9

CAUTION!

100

RADIOACTIVE MATERIAL

ISOTOPE ^{3}H | ^{35}S

AMOUNT 325 μci | 425 μci

DATE 11/28/84 BY JFS

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

THIS TAG SUPPLIED AS A SERVICE OF

ATOMIC ACCESSORIES, INC.

VALLEY STREAM, N. Y.

WT-43

#3

Shipped 6/25/85

120

CAUTION!

RADIOACTIVE MATERIAL

ISOTOPE ^{14}C | ^{3}H | ^{35}S

AMOUNT 2950 μci | 750.4 μci | 150 μci

DATE 11/28/84 BY JFS

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

THIS TAG SUPPLIED AS A SERVICE OF

ATOMIC ACCESSORIES, INC.

VALLEY STREAM, N. Y.

WT-43

#6

CAUTION!

120

.5

.07

RADIOACTIVE MATERIAL

ISOTOPE ^{60}Co | ^{3}H | ^{35}S

AMOUNT 400 μci | 600 μci | 150 μci

DATE 11/28/84 BY JFS

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

THIS TAG SUPPLIED AS A SERVICE OF

ATOMIC ACCESSORIES, INC.

VALLEY STREAM, N. Y.

#7

CAUTION!

150

RADIOACTIVE MATERIAL

ISOTOPE ^{3}H | ^{14}C | ^{35}S

AMOUNT 300 μci | 300 μci | 40 μci

DATE 11/28/84 BY JFS

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

THIS TAG SUPPLIED AS A SERVICE OF

ATOMIC ACCESSORIES, INC.

VALLEY STREAM, N. Y.

#16

100 CAUTION!

RADIOACTIVE MATERIAL

ISOTOPE ^{3}H | ^{60}Co | ^{35}S | ^{14}C

AMOUNT <6.5 mci | <0.1 μci | <0.1 μci | 1.98 mci

DATE 2/24/86 BY [illegible]

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

THIS TAG SUPPLIED AS A SERVICE OF

ATOMIC ACCESSORIES, INC.

VALLEY STREAM, N.Y.

WT-43

#4

100 CAUTION!

RADIOACTIVE MATERIAL

ISOTOPE ^{14}C | ^{3}H

AMOUNT 35 μci | 95 μci

DATE 12/13/84 BY [illegible]

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

THIS TAG SUPPLIED AS A SERVICE OF

ATOMIC ACCESSORIES, INC.

VALLEY STREAM, N.Y.

WT-43

#12

100 CAUTION!

.07

.07

RADIOACTIVE MATERIAL

ISOTOPE U compounds | ^{3}H | ^{14}C

AMOUNT 311.1 μci | 750.05 mci | 620 μci

DATE 1/9/85 BY [illegible]

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

THIS TAG SUPPLIED AS A SERVICE OF

#1

120 CAUTION!

RADIOACTIVE MATERIAL

ISOTOPE ^{238}U | ^{14}C | ^{3}H | ^{35}S

AMOUNT 202 g 612 [illegible] | 8.84 mci | 202 mci | 40 μci

DATE 11/18/87 BY [illegible]

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

EMED CO INC
1716 626 1616

BARNWELL WASTE MANAGEMENT FACILITY

Operated by: CHEM-NUCLEAR SYSTEMS, INC.
P.O. Box 726, Barnwell, South Carolina 29812
(803) 259-1781
RADIOACTIVE SHIPMENT MANIFEST FORM

(1) GENERATOR NAME HQ, U.S. ARMY, AMCCOM
ADDRESS ATTN: AMSMC-SFS
NATICK Research Development and Engineering Center
CITY Rock Island STATE IL
CONTACT B. MORRIS PHONE 309-782-2964

(2) consigned to:
CHEM-NUCLEAR SYSTEMS, INC.
P.O. BOX 726; OSBORN ROAD
BARNWELL, S.C. 29812

(3) USE THIS NUMBER ON ALL CONTINUATION PAGES — VOLUME ALLOCATION NO. 0686-305-A — PAGE 1 OF 2

CARRIER CNSI ADDRESS Osborne Rd Snelling
TELEPHONE 803-259-1781 SHIPPING DATE 25 June 86
SHIPMENT TYPE UAN SHIPMENT SURFACE EXPOSURE 2 mR/hr
CASK IDENTIFICATION NO. USA1 NA 1
SHIPMENT NO. 86-2012B LINER SERIAL NO. NA
DRIVER SIGNATURE [illegible] DATE 25 June 86

