 1958 a spill of Strontium-90 which apparently was an incident and the possession of unknown quantities of unknown radioisotopes emitting significant quantities of ionizing radiation.

The improvement of this program since last visited by the same ABC representative in January 1960 is noteworthy. This improvement apparently can be attributed to the present radiation safety officer. This individual has made a sincere effort, with no little success, for more effective control of this program. The program has a strong, active radioisotope committee. However, the policies of the committee and the day-to-day functioning of the safety program rests on the radiological safety officer. Unfortunately, as a military installation the position of radiation safety officer is filled by military assignment which normally is subject to rotation each two years. Consequently, the radiation safety program of this license lacks continuity and varies with the personality occupying the position of radiation safety officer. Due to the size of this program and to the potential hazard, it would be advantageous if a continuity of the safety program could be established. The system which would assure more continuity would be the establishment of the position of radiation safety officer as a permanent position not subject to rotating military assignment. It should be noted that the more significant items of noncompliance occurred prior to the assignment of the present individual as radiation safety officer. These items are a matter of record.

With regard to the spill of Strontium-90 in the enclosed regulated area next to the radioisotope storage vault, according to the present radiation safety officer, Colonel G. H. Colgin, this spill occurred in December 1958 prior to the assignment of Colonel Colgin as the radiation safety officer. No records exist to establish the facts of this spill. This spill occurred in an enclosed restricted area and, according to Colonel Colgin, involved the spilling of a liquid containing Strontium-90. Due to the fact that no records

See ENFORCEMENT  
L.R. DLR to Licensee  
dated 6/14/62  
and license reply  
dated 7/6/62  
in folder  
1-2861-1

No enforcement  
action ok this  
inspection - See  
memo 6/8/62  
Pace to Dubinski  
in same folder

exist of this spill and due to the fact that the Federal Regulations establish no limits for surface contamination, it is difficult to establish noncompliance with a specific paragraph of 10 CFR 20.403 (prior to January 1, 1961). A citation is recommended against 10 CFR 20.403 on the basis that there probably was a loss of more than one day of the utilization of this facility. A citation also is recommended against 10 CFR 20.401 for failure to maintain survey records of facts and evaluations of this occurrence.

This licensee possesses unknown quantities of unknown radionuclides, which emanate significant quantities of radiation. These quantities are an artillery projectile reading, according to Colonel Golgin, 17,000 mr/hr with the meter in contact with the projectile; a 5-ton storage container which, with the top partially opened, reads 500 mr/hr at 12 inches; and a storage well approximately 5 to 8 feet deep which reads 5000 mr/hr at the surface of the water. This well is capped with lead which reduces the radiation level to 3 mr/hr. In addition to these quantities of unknown radionuclides, the licensee possesses 417 sources of Cobalt-60 of unknown exact quantity or form installed as sealed sources in a field exercise area known as Pelham Range. The licensee does not know the form or quantity but believes the sources to be metal slugs ranging from 5 curies to 40 curies when installed in 1955-'56. For these unknown radionuclides and unknown quantities, Colonel Golgin has communicated with previous radiation safety officers in an attempt for identifications. No positive information has been determined. Under the present methods of handling and storage, these radionuclides constitute no undue hazard. The licensee intends to identify and utilize or dispose of these radionuclides once he begins utilization of a hot cell presently constructed but not yet accepted from the constructing contractor by the licensee. It is suggested that the Division of Licensing and Regulation may desire specific procedures for the handling of each of these unknown items.

The licensee states that he possesses 100 microcurie Strontium-90 internal calibration sources for the AN/VR 18A instruments under the provisions of a license held by the Department of the Army, Lexington, Signal Depot, Lexington, Kentucky. Contacts with the Oak Ridge Compliance Area Office and with Mr. Chester Hunt of the Division of Licensing and Regulation disclose that the Lexington Signal Depot is not licensed to provide for such possession at Ft. Meade. The license of the U. S. Army Chemical Corps School, Ft. Monmouth is sufficient to provide for the possession of these internal calibration sources. These sources have not been leak tested. According to the licensee they have been possessed by him since 1954. The licensee does possess and is authorized to possess under the Lexington Signal Depot license, Strontium-90 sources of approximately 30 millicuries for use in a TR-704 calibrator. Some other license issued to the Department of the Army may provide for the possession of the 100 millicurie Strontium-90 sources.

In addition to the instrument calibration sources, the licensee possesses two M3 kits containing Cobalt-60 sources. He states this item is an item of issue by the Chief, Army Chemical Corps and probably is possessed under the license of the U. S. Army Chemical Corps Center, Edgewood Arsenal, Maryland. Information obtained from Mr. Kwast indicates that the license of the Chemical Corps Center does not provide for an M3 kit. The license of the U. S. Army Chemical Corps School, Ft. McClellan, Alabama is sufficient to provide for the possession of the Cobalt-60 sources. Some other license issued to the Department of the Army may provide for the possession of the Cobalt-60 sources by units other than that specifically licensed.

This report recommends citation of this licensee for failure to leak test these Strontium-90 and Cobalt-60 sources. However, due to the Army-wide distribution of these sources such a citation may have implications not immediately apparent. Such a citation may imply that leak testing is to be performed by the unit holding the sources. Some holding units may not possess the experience or equipment necessary to perform such tests. It is suggested that this situation of an Army unit possessing sources under a license other than a license issued to the specific holding unit be examined on an Army-wide basis. A separate memorandum of this date entitled "Possession of Licensed Material by Units of the Department of the Army" deals with this matter.

The licensee possesses survey instrumentation which have internal calibration sources. These meters, in some instances, are not labeled per 10 CFR 20.203(f)(4). No citation is recommended since the meters are not exclusively storage containers.

The items of noncompliance were discussed with Colonel Laverne A. Parks, Commandant, Army Chemical Corps School; Colonel I. B. Webber, Committee Chairman; Lt. Colonel R. G. Harris, Deputy Chairman, and Lt. Colonel C. W. Colgin, Radiological Safety Officer, At the conclusion of the inspection. Colonel Parks stated that action would be taken to correct the items of noncompliance other than the leak testing of the Strontium-90 and Cobalt-60 sources held under licenses other than those issued to the Chemical Corps School.

Correspondence with regard to this inspection should be directed to the Commandant, U. S. Army Chemical Corps School, Ft. McClellan, Alabama.

This office plans no follow-up inspection.

## COMPLIANCE INSPECTION REPORT

1. Name and address of licensee  Department of the Army U. S. Army Chemical Corps School Ft. McClellan, Alabama	2. Date of inspection  September 5-8, 1961
	3. Type of inspection  Reinspection
	4. 10 CFR Part(s) applicable  Parts 20, 30, and 70

5. License number(s), issue and expiration dates, scope and conditions (including amendments)

1-2861-1 - October 21, 1957 - October 31, 1958

Amendments

- No. 1 - January 20, 1958  
 2 - December 2, 1958 - November 30, 1960  
 3 - September 24, 1959  
 4 - February 9, 1960  
 5 - August 12, 1960  
 6 - April 11, 1961 - April 30, 1963

NM-344 - January 4, 1960 - December 31, 1962 *Tested*Amendments

- No. 1 - September 21, 1960 - December 31, 1962  
 2 - June 22, 1961 - June 30, 1964

6. Inspection findings (and items of noncompliance)

The licensee conducts an adequately controlled program for student instruction in radiological warfare. Control is exercised through a Health-Physics staff operating under an active Isotopes Committee. The committee is directly responsible to the licensee commandant for the safety of the radioisotope program. Detailed radiological safety procedures have been written and distributed to users. Personnel monitoring devices and adequate survey instrumentation are provided. According to the licensee, certain radioisotopes are possessed under licenses other than those issued to this licensee. The licensee performs surveys on a routine frequency. Records are maintained of receipts; inventory, and disposal; surveys; film badge assignments; film badge results; and committee actions.

The only items of noncompliance observed or otherwise noted during this inspection are:

License No. 1-2861-1

License Condition 16 - Except for Cobalt-60 sealed sources installed in the Radiological Training Area, Pelham Range, the following condition is applicable:

- A. Each sealed source acquired from another person and containing byproduct material with a half-life greater than 30 days and in any form other than gas, shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within 6 months prior to the transfer, the sealed source shall not be put into use until tested. (Con't. back)

7. Date of last previous inspection 3/28-29/61	8. Is "Company Confidential" information contained in this report? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> on back (Specify page(s) and paragraph(s))
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DISTRIBUTION:

Original & Copy - L. D. Low  
Copy - SR Compliance Area

J. G. Davis  
 (Inspector)  
 Approved by: *J. G. Davis*  
 J. G. Davis, Acting Director  
 SR Compliance Area  
 (Operations office)

November 9, 1961

(Date report prepared)

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to head format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form under appropriate item.

Department of the Army  
U. S. Army Chemical Corps School  
Fort McClellan, Alabama

Licenses No. 1-2861-1 &  
SNM-344

### Details

#### 9. History

This inspection constitutes the initial inspection for License No. SNM-344.

The byproduct material program of the licensee is conducted under License No. 1-2861-1. This program was initially licensed on October 21, 1957. Prior to that date, radioactive material had been procured by the Army Chemical Corps School under the Atomic Energy Commission's authorization procedures. By a memorandum dated 2/13/58, the Chemical Corps School notified the Oak Ridge Operations Office of a Type C incident. This incident involved the overexposure of three individuals with reported exposures ranging from 1170 mr to 1880 mr - exposures that occurred during transportation of radioactive material. The licensee limited further exposure to these individuals during the 13 consecutive week quarter. A report of this incident dated March 17, 1958, was made to Headquarters by Savannah River. Savannah River did not perform a direct investigation of this incident. A letter of February 25, 1958, from the Division of Licensing and Regulation, informed the licensee of receipt of his report.

On October 29, 1959, Savannah River received a report of a Type C incident from the licensee involving student personnel. These exposures range from 580 mr to 2400 mr. The exposure of 580 mr was to an individual below 18 years of age. This exposure had occurred on October 5, 1959, in a field radiation exercise. A report of this incident was transmitted by Savannah River to Headquarters on February 4, 1960.

On January 29, 1960, Savannah River received a report of a Type C incident at the licensee's facility involving a single individual who received a reported 2200 mr exposure. This exposure had previously been noted during an inspection of this licensee on January 7-8, 1960. The individual involved in the exposure reported on January 29, 1960, was a member of the permanent party of Ft. McClellan and had participated in the same field exercise causing the overexposures of October 5, 1959. The report of investigation of this 2200 mrem exposure was submitted by Savannah River to Headquarters on February 16, 1960.

On January 29, 1960, Savannah River received a report of an additional Type C incident by the licensee involving the overexposure of two individuals. These overexposures amounted to 945 millirem and 1350 millirem. These exposures occurred on November 2, 1959, during the conduct of an inventory and maintenance operation at the licensee's radiation field exercise area. A report of the investigation of this incident was transmitted by Savannah River to Headquarters on March 17, 1960.

On July 27, 1960, the licensee reported to Savannah River, the overexposure of 5 individuals involved in two separate incidents at the licensee's facilities. One of these incidents resulted in the overexposure of one individual who had a reported exposure of 1880 mrem. This overexposure occurred during July 8-9, 1960, while the individual involved was participating in the lowering of Cobalt-60 sources on the licensee's field radiation exercise facility. The other four overexposures ranged from 970 mrem to 1770 mrem. The licensee reported that these exposures occurred during the period 6/15 - 7/15/60. These four individuals involved were engaged in moving Cobalt-60 sources from a storage area to the field radiation exercise area. A report of an investigation of these two incidents was forwarded to Headquarters by Savannah River on September 19, 1960.

This licensee was initially inspected on March 16, 1959. As a result of this initial inspection, citations were recommended under 10 CFR 20.203(b) for improper posting of an area in which radioactive material was stored; License Condition 8 - in that the licensee had on hand material in excess of possession limits; License Condition 14 - in that the licensee did not have leak test records available; and, License Condition 15 - in that a sealed source was not tagged as required. These citations were transmitted to the licensee by letter of November 12, 1959, from the Division of Licensing and Regulation. The licensee was requested to reply within 30 days as to action taken to correct these deficiencies. By memorandum dated November 24, 1959, the licensee indicated the corrective action taken. A letter of December 18, 1959, from the Division of Licensing and Regulation acknowledged receipt of the licensee's memorandum of November 24, 1959.

On January 7-8, 1960, this byproduct material program was reinspected. This report recommended citation of the licensee against 10 CFR 20.403(c) for failure to submit a report of a Type C incident. The Division of Licensing and Regulation did not communicate with the licensee regarding this re-inspection.

On July 13-14, 1960, a second reinspection of this program was conducted. This reinspection recommended citation under License Condition 14 for failure to leak test a Cesium-137 source. The Division of Licensing and Regulation did not communicate with the licensee with regard to this reinspection.

A memorandum of September 21, 1960, from L. R. Rogers to L. D. Low stated that the Division of Licensing and Regulation would not take enforcement action on the inspection of July 1960 and investigation reports related to overexposures until the program review had been completed by AEC representatives and the Surgeon General's representatives. On March 28-29, 1961, the third reinspection of this program was conducted. This inspection recommended no items of noncompliance.

A memorandum dated May 24, 1961, from E. R. Price, Division of Licensing and Regulation, to L. D. Low, Division of Compliance stated that as a result of visits to the licensee's facility, by the Department of the Army personnel and Division of Licensing and Regulation personnel and as a result of no items of noncompliance being recommended by the March 28-29, 1961, inspection, the Division of Licensing and Regulation as of the date of the memorandum contemplated no further enforcement action against the licensee.