[redacted]

(6) SHIPMENT TOTALS

DISPOSAL VOLUME (Cubic Feet)	TOTAL NO. OF PACKAGES	ACTIVITY (10CFR20.311) Millicuries. ALL ISOTOPES	TRITIUM	C-14	Tc-99	1-129	SOURCE (Pounds)
60	8	774.291	763.36	9.041	0	0	.4

(7) TOTAL SNM

ISOTOPE	GRAMS
U-233	0
U-235	0
TOTAL	0

(8) TOTAL PALLET VOLUME (CU.FT.) 0

(9) MINIMUM % FILL FOR STABILIZATION PROCESS NA

(10) WASTE DESCRIPTION uncompacted Lab Trash (Paper, Plastic, Glass, Rubber)

(11) PHYSICAL FORM/ SOLIDIFICATION AGENT SOLID

(12) CHEMICAL FORM AND NAME AND % OF CHELATING AGENT(S) OXIDES

(13) WASTE FORM CLASS: ☒ AU ☐ AS ☐ B ☐ C

(14) (X) Yes ( ) No THIS VEHICLE IS CONSIGNED EXCLUSIVE USE. LOADING AND UNLOADING MUST BE ACCOMPLISHED BY CONSIGNOR OR CONSIGNEE OR HIS DESIGNATED AGENT.

(15) IMPORTANT: "This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Signature [signature]
Company US Army Natick R, D + E Center Date 25 Jun 86

(16) "Certification is hereby made to the South Carolina Department of Health and Environmental Control that this shipment of low-level radioactive waste has been inspected in accordance with the requirements of South Carolina Radioactive Material License No. 097 as amended, and the Nuclear Regulatory Commission's License No. 12-13536-01 as amended, and the effective Barnwell Site Disposal Criteria within 48 hours prior to shipment, and further certification is made that the inspection revealed no items of non-compliance with all applicable laws, rules and regulations."

Date: 25 Jun 86 By: [signature]
Title and Organization Director, Safety + Rad. Protection
Telephone No. (617) 651 5200 US Army Natick RD+E Center

CNSI USE ONLY

☐ This material meets all license requirements.
☐ This material was disposed of in accordance with license.
☐ Discrepancy.

Date:
Authorized Signature Title

CUSTOMER'S COPY

Form No. CNS-201
(11-85)

SEE INSTRUCTIONS ON REVERSE SIDE FOR FILLING OUT THIS FORM

Arrival Date Arrival Survey No.
Date/Time Buried H.P. Initial
Trench No. Location Code
Waste Class. Code
Trench No. Location Code
Waste Class Code
Personnel Exposure

BARNWELL WASTE MANAGEMENT FACILITY

Operated by: CHEM-NUCLEAR SYSTEMS, INC.