#### 10. Organization

The U. S. Army Chemical Corps School is one of two major components of the Chemical Training Command located at Ft. McClellan, Alabama. The Chemical Training Command is a brigade-size unit. Within this command are the 100th Chemical Group which is a regimental-size unit composed of tactical chemical units. The 100th Group furnishes to the Army Chemical Corps School individuals for the conduct of courses within the Chemical Corps School. These individuals were referred to as "bodies" by the Radiological Safety Officer. He indicated that these individuals do not possess specialized training in teaching techniques. However, they are available for use by the Chemical Corps School under the direct supervision of individuals possessing specialized training. The use of these individuals, according to the Radiological Safety Officer, generally consists of service as drivers for field exercises and for assistance for maintenance and leak test operations on Pelham Range. The second major component of the Chemical Training Command at Fort McClellan is the licensee, the U. S. Army Chemical Corps School. The Commandant of the Chemical Corps School is Colonel L. A. Parks. The Assistant Commandant, who by position serves as the radioisotopes committee chairman, is Colonel Ira B. Webber. The use of the radioisotopes by this licensee is accomplished within the Technical Division of the Army Chemical Corps School. The Chief of this Technical Division is Lieutenant Colonel Rhett G. Harris. This Technical Division is composed of five branches - the Chemical Branch; the Biological Branch; the Radiological Branch, Chemical, Biological and Radiological (CBR) Defense and Material Branch; and, Health Physics Branch. All radioactive material used by the licensee is within the Radiological Branch whose Chief is Lieutenant Colonel George Kontra and the Health Physics Branch whose

Chief is Lieutenant Colonel Clarence H. Colgin. In addition to being Branch Chief of the Health Physics Branch, Colonel Colgin also serves as the Radiological Safety Officer for the licensee.

The byproduct material program of the licensee is under the direction of the Isotopes Committee of the U. S. Army Chemical Corps School. The Chairman of this committee is the Assistant Commandant, Colonel Ira D. Webber. Current committee membership consists of the following:

Colonel I. D. Webber, Assistant Commandant of the School, Chairman  
Lieutenant Colonel R. G. Harris, Chief, Technical Division, Deputy Chairman  
Lieutenant Colonel C. H. Colgin, Member, Recorder and Radiation Safety Officer  
Lieutenant Colonel George Kontra, Member, Chief, Radiological Branch  
Major D. S. McClelland, Member  
Major C. W. Stagner, Member  
Captain H. T. Uhrig, Medical Member

This committee meets upon the call of the committee chairman and at least once quarterly. Records of committee meetings are maintained. The Commandant of the Army Chemical Corps School is charged with the responsibility for the safe use of radioactive material within the school. The committee advises and assists the school commandant in discharging this responsibility. This committee has written safety procedures entitled "Radiation Safety".

The Radiological Safety Officer is a member of the Radioisotopes Committee and serves as the recorder of that committee. Currently, this individual is Lieutenant Colonel Clarence H. Colgin. In addition to being the radiation safety officer, Colonel Colgin also is the Chief of the Health Physics Branch of the Technical Division. Colonel Colgin has within his Branch, five enlisted men and a secretary to assist in the performance of the Health Physics function of the Radioisotopes Committee. These five individuals are Sergeant Major P. W. LaVie, Chief Health Physicist; Master Sergeant A. Levine, Hot Cell Health Physicist; - both of these individuals have completed the two year course at Ft. Belvoir Reactor School in which they served as reactor health physicists plus the two weeks basic course at Ft. McClellan Chemical School - Staff Sergeant E. W. Kelley, Surveyor and Chief, Dosimeter Section; Specialist 1st Class J. E. Baxley, Dosimetry; Specialist 5th Class E. N. Self, Hot Cell Operator; and Mrs. Charlotte F. Stanford, Branch Secretary.

Colonel Colgin and these six individuals work directly for the Radioisotopes Committee. However, from an administrative standpoint, Colonel Colgin does not report to the Commandant of the school, but rather to the Chief of the Technical Division. This individual, also, is the Deputy Chairman of the Radioisotopes Committee. Colonel Colgin stated that all enforcement action for noncompliance with the procedures of the licensee is conducted by the Commandant of the School upon the recommendation of the Radioisotopes Committee. Colonel Colgin replaced Captain Conrad M. Knight as the Radiation Safety Officer on May 26, 1960.

Arrangements for this inspection were made by telephone on September 1, 1961. The licensee was represented throughout the inspection by Colonel Colgin. Upon completion of the inspection, results were discussed with Colonel Parks, Colonel Webber, Colonel Harris, and Colonel Colgin.

No State Health Department representative was invited for this inspection.

#### 11. Program

The Army Chemical Corps School has the responsibility for specialized training of enlisted and officer specialists for chemical, biological, and radiological warfare. The radioactive material possessed under these licenses is used as an integral part of the training of these specialists in radiological warfare. A portion of this training is conducted in a radiation field exercise area known as "Pelham Range". This area contains 417 Cobalt-60 sources held in pipes fixed in the ground. In the conduct of this training, the students map the radiation field resulting from the exposure of Cobalt-60 sources within these pipes. The special nuclear

material (25 milligrams of Uranium-233) possessed under Special Nuclear Materials License SNM-344, as amended, is used for a field exercise of alpha monitoring at a location other than Pelham Range. These plates are placed on metal plates within the alpha monitoring field. The purpose is to provide trainees a field exercise approximating a weapon accident site. The licensee uses Iodine-131, Cobalt-60, Tungsten-185, Phosphorus-32, Zinc-62, Zirconium-Niobium-95, Mercury-203, Silver-111-110 for laboratory exercises for isotope determination by energy and half life and for scaler exercises.

In addition to the isotopes named above which are used for training purposes, the licensee possesses a Cobalt-60 source in a UDM-1 calibrator and a Cesium-137 source in a UDM-1A calibrator. These sources are used for the calibration of health physics instruments and for film calibration. In addition to the isotopes above, possessed under licenses issued to the U. S. Army Chemical Corps School, this organization possesses 30 Strontium-90 sealed sources ranging in size from 26.7 millicuries through 33.7 millicuries for use in a TS-784 instrument calibrator. These sources are possessed under the license issued to the Lexington Signal Depot, according to Colonel Colgin. The Chemical Corps School has no copy of this license issued to the Signal Depot. The licensee possesses 20 radium sources ranging from 1.04 milligrams to 106.2 milligrams in size. These are used as laboratory radiation sources. The licensee possesses, in addition, a Strontium-90 sealed source of unknown size for each survey meter Model AN/PDR 39. The size of this Strontium-90 source is not known to Colonel Colgin. Additional sources of Krypton-85 are contained in the meter AN/PDR 43. The licensee possesses Uranium-238 M-7 sources and natural uranium M-3 sources which also are not held under licenses issued to the U. S. Army Chemical Corps School. According to Colonel Colgin, these M7 and M3 sources are Chemical Corps items of issue. These are instrument calibration sources.

In addition to performing training for the United States Army, the U. S. Army Chemical Corps School offers this course to selected specialists of foreign nations and to selected specialists of the Air Force, the Marine Corps, and the U. S. Navy. Yearly, approximately 60 classes with 45 pupils per class are trained at the U. S. Army Chemical Corps School.

12. Material-on-hand

See Exhibit A to this report.

13. Facilities and Equipment

A major facility for the use of radioactive materials at the U. S. Army Chemical Corps School is the field exercise area known as Pelham Range. This is an area approximately 0.2 square miles in size located at a distance of approximately 17 miles from the main post of Ft. McClellan. A Cobalt-60 exposure field at Pelham Range consists of 417 encapsulated sources which were installed in 1954-55. At the time of installation, according to Colonel Colgin, these sources ranged in size from approximately 5 curies to approximately 40 curies. These sources are semi-permanently installed in vertical pipes placed in the ground. Each individual pipe is approximately 5 feet high of which approximately 4 feet is beneath ground level. These pipes are approximately 2 inches in diameter and have welded to the bottom a steel plate. The Cobalt-60 sources are within a lead weighted 3/4" steel pipe. These are connected by a pulley arrangement in such a manner that the source can be raised from a distance of approximately 20 feet from the source pipe by pulling on a cable. These sources normally are in the exposed position. They are lowered only routinely for maintenance of the radiation field and for leak testing. The Pelham Range Area is in a remote area and is completely enclosed with an approximately 7 foot high fence of hog wire topped with three strands of barbed wire. This fence is marked at approximately 50 foot intervals with magenta on yellow signs showing the conventional symbol and the words "Caution - High Radiation Area". In addition, at the gates to this area, signs are displayed showing "Caution - Radioactive Material".

The Uranium-233, under special nuclear material License SNM-344 as amended, also is used in a field exercise. The area in which this material is used, is a fenced area of approximately 150 feet square. The door to this fenced area is locked with padlocks. Within this area, the Uranium-233 deposited on plates are placed on pads throughout the area to simulate a weapon accident site. Access to this area is controlled through access to the keys to this padlock. The area is used for student training in alpha monitoring. The plates are not permanently installed, but are placed within the fenced area for each exercise and removed following the exercise. The exercise is conducted to simulate an alpha contaminated area and exit from the field following the exercise is accomplished through a decontamination and monitoring station. The area is marked with magenta on yellow signs showing the conventional symbol and the words "Caution - Radiation Area". In addition, each gate bears a sign showing the conventional symbol and the words "Danger - Radioactive Material". At the time of the inspection there was no radioactive material inside the exercise area; rather, all the Uranium-233 plates were stored within the storage facility of the Chemical Corps School.

The licensee maintains health physics offices and instruction laboratories within the U. S. Army Chemical Corps Headquarters at Ft. McClellan. Building 3181 houses the health physics offices, the film badge calibration section, a health physics radioisotopes laboratory, and a scaler laboratory. The calibration section is under the direct supervision of Staff Sergeant E. W. Kelley. Film badge interpretations are performed by this section for all individuals, both permanent party and students who are required to wear film badges by the U. S. Army Chemical Corps School. Interpretation is accomplished using a Los Alamos Film Densitometer Model FD-3, Serial No. 209. Within this section are maintained film badge records for all interpretations rendered by the section.

Room 35 of Building 3181 is the radioisotopes laboratory. In this laboratory are accomplished health physics measurements and, also, sample preparation for student instruction. The laboratory had posted on the door leading into the hallway, a magenta on yellow sign showing the conventional symbol and the words "Caution - Radioactive Material". Immediately inside the door is a "reminder" sign containing the following "Do You Have Film Badge, Rubber Gloves, Planchet Tongs, GM Counter?". This laboratory is equipped with stainless steel bench tops and plastic tile flooring. A stainless steel lined radioisotopes hood is provided. The air exhaust from this hood is directly to the outside through filters. The sash to this hood was labeled to show the conventional symbol in magenta on yellow and the words "Caution - Radiation Area". Metal trays lined with absorbant paper are provided for work involving radioisotopes. Within this hood, samples are prepared for student instruction. These are prepared by using a remote pipetter device to transfer liquid from stock solutions or dilute solutions directly to planchets. These are evaporated under heat lamps and covered with "Saran" wrap or cellophane tape. On one of the bench tops, there is provided a shielded storage area in which dilute solutions of radioisotopes are stored within flasks. This storage is temporary, the solutions being prepared immediately prior to the class in which they will be used, then placed behind this shield prior to use. The storage area was lined with absorbant paper. The shielding was provided by solid concrete blocks providing approximately 3 inches of concrete shielding. The glassware stored behind these brick shields at the time of the inspection was empty but was individually labeled to show the conventional symbol and the words "Caution - Radiation Hazard". For a waste container, a 30 gallon garbage can is provided. This is painted yellow with a conventional symbol displayed and the words "Danger - Radiation Hazard" and "Hazard - Contaminated Waste". This container read a maximum of 2.5 mr/hr with a GM meter with the detector in contact with the exterior of the can. According to Colonel Colgin, normal laboratory wastes such as possibly contaminated paper and glassware are placed in this can. A locked steel file cabinet numbered X350 within this laboratory is used for the storage of standard sources and student counting planchets. Using a geiger meter, the maximum radiation level detected exterior to this safe was 1 mr/hr. Each drawer to this safe was tagged with a magenta on yellow sign showing the conventional symbol and the words "Caution - Radioactive

Material". This safe held Cobalt-60 counting sources (each source reading a maximum of 1.5 mr/hr with the thin end window detector in contact with the source), Silver-111 sources and Zinc-65 sources (each source reading 1 mr/hr with the thin end window geiger detector in contact with the source) and Strontium-90 sealed sources of approximately 30 millicuries each which are used within the instrument calibrator Model TS-784. A maximum reading of 25 mr/hr was detected at 13 inches from the sealed sources. These sealed sources are marked to show "Danger - Radioactive Material - Strontium-90 - 30 Millicuries - D59 Nuclear Chicago 1959". This safe is normally locked with the keys controlled by Colonel Colgin and by the individual user of this radioactive material. Also within this laboratory stored next to this file cabinet in a U. S. Army field safe are the stock solutions of radioactive material. The safe was marked to show in magenta on yellow, the conventional symbol and the words "Caution - Radioactive Material". A maximum radiation level of 5 mr/hr was detected with the geiger detector against the surface of the closed safe. Within the safe the radioactive material was stored within individual lead containers. These are tagged to show "Caution - Radioactive Material", to show the isotope contained, the date, and a volume assay. <sup>1/</sup> This tag did not show the millicurie content of each of these containers. At the time of the inspection, the safe held, in individual containers, the first eleven radioisotopes listed in Exhibit A. For counting equipment within this laboratory, the licensee had a Baird-Atomics Model 132 beta-gamma counter and a radiation instrument development laboratory 49-54 counter. A hand and foot counter is located within this laboratory, however, at the time of the inspection this device was not operative.

Adjoining the radioisotope laboratory is Room 36 which is known as the "Scaler Laboratory". Room 36 has two doors leading into the hallway and one door leading into the radioisotopes laboratory. The scaler laboratory is equipped with wooden bench tops and plastic tile flooring. No loose radioisotopes, according to Colonel Colgin, are handled in this laboratory, - Only covered counting samples. The laboratory contains 16 Baird-Atomics Model 123 scalers with thin end window GM detectors used for student instruction. Located at each bench for a group of Baird-Atomics scalers is an AN/PDR 27C GM portable survey meter. This meter has scale readings of 0 to 0.5, 0 to 5, 0 to 50, and 0 to 500 mr/hr. Located against one wall of the scaler laboratory is a storage area used for the storage of instrument calibrators Model TS784. This area is roped off. The ropes are posted with signs showing the conventional symbol of magenta on yellow and the words "Caution - Radioactive Material". The work bench immediately adjacent to this storage area is not used. Using a GM meter, the radiation level at the boundary of the roped area was 1 mr/hr. Stored in racks against the wall at the storage area, are calibrators TS-784 holding Strontium-90 sources of approximately 30 millicuries each. The TS-784 calibrator is labeled in magenta on yellow to show the conventional symbol and the words "Caution - Radioactive Material". In addition, a second label shows the conventional symbol "Danger - Caution - Radioactive Material - Radioisotope - Strontium-90 - Activity in Millicuries, Date Manufactured April 1959". Using a GM survey meter, at the face of this storage rack, the radiation level was 7 mr/hr. The storage rack is so constructed that rods inserted into the rack which are held by padlocks prevent the unauthorized removal of the calibrators. In the room opposite the wall against which the calibrators are stored, the maximum radiation level, using a GM meter was 0.5 mr/hr. This room is a classroom with the first row of desks approximately 5 feet from this wall. The doors to Room 36, the scaler laboratory, are posted to show in magenta on yellow, the conventional fan-shaped symbol and the words "Caution - Radioactive Material" and "Caution - Radiation Area".

For health physics purposes, the licensee had stored within the film dosimeter room 14 dosimeters with full scale readings of 200 mr, three Staplex air samplers, two AN/PDR 27 survey meters (GM meters), two AN/PDR 39 survey meters (ionization chamber meters), and one Juno ionization chamber survey meter. All instruments were in operable condition.

Across the street from Building 3181, is Building 3182. This is a V-shaped building, (See Exhibit B). Within this building are located Lab "V" and Lab "W" in which radioactive materials are used. Between these two labs is provided a storage facility for instrumentation within Building 3182.

Between the two wings of Building 3182 and outside of the building, is a storage vault which has been constructed for the storage of radioactive material. This is Building 3180. The entire area to the rear of Building 3182, for a distance of approximately 150 feet is enclosed with chain link fencing approximately 7 feet high topped with three strands of barbed wire. Located within this enclosed area is the storage vault 3180 and Building 3192 which houses the licensee's hot cell.

As an individual enters the front door of Building 3182, Lab "V" is located in the left wing of this building. This laboratory had posted on its door in magenta on yellow the conventional symbol and the words "Caution - Radiation Area". In addition, a sign stated "Danger - Radiation Personnel Without Film Badge Not Allowed Beyond This Point - No Smoking, Eating or Drinking in this Lab". According to Colonel Colgin, all exercises in Laboratory "V" are conducted with radium. From Laboratory "V" there are two doors leading directly to the outside of the building. Both of these doors are posted in magenta on yellow to show the conventional symbol and the words "Caution - Radioactive Material". Laboratory "V" is used for student exercises for shielding determinations and inverse square determinations. The key to Laboratory "V" is controlled by the custodian of the building. A second key is in the possession of the officer of the day, however, this key is in a sealed envelope and if the envelope is broken, a notation as to the cause for removal of the key must be made in the officer of the day's log. An AEC Form 3 was posted in Laboratory "V". No radioactive material is stored in Laboratory "V"; rather, the radium is stored within lead containers on a dolly and this is stored within vault Building 3180. The radium sources were tagged in magenta on yellow to show the conventional symbol and the words "Danger - Warning - Radioactive Material - Radioisotopes", the activity, the date and the manufacturer. At the time of the inspection a class was in progress in Laboratory "V". It was noted that in addition to the instructor to this class, a second noncommissioned officer was present to serve as the Radiation Safety Noncommissioned Officer. Laboratory "W" located in the other wing of this building, contains two instrument calibrators. The door to this laboratory is equipped with flashing lights of three colors - a red light when flashing indicates, according to a legend on this door, that the calibrator is in use; an amber light flashing shows that the source is attenuated; a green light flashing shows that the source is safe. The door to Laboratory "W" was posted to show the conventional symbol and "Caution - Radiation Area". <sup>2/</sup> Two additional doors to this laboratory leading directly to the outside of the building are posted to show in magenta on yellow, the conventional symbols and the words "Caution - Radioactive Material". Within this laboratory is located the instrument calibrator UIM-1A holding a Cesium-137 source. This calibrator is marked to show in magenta on yellow the conventional symbol and the words "Danger - Warning Radioactive Material - Radioisotopes, Cesium-137 - Activity, 37 RHM, Date 4/29/59". The device is locked with a padlock. A radiation level of 3.5 mr/hr at 6 inches from the shielded device was detected using a GM meter. This device is interlocked with the door leading to this room so that if the door is opened when the source is in the exposed position, a bell sounds and the visual signals ~~displayed~~ above are activated. The second calibrator Model UIM-1 held a Cobalt-60 source. This calibrator was labeled to show in magenta on yellow the conventional symbol and "Danger - Warning - Radioactive Material - Radioisotopes, Cobalt-60 - Activity 7.8 RHM - Date 6/23/53". This device read 40 mr/hr with the geiger detector in contact with the surface of the device. The UIM-1 calibrator is not interlocked with the door. When it is in use, there is no alarm when an individual enters the room. <sup>3/</sup> However, according to Colonel Colgin, the device is in constant attendance when it is in use. The arrangement of the room is such that should an individual enter the room when the calibrator is in use, he would be in an area other than the direct radiation of this calibrator. According to Colonel Colgin the UIM-1 calibrator is used monthly for film calibration. For this calibration the source is in the exposed position approximately 15-20 minutes.

Between the two wings of the Building 3182 is located the storage vault, Building No. 3180. This vault is on a concrete pad at an approximately equal distance from each of the two wings. The vault is posted to show in magenta on yellow the conventional symbol and the words "Danger - High Radiation Area" - and "Danger Radioactive Material". The vault is not

<sup>2/</sup> 10 CFR 20.203(c)(1)

<sup>3/</sup> 10 CFR 20.203(c)(2)

equipped with an audio or visual warning system. Immediately adjacent to the vault is a water filled well capped with a 5 inch lead cap. This reads 3 mr/hr at contact with the cap. Colonel Colgin stated, and survey records showed, that with the cap removed a maximum radiation level of 5000 mr/hr was detected above the water in this well. This well was not posted in any fashion to show that it contained radioactive material nor to show the quantity of material contained. <sup>4/</sup> Colonel Colgin stated that he did not know the quantity of the type of radioactive material stored within this well. No receipt records exist for this material. <sup>5/</sup> Stored exterior to the building with the two wooden boxes holding M3 Cobalt-60 sources, each of these three boxes was padlocked. The boxes were marked to show "Caution - Radioactivity" <sup>6/</sup> and to display the conventional symbol. Within each box is a decay chart showing the serial number of the source, the date, the strength, and the isotope. These two M3 test containers were marked to show, in addition, in magenta on yellow the conventional symbol and "Danger - High Radiation Area". Using a geiger detector the maximum radiation detected with detector in contact with the wooden box holding each source was 7 mr/hr. Using the geiger detector against the vault building, a maximum radiation level of 25 mr/hr was detected exterior to the building. At the door the maximum radiation level was 2.5 mr/hr. The area to the northeast of this storage vault is roped off. The maximum radiation level at this rope was 1.5 mr/hr. Within this roped off area, were six approximately 5 ton lead storage containers, five of which were empty. The sixth container was posted in magenta on yellow to show "Caution - Radioactive Material" displaying the conventional symbol and the following "Isotopes Unknown, Curies Unknown, mr/hr at 5 Centimeters - 5 mr/hr; at one meter, 0.1 mr/hr; date July '61". The maximum radiation level using a GM meter against this container was 15 mr/hr. Colonel Colgin stated that he did not know isotopes stored within this container nor the quantity within the container. There are no records showing the receipt of this material. <sup>7/</sup> He suspects, however, that it contains several curies of Cobalt-60. When the plug on top of this container is raised, Colonel Colgin stated that radiation coming from between the raised plug and the container itself reads approximately 500 mr/hr at 12 inches. A stainless steel plaque is imbedded in the concrete pad immediately to the rear of the storage vault. This stainless steel plaque has stamped into it the following "Caution - Radioactive Contamination; Location - at a depth of 6 inches from top surface of concrete; Type-Strontium-90, Half-Life-19.9 years; 600 mr/hr on 7/28/59 at surface of spill".

Inside the vault was stored approximately 12 radium sources, a neutron source, and within a vault built within the side of the vault building an artillery shell holding some unknown radioisotope. No record of receipt exists for this radioisotope. <sup>8/</sup> At the exterior to the vault in which this artillery shell was stored, a radiation level of 200 mr/hr was detected with the detector probe against the surface of this inner vault. The reading at 18 inches from this vault was not established. This radiation level is within the vault Building 3180. According to Colonel Colgin, the maximum radiation level using an ionization chamber instrument placed in contact with the surface of this artillery shell is 17,000 mr/hr. The door to Building 3180 is double padlocked with the keys to these padlocks in the possession of the building custodian of Building 3182. In the area between the two wings of this building against the side of Laboratory "W", is roped off the waste shipment preparation area. The ropes to this area show "Caution - Radioactive Material". Wastes that are accumulated here in containers prior to shipment for disposal. At the time of the inspection a bottle of liquid laboratory waste in this area read 2 mr/hr with the GM meter directly in contact with the bottle which was marked to show "Caution - Radioactive Material". Also, within this area, is a contaminated vise showing a maximum radiation level of 3 mr/hr with geiger probe in contact with the device. Colonel Colgin stated that several determined efforts have been made to decontaminate the device and these were unsuccessful. Consequently, the contamination on this device is fixed contamination. Colonel Colgin anticipates using this device within the hot cell.

Within the fenced off area behind Building 3182 is located Building 3192 in which the Army Chemical Corps School hot cell is located. This Building is posted to show in magenta on yellow the conventional symbol and the words "Caution - Radioactive Material". The hot cell of the licensee has not yet been accepted by the Army but is still legally owned by the constructing contractor, Cook Electric Company. The hot cell has been used by

<sup>4/</sup> 10 CFR 20.203(f)(1) and (f)(4)

<sup>5/</sup> 10 CFR 30.41(a)

<sup>6/</sup> 10 CFR 20.203(f)(4) & (f)(1)

<sup>7/</sup> 10 CFR 30.41(a)

<sup>8/</sup> 10 CFR 30.41(a)

the Army solely for shielding tests of the integrity of the cell itself. At the time of the inspection, approximately 500 curies of Cobalt-60 was stored within a storage well within this cell.

Within the instrument storage area of Building 3182, were located numerous survey instruments. Of note were 15 AN/PDR 18A instruments containing a 100 microcurie Strontium-90 internal calibration source. This instrument was marked in magenta on yellow to show the conventional symbol and the words "Danger - Warning - Radioactive Material, 100 Microcuries - Strontium-90". There was no date on this label. <sup>9/</sup> According to Colonel Colgin these instruments had been received in 1954, and are possessed under the Lexington Signal Corps license. These instruments, although possessed by the U. S. Army Chemical Corps School since 1954, have never been leak tested. <sup>10/</sup> The licensee possessed, in addition, 9 AN/PDR 10 B instruments containing a Uranium-238 internal calibration source. These instruments are marked to show in magenta on yellow the conventional symbol and the words "Danger - Warning - Radioactive Material, Radioisotope U-238 - 0.01 Microcuries" and no date. <sup>11/</sup> Also, stored were 10 AN/PDR 43 instruments. These instruments are marked to show in magenta on yellow the conventional symbol and the words "Danger - Warning - Radioactive Material - Krypton-85, 80 microcuries, 6/59".

The AN/PDR-27C survey meters possessed by this licensee contains radium calibration sources. Also stored within this instrument facility within Building No. 3182 were the alpha plates containing Uranium-233. Each of these plates were marked to show "Caution - Radioactive Material, Isotope U-233" and the conventional symbol in magenta on yellow. These plates which were marked to show "Caution - Radioactive Material, 12/1960, uranium-oxide, less than 1 mc". The doors to the storage area within this building in which these instruments and sources were stored was marked "Caution - Radioactive material" and showed in magenta on yellow the conventional symbol.