GENERATOR NAME Natick Research Development and Engineering Center

CONTINUATION SHEET

USE THIS NUMBER ON ALL CONTINUATION PAGES — VOLUME ALLOCATION NO. 0686-[illegible]-A

(17) ITEM NO.	(18) RADIO-NUCLIDE EACH CONTAINER	(19) PERCENT OF ACTIVITY OR mCi OF EACH NUCLIDE	(20) ACTIVITY EACH CONTAINER (mCi)	(21) PHYSICAL FORM	(22) CHEMICAL FORM AND NAME & % OF CHELATING AGENT	(23) WASTE DESCRIPTION	(24) WASTE FORM CLASS	(25) SPECIAL NUCLEAR MATERIAL (grams)	(26) SOURCE MATERIAL (pounds)	DISPOSAL CONTAINER (27) CONTAINER WEIGHT (pounds)	(28) CONTAINER VOLUME (Cu.Ft.)	(29) CONTAINER TYPE	(30) RADIATION LEVELS CONTAINER SURFACE ☑mR/HR ☐R/HR	(30) (T.I.) 1 METER mR/HR	(31) CONTAMINATION CONTAINER SURFACE (DPM / 100cm2) Alpha Beta-Gamma	(32) FISSILE CLASS	(33) LABELS/ MARKINGS USED
N-12	H-3	750.05	750.67	Solid	OXIDES	UN COMPACTED Lab Trash	A-U	0	0	100	7.5	Steel drum	.07	.07	≤220 ≤2200	NA	Radioactive— LSA
	C-14	.62				(Paper, glass, plastic, rubber)											Radioactive—
N-6	Co 60	.4	1.15							120			.5	.07			Radioactive—
	H-3	.6															Radioactive—
	S-35	.150															Radioactive—
N-3	C-14	2.95	3.85							120			.07	.07			Radioactive—
	H-3	.75															Radioactive—
	S-35	.15															Radioactive—
N-7	H-3	3.02	3.36							150			.07	.07			Radioactive—
	C-14	.3															Radioactive—
	S-35	.04															Radioactive—
N-9	H-3	.325	.75							100			.07	.07			Radioactive—
	S-35	.425															Radioactive—
N-4	H-3	.095	.446														Radioactive—
	C-14	.351															Radioactive—
N-16	H-3	6.5	8.4811							180			.07	.07			Radioactive—
	C-14	1.98															Radioactive—
	S-35	.0001															Radioactive—
	Co-60	.001															Radioactive—
N-1	H-3	2.02	5.512						.4	120			.07	.07			Radioactive—
	C-14	2.84															Radioactive—
	S-35	.04															Radioactive—
	DU	.612															Radioactive—
																	Radioactive—
																	Radioactive—
																	Radioactive—
																	Radioactive—
																	Radioactive—
																	Radioactive—
8			774.219														Radioactive—
						PAGE TOTALS		0	.4	790	60			NA			Radioactive—

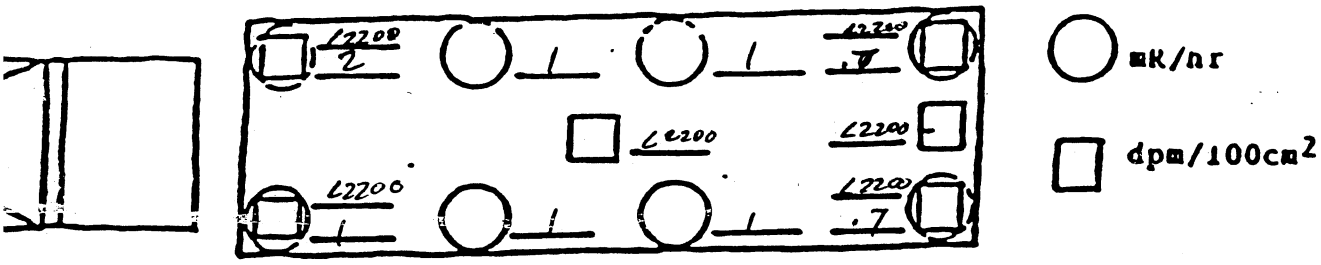
Form No. CNS-201 (11-85)