#### 14. Radiological Safety Practices

Use of radioactive material by this licensee is under the control of the radioisotope committee as discussed in Item 10 above. This committee reviews each proposed use of radioisotopes by this licensee and formally acts to approve or disapprove such uses. The individual actually using the radioactive material does not submit to this committee a formal application, rather radioisotopes under this license are used within formal courses of instruction at the US Army Chemical Corps School. Consequently, the committee is aware of those classes in which radioactive material must be used and the procedures for the use of this material are reviewed by the committee based on the needs for teaching within this class and based on the qualifications of the teacher. The teacher or instructor using the radioactive material initially is interviewed by the radiation safety officer and his evaluation of this instructor is presented to the committee. In addition, prior to the use of radioisotopes, the facilities and equipment for that use must be reviewed by the radiation safety officer. Procurement control is exercised through this radiation safety officer. The S-4 Sections (Supply) of US Army Chemical Corps School and of the US Army Chemical Training Command at Fort McClellan have been informed that no radioactive materials are to be ordered without the expressed approval of the radiation safety officer.

The radiation safety officer and his staff as presented in Item 10 above are employed essentially full time on radiation protection work. The hot cell operation of this licensee, once it is instituted, will come under the direction of the Health-Physics Branch. The selection of this branch to be the operating group for the hot-cell was made due to the fact that the hot-cell would be used as a service facility for the individual users of radioisotopes. In addition to serving as the radiation safety officer, Colonel Colgin also is an instructor at the Chemical Corps School. The enlisted personnel named under Item 10 are used full-time (other than normal military duties) in a health-physics capacity.

Under the direction of the radioisotope committee, the radiation safety officer has written safety procedures. These appear as Chapter 12 to the

- 9/ 10 CFR 20.203(f)(4)
- 10/ License Condition 16
- 11/ 10 CFR 20.203(f)(4)

Standard Operating Procedure of the US Army Chemical Corps School. As such, these procedures governing safety practices are distributed to each staff member and member of the permanent party of the Army Chemical Corps School. The licensee is equipped with adequate facilities and equipment for the handling of those radioisotopes used within the teaching program. A recently constructed hot cell which will be under the direct supervision and use of the Health-Physics Branch has been provided to permit handling of large sources of radioactive material. Although complete, this hot cell has not been accepted by the Army. The Health-Physics Branch provides a survey service for the Chemical Corps School. The laboratories and storage facilities are surveyed on an established frequency after each use of radioactive materials or at one month intervals whichever is less. The licensee, for the use of radioactive material, provides adequate instrumentation. Both GM and ionization chamber portable survey meters are available for the use with radioisotopes. These meters are possessed in quantities above 10 by the licensee and are "military issue" instruments. The licensee provides two types of film badge service. The first type is the film badge service for the permanent party. Each member of the permanent party of this school wears two film badges. One of these is supplied and interpreted locally by the licensee and the second is supplied and interpreted by the Lexington Signal Depot. The Lexington Signal Depot badge is exchanged on a frequency of four weeks. The locally supplied badge is exchanged on a frequency of three 3-week badges and one 4-week badge per calendar quarter. The period of wearing the 4-week badge which is interpreted locally is arranged so that this four week period will coincide with one of the four week periods of the Lexington Signal Depot badge. Consequently, the licensee is able to obtain a direct comparison of readings and interpretation of his own service as compared with that of the Lexington Signal Depot. This comparison is made a matter of record.

All students who attend the Army Chemical Corps School and who may be exposed to ionizing radiation are furnished with film badges. These film badges are supplied and interpreted locally. Only one film is worn throughout a class course by each student. In order to determine that the exposure levels of individuals under 18 years of age are appropriately restricted, the licensee has devised what is entitled "film badge locator". This locator is a form filled out by each student as he is issued a film badge. (See Exhibit C). On this locator form, the student is required to furnish his date of birth. For each class, upon completion of this locator form, the forms are reviewed by the dosimetry non-commissioned officer and those individuals under 18 years of age are made known to the instructors and are informed that they will not participate in the radiation field exercise at Pelham Range. In addition, upon arrival at Pelham Range, the instructor in charge of that phase of the training course again inquires as to whether any individual within the class preparing to enter the field exercise area is below 18 years of age. The licensee has established a system in which each class in which radioactive materials are used has a non-commissioned officer or an officer who serves solely as a radiation safety officer. These individuals have no other duties within this class other than to oversee the radiation safety of the class. Two categories of these radiation safety officers and radiation safety non-commissioned officers have been established by the Health-Physics Branch. One of these categories is for those individuals considered by the committee to be qualified to provide safe supervision for any use of radioactive material. The second category is for those individuals who are considered by the committee to be appropriately qualified to provide safety supervision only for a portion of the uses at the licensee's facility. Generally, Category 1 radiation safety personnel are qualified to provide the safety supervision for any use of radioisotopes. Category 2 radiation protection personnel are competent to provide safety supervision only for the use of radioisotopes in a sealed source form. The designation of individuals to be either Category 1 or Category 2 radiation protection personnel is accomplished by the radioisotope committee. This committee reviews the qualifications of each concerned individual before his designation into the appropriate category.

For special projects such as leak testing of Pelham Range, the licensee provides individuals involved in the work with pocket dosimeters. These

dosimeters have a full scale of 200 mr. Colonel Colgin stated that he had made several attempts through military channels to procure pocket dosimeters reading up to 5 roentgens full scale. Colonel Colgin stated that it is an army regulation that procurement first be attempted through military channels before procurement can be made from outside military channels. During the visit of the AEC representative, Colonel Colgin received a reply from the Navy with regard to procurement of a 5 roentgen dosimeter. This communication stated that although the Navy did have such an item as an item of issue, it was in short supply and was being supplied solely to nuclear submarine personnel. Consequently, the Navy would supply Fort McClellan with a substitute item showing a full scale reading of 10 roentgens. Colonel Colgin stated that this full scale reading was excessive and he would consider, since military supply channels had been exhausted, to request permission to procure self-reading dosimeters having a full scale of 5 roentgens from sources other than military supply.

Those areas within the licensee's facilities where radioisotopes are used and are stored are within locked fenced areas or within buildings which are controlled. Keys to the laboratories within buildings where radioactive material is stored or used are controlled. A key to each facility is available to the Health-Physics Branch and to the individual user of the facility. Upon completion of use of any facility, the facility is locked. In addition to keys being possessed by the Health-Physics Branch and the individual user, a copy of each key is in the possession of the Officer of the Day within a sealed envelope. Should the envelope be opened, an explanation of why it was necessary to remove this key must be made in the Officer of the Day's Log.

The licensee through its Health-Physics Branch maintains a locator file on radioisotopes. This, in effect, is a running inventory of all radioactive material possessed by this licensee. At any time, Colonel Colgin states, he can go to the facility shown within the locator file and provide an accurate inventory of each radioisotope possessed at Fort McClellan. This locator file is up to date only for those sources received since May 1960.

Each area in which radioactive material is stored and used was marked with radiation warning signs or radioactive material signs. The wording on these signs is discussed in Item 13 above.

Colonel Colgin stated that during the use of radioactive materials within the various teaching laboratories, he will appear unexpectedly within the laboratory to inspect or check upon the safe use of the radioactive material.

## 15. Records

- a. Records of receipt - Since May of 1960, a record of receipt of radioisotopes has been maintained by this licensee. This record shows isotope, quantity, date, and supplier of radioactive material. In addition, this radioactive material receipt record is shown in the locator file which shows also the location of each radioisotope possessed by this licensee, however, the licensee possesses several large quantities of unknown radioisotopes for which no receipt document exists. These are principally (1) the 417 Cobalt-60 sources ranging in size from  $\frac{1}{2}$  - 40 curies of Cobalt-60 located at the Pelham Range Area (2) a quantity of unknown radioactive material stored within an approximately 5 ton lead shield at the vault area of the licensee's facility (3) a quantity of unknown radioisotopes stored within an artillery shell reading 17,000 mr/hr at contact within the licensee's storage facility (4) an unknown quantity of radioactive material stored within a water-filled well immediately outside of the storage vault at the licensee's storage area. <sup>12/</sup> Item 15e shows the information contained within the locator file which demonstrates the receipt of material as well as the material currently on hand.
- b. Radioisotope Committee Minutes - Formal minutes are written for each meeting of the radioisotope committee. This committee meets upon

special call of the chairman and at least once per quarter. Minutes were reviewed for the meetings of February 20, 1961, March 15, 1961, June 28, 1961, and August 4, 1961. Committee minutes consider such subjects as the re-encapsulation of Pelham Range sources, the construction and utilization of the hot-cell, the appointment of Category 1 and 2 radiation safety officers, and a review of film badge records.

- c. Waste disposal records - Complete records of the last two radioactive waste shipments are maintained. These records show quantities of radioisotopes shipped, date of shipment, method of shipment, facility to which shipped, survey of the shipment to include wipe test of exterior packages and an inventory of radioactive material shipped by package number. Complete records are maintained for shipments made on October 11, 1960, and June 13, 1961. Correspondence exists in the waste disposals file regarding shipments of disposals of radioactive wastes on approximately March 6, 1959, and June 11, 1958, however, the disposal records does not show specifically the radioactive materials disposed of nor the fact that the material ever was disposed of. The correspondence dated March 6, 1959, regarding wastes stated that twenty-three 55-gallon drums containing small amounts of Cesium-137, Mercury-203, Phosphorus-32, and large amounts of Cobalt-60 had been packaged and requested information regarding disposal. There is no record to show that disposal was ever actually accomplished.<sup>13/</sup> It stated also that the millicurie activity of these packages is unknown, however, these packages read up to 5000 mr/hr at contact. Correspondence of June 11, 1958, also asked for disposal information concerning 11 packages of waste. These packages, the contents of which are unknown, read up to 4,000 mr/hr at contact. This waste is not presently possessed by the licensee.
- d. Survey Records - Survey records are reviewed for the period July 13, 1960, through August 29, 1961. During this period, 38 surveys are on record of the licensee's facilities. These survey records show the instrument readings, the instrument type and number, the individual performing the survey, the number of smears made - the smear results, the measuring instrument showing type, background and voltage and the gross counts on smears. Attached to each of these survey results is a sketch of the area surveyed and smears results are keyed to this sketch. Approximately 10% of these smears show contamination in excess of background. This ranges up to 3716 counts per minute. This localized area was decontaminated.
- e. Radioisotope Locator - The radioisotope locator file shows a history for each radioisotope shipment received. This history shows the radioisotope, the chemical form, the containment, the half-life, the emission, the supplier, the date of receipt and shipment number, the supplier's assay, the storage location and the date. For sealed sources, the file shows in addition, a leak test section which shows the date of leak test, the type leak test performed, the count, the surveyor and the initials of the individual performing the survey. In addition, this locator form shows disposal as to date and action taken. Once the radioactive material has been completely used and disposed of, the assay document accompanying the shipment of material is stapled to this locator form. The locator form is prepared in duplicate. Upon receipt of the material, one copy goes into the Health-Physics file, the second copy is maintained by the individual user who completes the use of this material as it occurs. Consequently, from this record in the hands of the Health-Physics Branch and the individual user, the precise amount of radioactive material on hand at any given time can be ascertained. For liquid radioisotopes, such as those used for radioisotope laboratory experiments, an additional form known as a dispensation record is maintained by the individual user which shows each removal of radioactive material from the stock solution. Upon completion of the use of this material, either through decay, having used all the material or through transfer of the material to Colonel Colgin as waste, this dispensation form as well as the assay document is stapled to the locator form. Exhibit A showing the material received by this licensee was taken from this locator file. As can be seen from Exhibit A no date of receipt exists for certain radioisotopes. <sup>14/</sup>

- f. Personnel Exposure Records - For all permanent party personnel, an AEC Form 4 and an AEC Form 5 are maintained. As described in Item 14 above, staff and faculty (permanent party personnel who are routinely exposed to ionizing radiation) wear both a film badge from the local Ft. McClellan service and from the Lexington Signal Depot service. A comparison with these results is made. For students who are not permanently assigned to Ft. McClellan, the school prepares a Form 303 (See Exhibit D) which is sent to the Commanding Officer of the student. On this Form 303 is listed the exposure received by the student during his participation in the course at Ft. McClellan. This is recorded by the Commanding Officer of the student into the Health Record of the student. Film badge records for students were reviewed for the year 1961. Forty-seven classes thus far have been trained by the licensee during 1961. The maximum exposure received by any student during 1961 is 460 mr. This student received this exposure during the period 16 to 27 January, 1961. A letter from the licensee to the Commanding Officer of this student stated that he was to receive no additional ionizing radiation prior to April 1, 1961. Exhibit E shows the maximum exposures received by any member of each student class during the year 1961. No Form AEC 4 or 5 is maintained for students.

For permanent party personnel, a Form AEC 4 and AEC 5 are maintained. The film badge reports from the Lexington Signal Depot as well as from the Army Chemical School are on file. According to Colonel Colgin, the higher reading of the two is considered the valid reading. A summary of exposures received by the permanent party is shown as Exhibit F to this report. It should be noted that two individuals, E. W. Kelly and T. W. LaVie, both have skin exposures in excess of 5 rems for the current quarter. The breakdown of this exposure is also shown in Exhibit F. This exposure was received while visiting the SL-1 reactor incident site and it is reported to the Army Chemical School by a letter of August 15, 1961, from the US Army Chemical Corps Radiation unit, Dugway, Utah.

16. Posting

Posting and labeling is considered under Item 13 above - the licensee did have posted at appropriate locations Form AEC 3.