CUSTOMER'S COPY

Shipment Number 0686-305-A

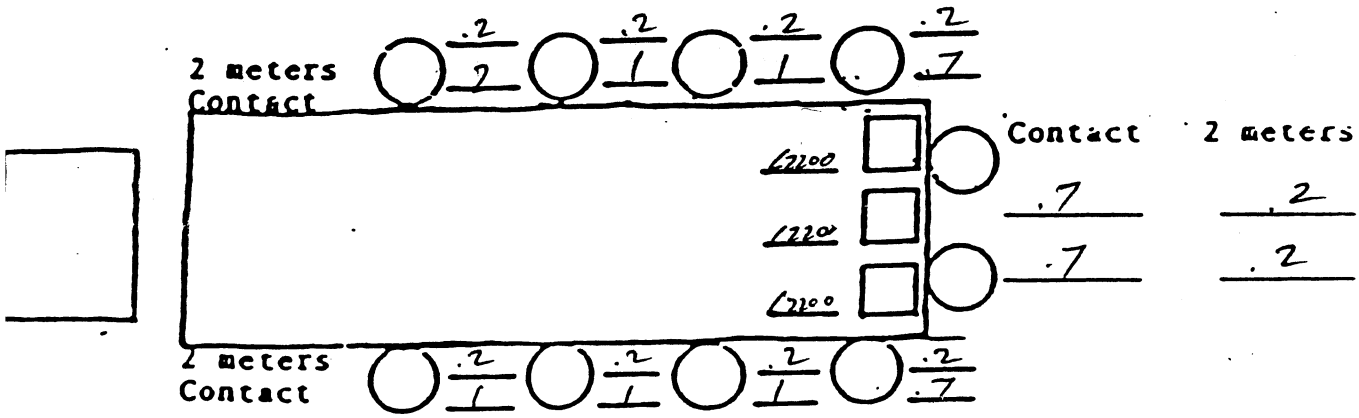
BROKER'S TRAILER SURVEY

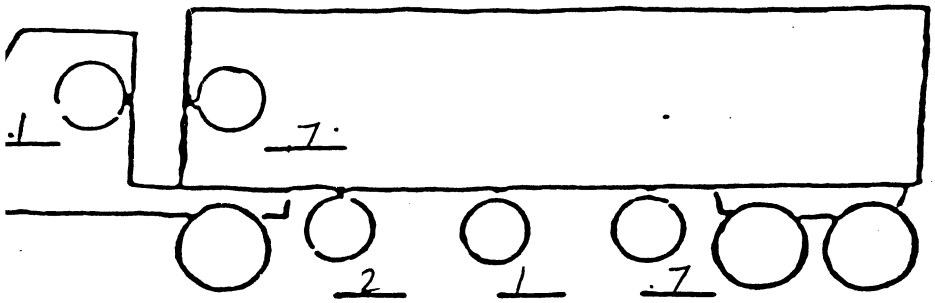
Initial Incoming Survey



Vehicle condition: Accept ✓; Reject ___

Outgoing Shipment Survey





Survey Performed by: D. Cornette

Instrument Used: [illegible]

CHEM–NUCLEAR SYSTEMS INC.

P.O. Box 726 • Barnwell, South Carolina 29812 • (803) 259-1781

STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — NOT NEGOTIABLE.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

The property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown). Marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination. If on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination. And as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the uniform domestic straight bill of lading set forth (1) in official, Southern, Western and Illinois Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment. Or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(MAIL OR STREET ADDRESS OF CONSIGNEE — FOR PURPOSES OF NOTIFICATION ONLY.)

Control Number: 86-2012 B

Tractor No. 40

Trailer No. 045

LENGTH: Legal

HEIGHT: Legal

WIDTH: Legal

FROM Natick Research Development and Engineering CENTER Date 25 June 86

At NATICK, Massachusetts

CONSIGNED TO Barnwell Waste Management Facility, CNSI

DESTINATION AMARC, Water Town Massachusetts STATE COUNTY

NO. PKGS.	HM	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, LINER NUMBERS, SPECIAL MARKS & EXCEPTIONS	*WEIGHT (Sub. to Correction)
72	X	Radioactive Material, Low Specific Activity, N.O.S., UN 2912	26151
		description: Scrap metal, OXIDES, Compacted Lab TRASH	
		Total Activity: 3910.379	
		Radionuclides: DU, H-3, C-14, Co-60, S-35	
		Physical form - solid chemical form: OXIDES	
		NON SPECIFICATION Marking - Radioactive - LSA	
		container: Strong tight	
		vehicle placarded - Radioactive	
		exclusive use vehicle - sealed	

IMPORTANT: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Signature [illegible]

Company CNSI Date 25 June 86

Received the property described above in good condition, except as otherwise noted.

Carrier

Driver

Date and Time

	DATE	TIME			DATE	TIME		SHIPPER'S SIGNATURE
SCHEDULED TO ARRIVE	[illegible]	1700	A.M. P.M.	COMPLETED LOADING	[illegible]	1100	A.M. P.M.	[illegible]
ARRIVED AT SHIPPER	[illegible]	[illegible]	A.M. P.M.	LEFT SHIPPER	[illegible]	1700	A.M. P.M.	[illegible]

SHIPPER IMPORTANT NOTE: Your signature certifies that the above dates and times are correct for record keeping and billing purposes.