17. Waste Disposal

According to Colonel Colgin, no radioactive waste is disposed of by release into the drain, rather all radioactive waste is turned over by individual users to Colonel Colgin for disposal. Solid wastes are packaged in 55 gallon drums, lined with concrete so as to provide approximately 3 inches of concrete shielding on all sides. Liquid radioactive wastes are mixed so that the liquid waste serves as the water component of concrete. This also is placed in 55 gallon drums for disposal. All 55 gallon waste drums have the lids welded on prior to shipment. The two shipments described under Item 15c above were disposed of by shipment to the Army Chemical Center, Maryland. Prior to these shipments, according to Colonel Colgin, wastes had been disposed of by direct shipment to the Oak Ridge National Laboratory.

18. Leak Tests

Leak tests are performed by this licensee. This consists of wiping the concerned source with a cotton swab and counting the source within a Baird-Atomics measuring system. The last three leak test records of Pelham Range were reviewed. Leak tests were performed on July 6, 1960, December 14, 1960 and June 30, 1961. The maximum results recorded within the log maintained on the Pelham Range leak test was 1738 counts/minute. According to Colonel Colgin, counting results of three times background is considered to be a leaking source. Since July 6, 1960, every source well on Pelham Range has been examined and the condition noted in this Pelham Range Log. On June 30, 1961, every source capable of being tested

was tested. Those sources which were incapable of being tested were those stuck either in the exposed position or the down shielded position within the range. On June 30, 1961, 308 sources were tested - 55 of which were marked as leaking within this range log. Within the log, it is noted that source well number 236 shows a reading of 30 to 50 roentgens/hour in a 3' x 3' area and it is noted that it is suspected that a capsule is outside the pipe. Colonel Colgin stated that this was correct - that the capsule was recovered and placed back in the pipe.

19. License Conditions

Condition 10 - Place of use is as stated on the license - The licensee stated that the use of this radioactive material has occurred solely at Ft. McClellan, Alabama.

Condition 11 - The licensee shall comply with 10 CFR 20. For status of compliance, see details above.

Condition 12 - Byproduct material shall be used by individuals approved by the isotope committee - According to the licensee, all individuals using or supervising the use of the radioactive material are approved by the Isotope Committee. Student use is under the direct supervision of an approved user.

Condition 13 - Byproduct material and sealed sources shall not be opened. The licensee stated that he has not opened any sealed sources, however, with the completion of this hot cell, the licensee intends to make application for amendment to his license to permit reencapsulation of sealed sources.

Condition 14 - The licensee shall comply with representations of this license, application, dated 9/16/60 and memorandum dated 2/21/61 and Chapter 12 of the SOP Radiological Safety. For status of compliance, see details above.

Condition 15 - Notwithstanding Section 10 CFR 20.203(c)(2), Pelham Range need not be equipped with control devices. It shall be secured by a fence and by a patrolled road - Pelham Range is completely enclosed with padlock gates. A road surrounding Pelham Range is subject to patrol by mounted guards.

Condition 16 - With the exception of sources on Pelham Range, each sealed source shall be leak tested at intervals not to exceed six months and prior to use unless a certificate of leak test is obtained from the supplier; leak tests shall be sufficient to detect 0.005 microcuries of contamination - For compliance with this section, see details above.

Condition 17 - Sealed sources at Pelham Range will be leak tested so that 10% are tested at six month intervals; if any leaking sources are found within the initial 10% at any six month interval, an additional 10% shall be tested. If leaking sources are found in the second 10% tested, all sources shall be tested; all leaking sources shall be withdrawn and disposed of. For status of compliance, see details above.

20. Miscellaneous

a. As stated in Item 13, Page 8, there is embedded in the concrete pad surrounding the storage vault a stainless steel plaque on which is stamped "Caution - Radioactive Contamination; Location at a depth of 6 inches from top surface of concrete; Type - Strontium-90; Half-life - 19.9 years; 600 mr/hr on 7/28/59 at surface of spill". Colonel Colgin stated that he is not aware of the occurrence causing this spill. He stated there are no records existing with regard to the spill.<sup>15/</sup>

According to Colonel Colgin the spill occurred in December 1958. Colonel Colgin was not the Radiation Safety Officer at that time and had no responsibility or authority with regard to the radiation safety program. He stated that at his suggestion the plaque was placed on the location of the spill after the spill was covered with 6 inches of concrete. Colonel Colgin stated he is not aware as to whether the Commission was notified of this spill., or whether, in fact, the spill constituted an incident under the regulations in force at that time. Colonel Colgin stated that he did recall mention of concrete being "chipped up" at the location of the spill and that the spill involved the spill of a liquid. Colonel Colgin was not aware of the time required to correct this situation. 16/

- b. With regard to the receipt on 7/12/61 of Uranium-233, the licensee had not completed a Form AEC 388. 17/
- c. The M3 Cobalt-60 sources possessed by the licensee (see under Item 13, Page 8) were not labeled to show the isotope, the date, nor quantity in millicurie amounts. Rather, these containers had inside them a chart showing isotope, date, and the quantity "urhm" quantities. 18/ Colonel Colgin stated each M3 source, to the best of his knowledge, was of 50 millicurie to 100 millicurie strength. One source was received in 1957; the other on 4/13/61. The licensee stated these sources had not been leak tested. The source received on 4/13/61 has not been used. 19/
- d. Although the AEC representative did not measure the radiation emanating at 18 inches from the vault (inside the storage vault, Building 3180) holding the artillery projectiles which read, according to Colonel Colgin, 17,000 mr/hr on the surface of the projectile, Colonel Colgin stated that definitely a radiation level of 100 mr/hr was measurable at 18 inches from this inner vault. The AEC representative measured a radiation level of 200 mr/hr with the meter in contact with the inner vault (see Item 13, Page 8, above). This storage vault is not equipped with a control device which activates an alarm or reduces the radiation level upon entry into the high radiation area. 20/
- e. The water filled well next to the radioisotope storage vault is constructed of two oxygen cylinders welded together to form a well approximately 5 to 8 feet deep. It is filled to about 6 inches from the surface with water. (See Item 13, Page 8, above). Although the contents of this well are unknown, Colonel Colgin states it is suspected the well holds Cobalt-60. It is unmarked. 21/

16/ 10 CFR 20.403  
17/ 10 CFR 70.54  
18/ 10 CFR 20.203(f)(1) and (f)(4)  
19/ License Condition 16  
20/ 10 CFR 20.203(c)(2)  
21/ 10 CFR 20.203(f)(4) and (f)(1)

Material on Hand  
U. S. Army Chemical Corps School  
Ft. McClellan, Alabama

<u>Isotope</u>	<u>Date</u>	<u>Amount</u>	<u>Location</u>	<u>Remarks</u>
I131	6/19/61	20 mc	Rad. Lab.	
Co60	9/1/61	5 mc	"	
W185	6/15/61	10 mc	"	
P32	8/23/61	50 mc	"	
Zn65	6/19/61	20 mc	"	
ZrNb95	6/19/61	20 mc	"	
Hg203	6/19/61	20 mc	"	
Hg203	3/25/60	13 mc	"	
Ag111	4/6/60	10 mc	"	
Ag111	3/13/61	20 mc	"	
P32	2/17/61	50 mc	"	All used
U238	1/61	95,000 c/m	"	M7 Alpha source
"	"	105,000	"	"
"	"	80,000	"	"
"	"	85,000	"	"
"	"	100,000	"	"
"	"	85,000	"	"
"	"	105,000	"	"
"	"	90,000	"	"
"	"	95,000	"	"
"	"	90,000	"	"
"	"	115,000	"	"
"	"	110,000	"	"
"	"	100,000	"	"
"	"	110,000	"	"
"	"	90,000	"	"
"	"	100,000 c/m	"	"
"	"	80,000	"	"
"	"	80,000	"	"
"	"	105,000	"	"
"	"	110,000	"	"
"	"	100,000	"	"
"	"	80,000	"	"
"	"	80,000	"	"
"	"	70,000	"	"
"	"	80,000	"	"
"	"	100,000	"	"
"	"	100,000	"	"
"	"	105,000	"	"
"	"	85,000	"	"
U233	7/12/61	$2 \times 10^5$ d/m	"	Sources No. A-1 through A-200
"	"	$3.9 \times 10^5$ d/m	"	" A-201 through A-300
"	"	$9.5 \times 10^5$ d/m	"	" A-301 through A-400
"	"	$1.9 \times 10^6$ d/m	"	" A-401 through A-500
Co60	1954	10 curies	Lab W	UIM-1 source - Leak tested 3/6/61
Ca137	1959	120 curies	"	UIM-1A source - Leak tested 3/6/61
Sr90	M6 source	28.9 mc	Lab T	TS-784 calibrator - Leak tested 1/11/61
"	"	30.1 mc	Rad. Lab.	" " 1/11/61
"	"	29.8 mc	Lab. T	" " 1/11/61
"	"	32.0 mc	Lab. T	" " 1/11/61
"	"	31.0 mc	Rad. Lab.	" " 1/11/61
"	"	31.5 mc	Lab. T	" " 1/11/61
"	"	27.8 mc	Rad. Lab.	" " 1/11/61
"	"	33.2 mc	Rad. Lab.	" " 1/11/61
"	"	33.7 mc	Lab. T	" " 1/11/61
"	"	28.4 mc	Lab. T	" " 1/11/61
"	"	28.4 mc	Rad. Lab.	" " 1/11/61
"	"	31.1 mc	Lab. T	" " 1/11/61
"	"	31.2 mc	Rad. Lab.	" " 1/11/61
"	"	26.7 mc		Leak test of 1/11/61 indicated leakage - source disposed 6/13/61
Sr90	M6 source	30.0 mc	Lab. T	TS-784 calibrator - leak tested 1/11/61
"	"	27.4 mc	Rad. Lab.	" " 1/11/61

Isotope	Date	Amount	Location	Remarks
Sr90	M6 source	33.4 mc	Rad. Lab.	Ts-784 calibrator - leak tested 1/11/61
"	"	30.0 mc	"	" " 1/11/61
"	"	31.6 mc	Lab. T	" " 1/11/61
"	"	31.3 mc	Lab. T	" " 1/11/61
"	"	29.2 mc		Leak tested 1/11/61 - indicated leakage - source disposed 6/13/61
Sr90	M6 source	28.7 mc	Lab. T	Ts-784 calibrator - Leak tested 1/11/61
"	"	30.0 mc	"	" " 1/11/61
"	"	32.4 mc	"	" " 1/11/61
"	"	30.6 mc	Rad. Lab.	" " 1/11/61
"	"	27.0 mc	"	" " 1/11/61
"	"	29.9 mc	"	" " 1/11/61
"	"	29.4 mc	Lab. T	" " 1/11/61
"	"	30.0 mc		Leak test of 1/11/61 indicated leakage - source disposed 6/13/61
Sr90	M6 source	31.5 mc	Lab. T	Ts-784 calibrator - Leak tested 1/11/61
Ra	6/15/48	24.4 mg	Disposed	6/13/61
"	10/19/57	106.2 mg	Vault	Leak tested 2/28/61
"	"	80.2 mg	"	" " "
"	9/19/47	48.2 mg	"	" " "
"	6/15/48	58.8 mg	"	" " "
"	"	24.0 mg	"	" " "
"	"	24.44 mg	"	" " "
"	7/23/47	24.52 mg	"	" " "
"	"	24.53 mg	"	" " "
"	6/15/48	20.53 mg	"	" " "
"	7/23/47	20.62 mg	"	" " "
"	7/23/47	24.71 mg	"	" " "
"	6/15/48	38.70 mg	"	" " "
"	9/19/47	48.00 mg		Leak test of 11/29/59 indicated leakage - disposed 6/13/61
"	9/19/47	95.9 mg	Vault	Leak tested 2/28/61
"	"	99.3 mg	"	" " "
"	10/19/49	101.9 mg	"	" " "
"	10/17/50	1.04 mg	"	" " "
"	2/17/50	1.05 mg	"	" " "
"	2/17/50	1.12 mg	"	" " "
Co60	10/56	1 mc	"	" " "
"	"	1 mc	"	" " "
RaBe	10/28/49	5 mg	"	" 2/27/61
CoBa	7/24/57	5 curies	Disposed	6/13/61
Co60	7/10/59	2.09 mh	Disposed	6/13/61
Co60	4/13/61	T-3 kit	Vault	
Co60	1957	194 mwhm	Vault	(Disposition authority requested)
UO	1/50	402	Disposed	6/13/61

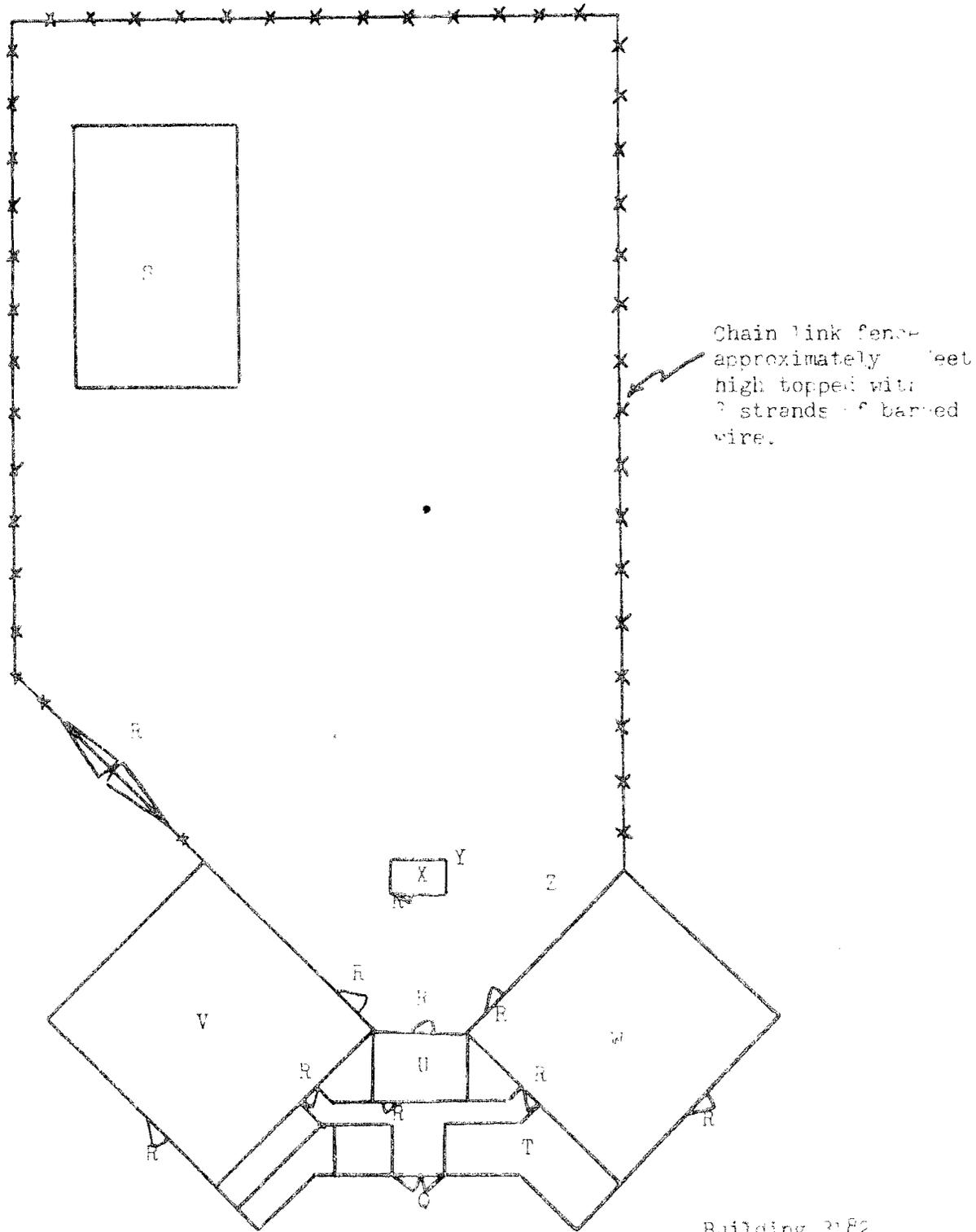
In addition to isotopes listed above the licensee possessed the following:

- Uranium - 50 sources Model M-3 of approximately 4000 d/m each stored at the Rad. Lab.
- Cobalt - 60 50 capsules - a total of 765.6 curies with the maximum in a single capsule 13.6 curies - stored within the Hot Cell
- Radium - 123 calibration sources of approximately 5 mg each for AN/PDR instruments
- Kr85 - 10 calibration sources of 80 microcuries each for AN/PDR 43 instruments
- Sr90 - 15 calibration sources of 100 microcuries each for AN/PDR 18A instruments
- U238 - 9 calibration sources of 0.01 microcurie each for AN/PDR 10B instruments
- Unknown - Stored in well 6 to 8 feet deep - well measures 5000 mr/hr with lead can off - believed to contain 50 to 100 curies of Cobalt-60
- Unknown - Stored in shielded vault - 155 mm artillery projector (unarmed) reading 17,000 mr/hr at contact - contents unknown.
- Unknown - Stored in 5-ton lead shield - reading 500 mr/hr at approximately 12 inches from the open top of the shield - contents unknown
- Cobalt-60 - 417 sealed sources ranging in size from 1 to 40 curies installed at Pelham Range field exercise area.

Licensee states the M7 and M3 uranium sources and the M6 Strontium-90 sources and the instrument calibration sources are not possessed under the license issued to the U.S. Army Chemical Corps School. Rather, possession is under the license issued to the Lexington Signal Depot and as item of Chemical Corps issue.

EXHIBIT A

Building 3182  
 Ft. McClellan, Alabama



Building 3182

- Q - Doors normally locked when building is unattended.
- R - Doors and gates normally locked except when the door or gate is in use.
- S - Hot cell building
- T - Instrument repair shop
- U - Instrument storage room
- V - Classroom
- W - Classroom; the UDM-1 and UDM-1A calibrators are in Classroom W
- X - Radioisotope storage vault
- Y - Location of well holding unknown radioisotopes
- Z - Location of preparation area for waste disposal

PHOTODUPLICATION LOCATOR

NAME: \_\_\_\_\_ DATE OF BIRTH: \_\_\_\_\_  
(PRINT) LAST FIRST MI DAY MONTH YEAR

RANK: \_\_\_\_\_ SERVICE NUMBER: \_\_\_\_\_

MILITARY MAILING ADDRESS:

PARENT UNIT: \_\_\_\_\_

STATION: \_\_\_\_\_

CLASS: \_\_\_\_\_ DATE: From: \_\_\_\_\_ To: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

This film badge is issued as a control against your overexposure to radiation.  
DO NOT TAMPER with it.

CMLC TNGCOM FORM 346 (Previous editions of this form are obsolete.)  
(28 Jun 60)

US ARMY CHEMICAL CORPS SCHOOL  
FORT McCLELLAN, ALABAMA

CMLTC-SDI-T

SUBJECT: Record of Exposure to Ionizing Radiation

TO: Commanding Officer

In accordance with paragraph 4a, AR 40-431, (BUMEDINST 6150.18) (AFR 160-31) dated 12 September 1956, record of exposure to ionizing radiation of the following named individual (s) is forwarded for inclusion in the individual health record DD Form 1141.

Type of Radiation:		Method of Measurement: Film Badge			
Name	Rank	Serial No.	Organization	Dose in r	Period

FOR THE COMMANDANT:

CMLC TNGCOM FL 303  
(21 Jul 59)  
Previous editions are obsolete

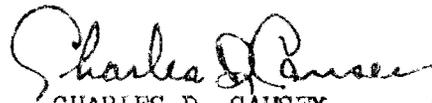
  
CHARLES D. CAUSEY  
Major, CMLC  
Secretary

EXHIBIT D

Records of Student Exposure  
U. S. Army Chemical Corps School  
Fort McClellan, Alabama

For the year 1961, the following shows the exposure, as shown in film badge records, for that student in each class receiving the highest exposure.

<u>Class</u>	<u>Dates (1961)</u>	<u>Maximum Exposure (Mrem)</u>
Redstone Arsenal CBR Teach	Aug. 7-12	28
ROTC Summer Camp	July 3-15	0
22d Chem. Co. CBR	July 13	0
3d Pathfinder	March 20-22	131
4th Pathfinder	May 8-9	120
4th Pathfinder	Aug. 7-8	42
5th Pathfinder	June 5-6	70
4th ACOCC	Jan. 16 - May 26	56
2d CORC	Aug. 7-18	22
3d CORC	June 5-19	57
2d Cml Staff Spec.	March 13-April 28	89
3d CSSC	May 8 - June 23	267
7th CBRE	Jan. 8 - Feb. 3	76
8th CBRE	Jan. 23 - Feb. 17	80
9th CBRE	Feb. 20 - March 17	95
10th CBRE	March 6-31	70
11th CBRE	April 3-28	66
12th CBRE	April 17 - May 13	66
13th CBRE	May 15 - June 10	88
2d Adv. Cml NCO	Jan. 30 - March 24	76
3d Cml Lab	Jan. 16 - March 10	71
4th CLC	April 3 - May 26	28
5th Cml Entry	Jan. 9 - March 3	95
6th CEC	Feb. 6 - March 1	225
8th CEC	April 17 - June 9	66
9th CEC	May 8 - June 30	41
10th CEC	May 22 - June 14	50
3d USARADCOM	May 15-19	0
4th Nucl Wpn Effects	March 13 - April 28	97
3d Radl Saf	Jan. 16-27	460*
4th Radl Saf	March 6-17	45
5th Radl Saf	April 24 - May 5	0
15th Cml Off. Career	Sep. 6(1960) - May 26	76
4th ACOCC	Jan. 16 - May	71
4th CBRO	Feb. 6 - March 3	66
5th CBRO	March 20 - 14 April	61
6th CBRO	May 1-26	70
4th COOC	April 17-June 9 & June 23	90
4th ABCD	Jan. 9 - Feb. 10	71
5th ABCD	Feb. 27 - April 7	53
6th ABCD	April 10 - May 19	95
7th ABCD	May 22 - June 30	66
3d Cml Off.	Jan. 16 - March 10	45
Assoc. Cml. Co. Off.	July 17 - Aug. 4	34
Adv. Assoc. Off.	July 17 - Aug. 4	25
1st ABCD	July 31	41
1st Nuclr. War Effects	June 12 - Aug. 31	0

\*A letter to the Commanding Officer of this individual stated the individual was to receive no additional ionizing radiation prior to April 1, 1961.

EXHIBIT E

# Office Memorandum • UNITED STATES GOVERNMENT

TO : Isotopes Extension Files

DATE: May 29, 1957

FROM : James W. Hitch *JWH*

SUBJECT: REPORT OF CAPTAIN CONER ON FINDINGS AT U.S. ARMY CHEMICAL CORPS SCHOOL,  
FORT MCCLELLAN, ALABAMA

Symbol: IEB:JWH

Captain Coner presented a very detailed review of his and Colonel MacMurray's visit to Fort McClellan on May 27 and 28. Captain Coner was not at all pleased with the general program as carried out at this installation.

He reported that over 3000 curies of cobalt were stored out in a survey range which was referred to as Pellam Field. These sources varied in millicurie content from a few hundred millicuries to several curies. Sources are encapsulated in a galvanized pipe and are stored underground when not in use as described in their application dated April 10, 1957. It was also learned that these sources are raised above ground for certain field maneuver operations and left there for several days. Captain Coner reported a quick check of this field to be better than 300 mr/hr. This area is approximately 1 mile x 1-1 $\frac{1}{2}$  miles and is located in a military reservation which is enclosed by a two strand barbed wire fence and, although posted with a triangular black and white sign with the word "Atom" at approximately every 50 yards, it was mutually agreed by those attending the meeting that the area was improperly secured against unauthorized entrance to this area.

Another field of contention was that of a burial ground which had been abandoned but still had a radiation level at certain points of approximately 50 mr/hr. This burial ground was again surrounded by a two strand barbed wire fence. However, there was a new housing site nearby and it was pointed out that this whole burial area would be an excellent place for children to want to play. This installation is endeavoring to establish a new burial ground and some effort is being made to clean up the old one. Captain Coner reported he recommended that all detectable contamination be removed. He also stated that he recommended they discontinue burial of radioactive materials and contaminated equipment and either ship to Dugway or Edgewood for proper disposal of byproduct waste.

Question was raised as to our requirements on sealing of their encapsulated sources. Captain Coner had a source capsule which appeared to satisfactorily meet our requirements. However, he stated he had recommended that a few of the previously encapsulated sources be encapsulated for contamination and leakage of byproduct material. He stated that there was some reluctance of

May 29, 1957

Fort McClellan personnel to make this test. He also reported that they had agreed to tag all encapsulated sources used at Fort McClellan for field operational purposes. It was also agreed that we needed additional information on encapsulation procedures to be carried out at Fort McClellan.

It was pointed out that we also need additional information concerning protection aspects of the hot cell, such as the amount of byproduct material to be handled at any one time and the estimated radiation levels outside the cell where personnel may be subject to exposure to the radiation.

It was also pointed out that we had been led to expect a revised "Standard Operating Procedure" from this installation and such had not yet been obtained. Captain Coner reported Fort McClellan personnel stated that such a SOP was in process of being drawn up and would be available in the immediate future.

It was pointed out that we needed an up-to-date listing of the radioisotope committee with the names of the individuals who would be responsible for this program, since Lt. Powell is to be replaced in the immediate future. It was also necessary that we have the qualifications of such personnel.

It was formally agreed that we would write a letter to Colonel Wood, Chairman of the Isotopes Committee through the Surgeon General's Office, U. S. Army, Washington 25, D.C., Attention: MEDCE, pointing out the information further needed to obtain their application for licensing. It was further agreed that we would wait approximately 10 days until Captain Coner and Colonel MacMurray could further evaluate their findings and advise us with a copy of their findings at Fort McClellan.

5-13-59

Harold L. Price, Director  
Division of Licensing and Regulation  
Washington

R. C. Blair, Manager  
Savannah River

DEPARTMENT OF THE ARMY, U. S. ARMY CHEMICAL CORPS SCHOOL, FORT  
MCLELLAN, ALABAMA - LICENSE NO. 1-2861-1K60

SYMBOL: N:GHD:bd:

Enclosed is one copy of an inspection report showing five items of noncompliance for the subject license.

The purpose of the School is to train service personnel in the various aspects of radiological defense. Licensed material as sealed sources is used in radiation monitoring instruction.