FORM 205

Bam[redacted] 1*

U^{235}	2 g
^{14}C	1.551 mCi
^{14}C	.010
^{14}C	1.000
^{14}C	0.275
^{14}C	2.000
^{3}H	2.000
^{14}U	200.00 g
^{35}S	.040 mCi
^{3}H	.020

II

~~2*~~ $\bar{w}$ 1.2

^{14}C	0.200 mCi
^{14}C	1.000
^{3}H	.500
^{3}H	1.100
^{3}H	0.200
^{3}H	0.200

~~3* S~~

^{14}C	~~0.150~~
^{14}C	~~0.600~~
^{3}H	0.200
^{35}S	0.150
^{3}H	0.200
^{14}C	0.200
^{3}H	750.00 g
^{14}C	2.000

~~4*~~ $\bar{w}$ 1.2

^{14}C	0.700	^{35}S	0.150
^{3}H	0.200	^{35}S	1.2
^{3}H	3.5	^{3}H	1.0
^{3}H	8.09	^{14}C	0.2
^{3}H	3.00		
	2.00		
	3.00		

6* ~~[illegible]~~

^{60}Co	0.400 mCi
^{3}H	0.600
^{35}S	0.150

II

~~5*~~ $\bar{w}$ 1.2

^{14}C	.400
^{3}H	2.000
^{3}H	0.5

~~7~~ * w̄ leg

^{3}H	3 mCi
^{14}C	0.300
^{35}S	0.040
^{3}H	0.020

8 *

^{3}H	1.000
^{14}C	0.500
^{35}S	0.040
^{3}H	0.020

#3 ^{14}C = 950 μCi ✓
^{3}H = 575 μCi ✓
^{35}S = 150 μCi ✓

#1 ^{238}U = 202 g (612 μCi) ✓
^{14}C = 4.84 mCi
^{3}H = 202 mCi ✓
^{35}S = 40 μCi ✓

#6 ^{60}Co = 400 μCi
^{3}H = 600 μCi ✓
^{35}S = 150 μCi ✓

6# ^{3}H = 3.02 mCi ✓
^{14}C = 300 μCi ✓
^{35}S = 40 μCi ✓

#4 = ^{14}C = 351 μCi ✓
^{3}H = 951 μCi ✓

^{3}H 325 μCi ✓
^{35}S 425 μCi ✓

RUM

2869

~~Date~~	DATE	Name	Location	Nuclide		Amount	
#1	9-7-78	WERNER	R #138	I 125		10 mc	
#1	9-7-78	WERNER	R #138	I 125		175 mc	
#1	9-28-78	McCORMICK	D 312	14C		< 1 μci	
#1	10-3-78	LUSSIER	ARIEM R 247	H^3	C^{14}	2 mci	2 mci
#1	10-3-78	LUSSIER	ARIEM R 247	S^{35}		2 mCi	
#1	10-2-78	BOWERS	ARIEM	NAT U		200 GRAMS	
#2	11-22-78	RICHMOND F.S.L	F.S.L R 308	H^3		2. MC	
#2	1-5-79	LUSSIER A	ARIEM	H^3		40 μci	
#2	1-23-78	SIECKARSKI	H.P.	P^{32}		0.2 μci	✓
#3	2-28-79	LUSSIER	ARIEM	H^3		20 μci	✓
#3	3-8-79	ROWLEY	R-137	S^{35}		40 μci	
#3	3-8-79	ROWLEY	R-137	C^{14}		300 μci	
#3	3-8-79	ROWLEY	R-137	H^3		3 MC	✓
#H	3-13-79	NARAYAN	SEL R 120	H^3		750 μci	RATS
A	3-13-79	LUSSIER	ARIEM	S^{35}	~~S^{35}~~	4.8 mc	RAT ~~150 μci~~
R ~~ARD~~	3-13-79	LUSSIER	ARIEM	H^3	~~H^3~~	2.4 mc	RATS ~~200 μci~~
#4	5-15-79	LUSSIER	ARIEM	S^{35}		150 μci	✓
#4	5-15-79	LUSSIER	ARIEM	H^3		200 μci	
#5	7-13-79	LUSSIER/BUCKLIN	ARIEM	H^3	S^{35}	1 MC	1 MC
#4	7-13-79	McCORMICK	D 312	C^{14}		0.5 μci	
#4	7-13-79	McCORMICK	D 312	C^{14}		0.5 μci	
#7	10-30-79	BOWERS A	ARIEM	NAT U		300 GRAMS	
#7	8-2-79	ALPHATRON.		Ra^{226}		275 μGRAMS	
#7	8-2-79	~~ARIE~~ BOWERS	ARIEM	~~Ra 238~~ Uranium		150 GRAMS	(1 soln
#8	~~8-6-79~~	~~BOB LEE~~	~~R 138-140~~ 298.5	I^{125}		~~4.83 MC~~	
#8	8-4-79	BOWERS	RM 334 ARIEM	URANYL ACETATE	URANIUM	50 ml	100 ml
#11	10-17-79	NARAYAN	SEL R 120	C^{14}		280 μci	
#11	10-24-79	Bob Lee	FSL R138	I^{125}		2 Mc	

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
#1	9-7-78	WERNER R.138		I^{125} 3.07×10^{7} MMC	
#1	9-7-78	WERNER R 138		" 175 Mc I^{125}	
#1	9-28-78	McCORMICK D 312		14^{C} <1 μCi	
#1	10-3-78	LUSSIER A.	2880	3H 2Mci C14 2Mci S35 2Mci	
#1	10-30-78	Bowers Ariem	2862	Natural Uranium 300 GRAMS	
#2	11-22-78	RICHMOND FSL R305		2.0Mc TRITIUM	
#2	1-5-78	LUSSIER A ARIEM	2880	40 μCi 3H	
#2	1-23-79	Sieckarski	2753	0.2 μc P^{32}	
#3	2-28-79	Lussier - Ariem	~~2880~~ 2869	20 μci ^{3}H	
#3	3-8-79	POWLEY R-137	2321	40 μci 35S	
3	3-8-79	" "	"	C^{14} 300 μci	
3	3-8-79	" "	2321	H^{3} LESS THAN 3Mc	
	~~3-13-79~~	~~NARAYAN H-3~~	~~2495~~	~~H^{3} 750 μc~~	~~RATS/HARV~~
HARVARD	~~3-13-79~~	~~LUSSIER ARIEM~~		~~4.8Mc S^{35}~~	~~RATS "~~
	~~3-13-79~~	~~LUSSIER ARIEM~~		~~2.4Mc H^{3}~~	~~RATS~~
4	5-15-79	LUSSIER ARIEM		200 μci H3.	
4	5-15-79	LUSSIER ARIEM		150 μci 35-S	
~~6~~	~~6-11-79~~	~~LUSSIER ARIEM~~		~~22.5Mc S^{35} / 7.5Mc H^{3}~~	
~~6~~	~~7-12-79~~	~~LUSSIER ARIEM~~		~~A 3H-40μci B 3H 250μci S35 100μci~~	
~~6~~	~~7-12-79~~	~~LUSSIER "~~		~~C 3H 27μci S35 25μci~~	
5	7-12-79	BUCKLIN/LUSSIER "		1-3H-1Mc 1-35-1Mc	
4	7-13-79	McCORMICK 312	3	14c <0.5 μci	
4	7-13-79	McCORMICK 312		14c <0.5 μci	
7	10-30-78	Bowers Ariem	2842	Natural Uranium 300g	
7	8-2-79	Alphatron		Ra^{224} 27 μgrams	
7	8-2-79	Ariem - Bowers	2842	Ra^{228} 150g	
8	8-6-79	BOB Y. LEE 138-140		I^{125} 4.83Mc	
	~~4/9/80~~			~~I^{125} 4.5 mc.~~	