An active Isotopes Committee reviews all proposed new uses of licensed material but apparently leaves enforcement of established operating procedures to the Radiological Safety Officer. The RSO appears competent and extremely interested in his work and the noncompliance items are probably due to some laxity through long contact with an established program and, in some cases, through mitigating circumstances. The overall administrative control appears to be good. The noncompliance items were discussed at a meeting called for that purpose. Nine officers and two civilians were present and included Col. G. V. Burke, Commandant of the Chemical Corps School, Col. L. A. Parks, Assistant Commandant and Chairman of the Isotopes Committee, Lt. Col. N. I. Shpira, Chief, Radiological Branch, Technical Division, Lt. Conrad Knight, Radiological Safety Officer, Mr. Walter Ogar, Safety Director of the Training Command and Mr. G. L. Fezell, Safety Director of the U. S. Army Chemical Corps. Mr. Fezell is stationed in the Office of the Chief Chemical Officer in Washington and supervises the licensing program of the Chemical Corps.

The items of noncompliance discussed were: 20 curies of Cesium 137 totaling 7 curies - possession limit is 100 millicuries.

20 curies of Cesium 137 - Caution Signs - Details.

A fenced radioactive materials storage area requiring Radiation Area posting was improperly posted. (See paragraph 12(6) of Report Details). Allowed possession of 20 curies of Cesium 137. At the time application was made for the present license, the licensee intended to immediately dispose of all Cesium 137 on hand and therefore did not request an adequate possession limit. The Cesium 137 was not disposed of although some of the Cesium 137 on hand has been packaged as waste and is awaiting shipment (paragraph 15 of Report Details).

DISTRIBUTION:

Approved by:

[Signature]

MAY 11 1959

(Date report prepared)

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to format, leaving sufficient margin at top for binding. Identifying each item by number and noting "Continued" on the face of form in appropriate item.

RECOMMENDATIONS SHOULD BE SET FORTH IN A SEPARATE COVERING MEMORANDUM

SELF RECEIVED BY PERSONS  
OF THE VETERAN'S ADMINISTRATION

11. Continued

The major portion of licensed material is permanently installed as sealed Cobalt 60 sources in Pelham Range, a high radiation field used for field monitoring exercises. Two thirty curie and 408 seven curie sources are listed on the inventory maintained by Lt. Knight.

Byproduct material received in February 1959 was 10 millicuries each of Silver 111, Rubidium 83, Bismuth 210 and Phosphorus 32. These were the only small individual quantities of byproduct material ordered since 1952. One 7 curie sealed Cobalt 60 source was received in 1953 and is used in a shielded exposure device for instrument calibration.

One 130 millicurie Cobalt 60 source is used in open air exposures for instrument calibration.

12. Physical Facilities, Posting and Labeling

- (1) Pelham Range is a large tract of land near Fort McClellan used for various Chemical Corps field exercises and is completely surrounded by a three strand barbed wire fence posted with warnings against unauthorized entry.
- (2) One area of Pelham Range has been specially fenced for use as a practice area for field radiation monitoring. This special area is surrounded by a 4 foot hog wire fence topped by three strands of barbed wire and contains 410 permanently installed sealed Cobalt 60 sources. Although positioned in individual source wells that can be used for storage, the sources are ordinarily left in the up or exposed position. A road has been cleared around the source field fence, and the fence is posted with properly colored signs showing the radiation symbol and reading - Danger - High Radiation Area. The two locked entry gates to the source field are posted with 2 1/2 foot x 4-foot signs, magenta markings and yellow background, showing the radiation symbol and reading Danger - High Radiation Area - Keep Out. The source field was established in 1953 or 1954.
- (3) An old radioactive materials burial ground had been established in one section of the source field. The burial ground is posted Radioactive Burial Ground - Keep Out, red and black lettering on a white background. The three strand barbed wire fence surrounding the burial area is no longer intact. An inscribed granite "head-stone" in the burial ground reads: Danger - Radioisotope Burial Ground - U. S. Army Chemical Corps School - Closed July 1957 - Contents - Cobalt 60, 10 curies - Mercury 203, Tantalum 182 and Cadmium 115, one millicurie (each). The quantity of buried byproduct material is a "best guess" and not a measured quantity.
- (4) Two laboratories are in use in the main building of the School. Small sources used in instruction in the use of scalers are prepared in a regular laboratory fume hood in Room 35. This room is posted with Caution - Radioactive Materials signs while sources are being prepared. Room 36 contains a number of Berkeley scalers used for classroom instruction.

and in Building 3182 are used for calibration training exercises. Sources are placed in the center of these large open rooms and meters calibrated by students at several distances from the source.

## ANNEX I

Summary of Action on Recommendations made in  
Report of Radiation Protection Survey No. 2672R75-57, 27-28 May 1957  
by Inspecting Team, US Army Environmental Health Laboratories,  
Army Chemical Center, Maryland

Para 5a. All radioactive sealed sources are to be labelled as soon as practicable, either by tagging or stamping. It is anticipated that a visit to Oak Ridge will be accomplished in the very near future to finalize and coordinate methods of labeling. Information on label will include serial number, radiation caution symbol, curiage and date of curiage determination.

Para 5b. All source holders will be labeled in accordance with paragraph 20.203 of the AEC Regulations as soon as practicable. In the interim period, regulations as specified by the inspection group of the Environmental Health Laboratories will be complied with.

Para 5c. Upon completion of work required in 5a, above, an inventory on specific sources will be established in accordance with AEC Regulations. Current records are not wholly adequate in this regard.

Para 5d. Leakage tests have been conducted on all sealed radium sources and random sampling of all other sources has been accomplished as required. These tests have all shown negative results. Periodic 3 month inspections will be made and records of test results maintained.

Para 5e. Tentative plans have been drawn up for improved "Hot Cell" facilities and these will be discussed in detail with the AEC officials during our forthcoming visit with them. Any AEC specifications for an official standard design for "Hot Cell" facilities, will be incorporated insofar as budgetary limitations permit. During the interim period, the existing temporary "Hot Cell" with recommended modifications, will continue to be used for conducting required tests. Health Physics personnel will insure proper safety precautions for operations during this period.

Para 5f. Action has been accomplished.

Para 5g. All contaminated material not being used for training purposes has been decontaminated. Items of equipment being used principally for training purposes are kept in an area accessible only to authorized personnel and the area is conspicuously marked with warning signs.

Para 5h. The proposal to place a barbed wire enclosure around the radiation area within Pelham Field does not lend itself to our training requirements. The alternate proposal calling for a 7' chainlink fence is beyond our budgetary capabilities at this time. We plan to discuss this problem in detail with the AEC officials during our forthcoming visit.

Para 5i. Random samples have been removed from the Pelham Range area and checked for leakage. No sign of leakage or deterioration was evident. Random sampling for leakage will be made every 3 months and records of data maintained. It is planned that all the sources will be removed from Pelham Range and reincapsulated as soon as a proper design of capsule and facilities are made available.

Para 5j. Concur. Capsule design will be discussed with AEC officials during the forthcoming visit.

Para 5k. Action has been initiated for the preparation of a storage site and the procurement of material therefor. The design of the storage facility will meet AEC's specification on allowable dose rate levels. Furthermore, consideration is being given to improvement of present storage facilities as a temporary measure. The plans for storage facilities which are to be constructed in conjunction with our "hot cell" will be discussed during the forthcoming visit with AEC officials. This site is presently inaccessible to unauthorized persons.

Para 5l and para 5m. Decontamination processes are near completion (but require coordination with AEC for final completion.) Present radiation levels are less than 5 mr/hr. To accomplish decontamination to an acceptable level (less than 1 mr/hr) will require that a large amount of earth be removed and taken elsewhere. The most practicable solution appears to be to enlarge the new storage area at Pelham Range. The old contaminated area is being made as inaccessible as possible through the use of barbed wire (concertina) and marked.

Para 5n. Material is presently being procured for the fencing of the new burial ground. This project will be completed as soon as these materials are available. Markings as required by AEC will be provided after the erection of fencing. Temporary markings are in use at present.

Para 5o. Accomplished. A request for the continued use of the new burial ground site has been forwarded to OCCm10.

Para 5p. Plans have been made to have students wear two film badges on test occasions and for one set to be sent to Lexington Signal Depot for processing and the other set of badges to be processed at the US Army Chemical Corps School. The results will be correlated and used as a control on procedures and techniques.

Captain Archie L. Stamper - Member Associate Field Artillery Battery Officer Course The Artillery School, Fort Sill, Oklahoma (3 months)	1950
Eastern Kentucky State College (Chemistry and Mathematics)	B.S. 1947-1951
Associate Anti-Aircraft Artillery Battery Officer Course The Anti-Aircraft Artillery and Guided Missiles Center Fort Bliss, Texas (4 months)	1951
Photo Interpretation Course, The Intelligence School, Fort Riley, Kansas (3 months)	1952
Staff Chemical Officer, 1st Cavalry Division, Japan	1954-1955
University of Virginia (Physics)	M.S. 1955-1957
Instructor, Physics, U.S. Army Chemical Corps School, Fort McClellan, Alabama	July 1957

DEPARTMENT OF THE ARMY  
US ARMY CHEMICAL CENTER AND SCHOOL  
Fort McClellan, Alabama 36201

ATSCM-HP

18 May 1973

MINUTES OF RADIATION SAFETY COMMITTEE MEETING

1. GENERAL.

- a. Date: 17 May 73
- b. Time: 1300 hours
- c. Place: Main Conference Room, USACMLCS
- d. Members Present: COL Simonson, Asst Comdt, Chairman  
LTC Roark, DOI & Res Instr Dept  
LTC Hodges, Dir, Ofc of Log  
LTC Foster, Tech Gp  
MAJ Wickstrom, C, HPD, Secretary  
MAJ Hall, Rad Com  
LTJG Adler, NAVTRAU  
Mr. Daniel, Center Safety Manager
- e. Members Absent: MAJ Wagner, Radiologist, NAH
- f. Visitors: None
- g. Purpose: Regular Quarterly Meeting
- h. Authority: USACMLCS Memo 385-2

2. OLD BUSINESS.

a. Minutes of the Radiation Safety Committee Meeting of 20 March 1973 were approved as written.

b. Secretary's Report:

(1) Work on decontamination is now 99% complete. There are a few spots that still need cleaning up. The Hot Cell is complete. There is still some documentation to be done, which will be passed on to Mr. Daniel. The Engineers are working on the remaining 1%. This is waste that is being placed in the last of the 75 waste drums. They will be sealed tomorrow, with possibly one or two left open for any last-minute decontamination waste.

(2) After the inspectors were here and the inspection report was disseminated to DA level, Mr. Fagan of DALO-MAS-I stated that we should submit a license to cover the residual contamination. This was about

10 millicuries. The residual waste is located in the Hot Cell, the waste disposal tanks, and in the storage well that is filled with concrete. The request was submitted on 4 May 1973, with Mr. Daniel as project officer in the name of the Post Commander.

(3) We have requested that our three existing licenses be cancelled 24 June 1973. However, a TWX from DA indicates that they will not consider cancelling them until we tell them that no radioactive material remains, which will be approximately 25 May 73, after all radioactive items are shipped. We will TWX DA at that time and ask them to reconsider our termination of licenses.

3. NEW BUSINESS.

a. ENS William Wright was unanimously approved as a CAT II RSP.

b. The Naval Training Unit, Center Safety Manager, and Technical Group, members of the Committee, stated they felt that the Secretary of the Committee and SSG Truffa have done an outstanding job in the radiological decontamination and other Health Physics actions in preparation for the disestablishment of the USACMLCS.

c. The Committee voted to disestablish itself as presently constituted effective with the closing of the USACMLCS, 24 June 1973.

4. Meeting was adjourned at 1315 hours, 17 May 1973.

KATHY J. HEATH  
Recorder

CHARLES J. WICKSTROM  
MAJ, CmIC  
Secretary

RECOMMEND APPROVAL:

APPROVED:

EUGENE M. SIMONSON  
COL, CmIC  
Chairman

JACK VANDERBLEEK  
COL, CmIC  
Commandant

DISTRIBUTION:

Asst Comdt; DOI; DRI; C, HPD (3); C, Tech Gp; C, Rad Com; Dir, Ofc of Log; Radiologist, NAH; Cdr, Nav Tng U; Cen Saf Mgr.



DEPARTMENT OF THE ARMY  
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY Mr. Edge/lx/584-3502  
ABERDEEN PROVING GROUND, MARYLAND 21010

HSE-RH/WP

25 JUL 1977

SUBJECT: Radiation Protection Survey No. 43-0046-77, US Army School/  
Training Center, Fort McClellan, Alabama, 4-5 May 1977

Commander  
USA Training and Doctrine Command  
ATTN: ATMD  
Fort Monroe, VA 23651

Inclosed are five copies of subject report.

FOR THE COMMANDER:

1 Incl  
as

ROBERT T. WANGEMANN, Ph.D.  
LTC, MSC  
Director, Radiation and  
Environmental Sciences

CF:  
Cdr, HSC (HSPA-H)  
HQDA (DASG-HCH)  
Cdr, USAS/TC, Ft McClellan  
Cdr, MEDDAC, Ft McClellan  
C, USAEHA-Rgn Div South  
Supt, AHS (HSA-IHE)

RADIATION PROTECTION SURVEY NO. 43-0046-77  
US ARMY SCHOOL/TRAINING CENTER  
FORT McCLELLAN, ALABAMA  
4-5 MAY 1977



US ARMY  
ENVIRONMENTAL HYGIENE AGENCY  
ABERDEEN PROVING GROUND, MD 21010



HSE-RH/WP

DEPARTMENT OF THE ARMY  
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY  
ABERDEEN PROVING GROUND, MARYLAND 21010

25 JUL 1977

RADIATION PROTECTION SURVEY NO. 43-0046-77  
US ARMY SCHOOL/TRAINING CENTER  
FORT MCCLELLAN, ALABAMA  
4-5 MAY 1977

ABSTRACT

This survey was conducted to evaluate the presence and extent of any health hazards resulting from the use of ionizing radiation sources and to evaluate the overall radiation protection program. It was found that several health hazards and administrative deficiencies existed and that the overall radiation protection program was inadequate. A review of the findings indicated that significant problem areas were the need to:

- a. Establish a written Radiation Protection Program or Standing Operating Procedures outlining procedures for handling of radioactive materials and a radioactive material control point.
- b. Designate in writing an individual responsible for preparing and maintaining DD Forms 1141.
- c. Obtain suitable instrumentation for personnel monitoring after handling and use of the AN/UDM-6 radiac calibrator.
- d. Conduct surveys of the contaminated facility in accordance with Nuclear Regulatory Commission License conditions and local regulation requirements.
- e. Maintain records of surveys, inventory, statement of training for users of radiac calibrators and radioactive material disposal records.

Recommendations made by this Agency in 1974 for correction of inadequacies have not been implemented.



HSE-RH/WP

DEPARTMENT OF THE ARMY  
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY  
ABERDEEN PROVING GROUND, MARYLAND 21010

RADIATION PROTECTION SURVEY NO. 43-0046-77  
US ARMY SCHOOL/TRAINING CENTER  
FORT McCLELLAN, ALABAMA  
4-5 MAY 1977

1. AUTHORITY.

a. AR 700-52, Licensing and Control of Sources of Ionizing Radiation, 22 May 1968.

b. Letter, HSE-AT/WP, this Agency, 4 March 1977, subject: Revised Field Service, Third Quarter, FY 77.

2. REFERENCES.

a. AR 40-14, Control and Recording Procedures for Occupational Exposure to Ionizing Radiation, 20 May 1975.

b. TM 3-6665-203-10, Operator's Manual: Calibrator, Radiac, AN/UDM-6, 19 February 1969.

c. TM 11-6665-204-12, Operator and Organizational Maintenance Manual, Calibrators, Radiac TS-784/PD and TS-784A/PD, including Repair Parts and Special Tools List, 1 March 1973.

d. Ft McClellan Regulation 385-8, Safety, Residual Radiological Contamination Safety Program, 4 June 1973.

3. PURPOSE. The survey was performed to determine the presence and extent of any health hazards resulting from the use of ionizing radiation sources at Fort McClellan, AL. Further, it was made to evaluate the overall radiation protection program established for conformance with current directives for radiation protection.

4. GENERAL.

a. The survey was conducted during the period 4-5 May 1977 by Mr. Harris Edge, DAC; 1LT David Lee, MSC, and SFC Troy Blanton, USA, Health Physics Division, this Agency.

b. An entrance interview was held with Mr. William Wible, the RPO, USAS/TC, Ft McClellan, AL.

c. An exit briefing was held with COL Kenneth E. Kellogg, Director, DIO, and Mr. William Wible, RPO, USAS/TC.

d. The most recent survey of the overall radiation protection program at USAS/TC, by this Agency, was conducted during the period 4-6 June 1974.

e. A listing of abbreviations is included in the Appendix.

5. FINDINGS.

a. General.

(1) Mr. William Wible was designated in writing as the RPO for USAS/TC.

(2) An ARPO had not been designated in writing for USAS/TC.

(3) Mr. Vernon R. Nance, Maintenance Division, DIO, was certified as the RPO for the Radiac calibrators, TS-784, and the AN/UDM-6 by Lexington-Blue Grass Army Depot.

(4) An ARPO for the Radiac Calibrators, TS-784 was not trained and certified to supervise the use and calibration of the calibrators.

(5) At the time of the survey, there was no written USAS/TC radiation protection program or SOP outlining procedures for shipment and handling of radioactive materials, and establishing a radioactive material control point for USAS/TC.

(6) A written Radiation Safety Program for the Residual Radiological Contaminated Facility was available for review and was adequate for the intended purpose.

b. Personnel Dosimetry Program.

(1) All personnel observed to be occupationally exposed to ionizing radiation were not utilizing the Army film badge service.

(2) DD Forms 1141, Record of Occupational Exposure to Ionizing Radiation, were supposedly maintained in the individual's personnel file at the Civilian Personnel Office. A review of selected files indicated that:

(a) DD Forms 1141 for civilian personnel assigned to the Maintenance Division, DIO, had not been posted since September 1976. A review of DA Forms 3484, Photodosimetry Report, indicated no personnel exposures in excess of prescribed limits had occurred during this period.

(b) DD Forms 1141 were not reviewed and evaluated quarterly by the RPO, USAS/TC.

(c) An individual responsible for preparing and maintaining DD Forms 1141 had not been designated in writing.

(d) The civilian personnel medical files did not have locator cards indicating that DD Forms 1141 were kept in the civilian personnel files.

c. NRC Licensed Radioisotopes. A review of NRC License for possession and control of licensed radioactive materials and the contaminated facility at USAS/TC indicated that:

(1) The RPO, USAS/TC, was not performing semiannual surveys of the contaminated facility.

(2) The RPO, USAS/TC, did not have suitable instrumentation to support conditions described in the NRC license application (Ft McClellan Regulation 385-8, Residual Radiological Contamination Safety Program, 4 June 1973).

d. Standard Military Sources. Standard military sources were used and stored at Building 228, Maintenance Division, DIO. These sources included:

(1) One AN/UDM-6 (SN A1153). Records were available to indicate that this source was being leak-tested at the required 3-month interval. A leak-test label was attached to the source container.

(2) Two TS-784A/PD (SN 186A4176 and SN 189A4245). Records were available indicating that leak tests were performed on these sources at the required intervals.

(3) At the time of the survey, Maintenance Division, DIO, did not have suitable instrumentation available for personnel monitoring after use of the AN/UDM-6 calibrator source. However, the Chief of Maintenance Division, DIO, indicated that a suitable instrument had been ordered in November 1976.

e. Radioactive Commodity Management.

(1) Six Message Center clocks (NSN 6645-00-303-4948) had been stored in Building 256, Supply Division, DIO, awaiting disposal instructions. At the time of the survey, the RPO, USAS/TC, indicated that all radium-dial instruments had been disposed of as radioactive waste. However, the RPO did not have records of disposal or transfer.

(2) Twenty-one unserviceable luminous-dial compasses containing radium and tritium had been stored in Building 256, Supply Division, DIO. The RPO, USAS/TC, indicated that all unserviceable luminous-dial compasses containing

radioactive materials had been disposed of as radioactive waste. However, no records were on file at the time of the survey.

(3) Approximately 30 lensatic compasses, both obsolete radium-dial compasses and broken tritium-dial compasses, had been stored in Building 3181, USWAC Center and School. At the time of the survey, the RPO, USAS/TC, indicated that these instruments had been disposed of as radioactive waste. The RPO, USAS/TC, did not have disposal records on file.

f. Records, Reports, and Surveys.

(1) The RPO, USAS/TC, did not have inventory records for all radioactive materials.

(2) Survey records of commodity storage areas were not available at the time of the survey.

(3) A statement of training for users of the AN/UDM-6 radiac calibrator was not available at the time of the survey.

(4) The RPO, USAS/TC, did not maintain records for disposal of radioactive material.

6. CONCLUSION. A review of the finding indicated that several health hazards and administrative deficiencies resulting from the use of ionizing radiation sources at USAS/TC, Ft McClellan, existed. Recommendations are provided to ensure that the overall radiation protection program is conducted in accordance with current directives for radiation protection.

7. DISCUSSION. At the time of the survey, USAS/TC did not have a written radiation protection program or SOP directives outlining procedures for control of radioactive material as is necessary to minimize exposure of personnel and to prevent unauthorized possession of radioactive commodities in the USA Supply System. Control of radioactive commodities is in addition to accountability and must be applicable to all organizational elements that use a radioactive commodity item due to mission requirements. There were numerous repeat findings from previous surveys and no apparent improvement or effort to resolve previous violations had been attempted. There was a lack of necessary instrumentation for personnel monitoring and for surveying ionizing radiation sources located at USAS/TC.

8. RECOMMENDATIONS.

a. General.

(1) Designate in writing an ARPO for USAS/TC in accordance with paragraph 4e(5), AR 700-52.

(2) Designate in writing and obtain certification for an ARPO for use and supervision of TS-784A/PD as required by paragraph 9-3a, TM 11-6665-204-12.

(3) Establish a formal set of rules or SOP outlining procedures for shipment, safe handling, and control of radioactive materials located at USAS/TC in accordance with paragraph 4e(2) and paragraph 4(f), AR 700-52.

b. Personnel Dosimetry Program.

(1) The RPO, USAS/TC, and other members of his staff who are occupationally exposed to sources of ionizing radiation, should utilize the Army film badge service or obtain an appropriate personnel monitoring device in accordance with paragraph 7a, AR 40-14.

(2) The following recommendations are made regarding DD Forms 1141, Record of Occupational Exposure to Ionizing Radiation, which should be maintained in accordance with paragraph 7d, AR 40-14, and the instructions on the back of DD Form 1141.

(a) The RPO, USAS/TC, should review and evaluate DD Forms 1141 of each individual engaged in duties involving occupational exposure to ionizing radiation in accordance with paragraph 12, AR 40-14.

(b) An individual responsible for preparing and maintaining DD Forms 1141 should be designated in writing in accordance with paragraph 7d, AR 40-14.

(c) The DD Forms 1141, when maintained separately from the individual's health record or civilian employee medical file, should have a locator card placed in each record in accordance with paragraph 10, AR 40-14.

c. NRC License for Contaminated Facility.

(1) The RPO, USAS/TC, should conduct surveys of the contaminated facility in accordance with paragraph 5d, Ft McClellan Regulation 385-8.

(2) The RPO, USAS/TC, should obtain or have instant access to survey instruments suitable for detection of potentially contaminated areas and are capable of detecting the type and level of radiation emitted by the contaminated facility. Subject survey instruments are required by paragraph 5d, Ft McClellan Regulation 385-8.

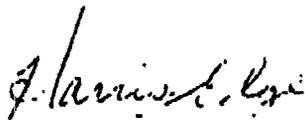
d. Standard Military Sources. Suitable instrumentation should be available for personnel monitoring after handling or using the AN/UDM-6 radiac calibrator in accordance with TM 3-6665-203-10.

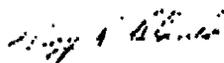
e. Records, Reports and Surveys.

(1) An inventory of all radiation sources at USAS/TC should be established and maintained by the RPO, USAS/TC, in accordance with paragraph 17, AR 700-52.

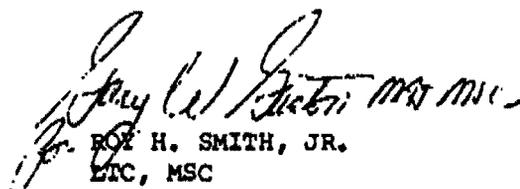
(2) Surveys of each area in which sources of ionizing radiation are used and stored should be performed by or under the direction of the RPO, USAS/TC, in accordance with paragraph 16, AR 700-52.

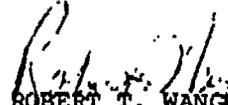
(3) The RPO should prepare a statement of training for each individual who is assigned the responsibility for use of the AN/UDM-6 radiac calibrator. This record should be placed in the individual's 201 file in accordance with paragraph 5c, TM 3-6665-203-10.

  
HARRIS EDGE  
Health Physicist  
Health Physics Division

  
TROY R. BLANTON  
SFC, USA  
Health Physics Division

APPROVED:

  
ROY H. SMITH, JR.  
LTC, MSC  
Chief, Health Physics Division

  
ROBERT T. WANGEMANN, Ph.D.  
LTC, MSC  
Director, Radiation and  
Environmental Sciences

**From:** <twilliams@adph.state.al.us>  
**To:** <omm@nrc.gov>  
**Date:** Mon, Feb 26, 2001 10:39 AM  
**Subject:** Hot Cell Well

Good morning,

I just talked to Greg Komp, former RSO at the Fort. He told me the well was about 15 feet deep and three foot across. It was constructed to contain piping from the hold tank at the hot cell. When it was destroyed, the contents were shipped to Barnwell, excesss concrete was surveyed and sent to a landfill and the well was filled in with dirt.

He told me this well was had about 2 feet above ground then covered with a tin top with access through the top. It wasn't a building. There was in fact another building in the area for storage. When it was torn down, it to was surveyed and removed.

Komp told me that John May had asked him a lot of these same questions and looked for the records of the surveys a couple of years ago. Guess May never could find them.

Komp said to call back anytime if we had other questions. In case you lost his number it is [REDACTED]. Have you been able to contact the person in Heflin, AL?

Radn Prot Surv No. 43-0046-77, USAS/TC, Ft McClellan, AL, 4-5 May 77

APPENDIX  
ABBREVIATIONS

ARPO	Alternate Radiation Protection Officer
DAC	Department of Army Civilian
DIO	Directorate of Industrial Operation
NRC	Nuclear Regulatory Commission
NSN	National Stock Number
RPO	Radiation Protection Officer
SN	Serial Number
SOP	Standing Operating Procedure
USAS/TC	USA School/Training Center
USWAC	US Women Army Corps