DRAFT

1v-6-14-13

	Date	Name	Location	EXT.	Nuclide	Amount
8	8-14-79	NARRAYAN SEL.	SEL.	2495	^{14}C ^{3}H	113mC 9mCi
9	8-14-79	NARRAYAN	SEL.	"	^{14}C	71 mCi
10	8-14-79	NARRAYAN	SEL.	"	^{14}C ^{3}H	276 mCi 17mCi
11	8-31-79	D. SLADDIN	WORCESTER MEMORIAL HOSP.		^{14}C ^{3}H	400 mCi 1.2m
5	9-26-79	DR. RICHMOND	" "		^{3}H	19.6m
12	10-26-79	D. SLADDIN	WORCESTER MEM. HOSP.		^{14}C ^{3}H	300 mCi 900p
14	11-5-79	MILES	R 247		^{3}H	
15	12-17-79	Siechanski	Rad Lab.	2753	^{14}C ^{3}H	750 pCi 0.09p
16	"	"	" "	"	^{14}C ^{3}H	0.014 pCi 0.033p
17	12-21-79	Bob Lee	FSL 138		^{125}I	99 pCi
14	1-17-80	BOB LEE - CAPT WILSON	R-138-140	2900	^{125}I	200 mCi
13	3-5-80	" " Capt Wilson	R 138-140	2900	^{125}I	500 pCi
15	4/1/80	Baker (Sgt)	ARIEM	2880	^{14}C ^{35}S ^{3}H	11.874 mCi
15	4/28/80	McCormack	FSL		^{14}C	4.00 mCi
16	5/5/80	Bowers	ARIEM		Nat U	1.0 g
16	5/12/80	Narayan	FSL		^{14}C	500 μCi
	6/9/80	Francesconi	Ariem 244	2877	^{125}I	0.5 μCi
	6/10/80	Bowley	FSL D. 115	2383	^{14}C	1.551 mCi
	8/1/80	Bob Lee (Wilson	FSL 138	2900	^{125}I	200 mCi
	9-1980	Francesconi	Ariem 244	2877	^{125}I	5 pCi
16	10-7-80	McCormick	FSL 912	2405	^{14}C	410 pCi
	11-13-80	Francesconi	Ariem 244	2877	^{125}I	11.1 pCi
	11-9-80	Siechanski-Baker	Ariem 247	2880	^{3}H	4 mCi
	12-12-80	Capt Wilson	FSL 138	2900	^{125}I	200 pCi Sold
	12-80	Maj. Brown	Ariem 273		^{14}C	1.5 mCi
	12-23-80	Capt Trusom	Ariem 30	2861	Nat. U	125 g
	1/1/81	Capt Wilson	FSL 138	2900	^{125}I	200 pCi
	1-9-81	Capt Wilson	FSL 138	2900	^{125}I	5 pCi

Rad. Waste Log

2495

Drum #	Date	Name or Lab	Ext.	Isotope + Amount		[illegible]
A	3/26/81	Kaplan - McCormick 312	2983	^{14}C	[illegible]	<9 μci
B	"	" " "		^{14}C	<[illegible] μci	
	3/31/81	Cpt Wilson - R. 138	2900	^{125}I	200 μci	100 μci 7-2-8[illegible]
A	4-6-81	Dr. Rowley - D-115	2454	^{14}C	144 μci	
→	4-8-81	Francesconi - A 244	2877	^{125}I	1.04 - 1.42	3-26-81 4-8-81 μci
	4-10-81	Dr Bowers A 341	2862	Nat. U		
C	4-15-81	Baker A-247	2880	^{3}H	10 μci	
	4-16-81	" A-247	2880	^{3}H	9.28 μci	
	5-14-81	Lim - R-112	2454	^{125}I	200 μci	201 μci 7-1-82
→	6-5-81	Francesconi A-244	2877	^{125}I	7.2 μci	
	6-12-81	CPT. Trusal A-301	2861	axial acetate	250 mg	01 50cc
	7-3-81	I^{125} R-112	2454	^{125}I	46 μc	
	8-17-81	I^{125} A-244	2877	^{125}I	4.67 + 1.65 μci	
	10-28-81	I^{125} A-244	4877	^{125}I	2.2 μci	
	10-29-81	I^{125} A-247	4877	^{125}I	7.7 μci	
	10-29-81	I^{125} A-247	4877	^{125}I		
A	2-18-82	[illegible] Narcyttic		C^{14}	150 μci	✓
B	"			C^{14}	25 μci	✓
C	"		~~3 μci~~	C^{14}	2100 μci	✓ H^3 7700 μci
			3 μci ^{14}C	C^{14}	25 μci	Bottom Solid
C	7-18-82	Rad Lab - 106 A		H^3	250 μci	500 μci
	5-27-81	Francesconi		^{125}I	11.12 μci	7.9 6-30-82
				^{125}I	3.26 μci	5-27-82
	6-4-82	Francesconi		^{125}I	52 μci	6-4-82
	7-16-82	Francesconi		^{125}I	2.77 μci	7-16-82
	"	"			1.53 μci	"
	8-4-82	Sue K	4879	^{125}I	81 μci	8-18-82
	8-18-82	Lea		^{125}I	1.77 μci	8-18-82

958-161	3H	.75 mci
640-281	3H	.25 "
590-194	3H	.25 "
1105-081	3H	1.0 mci
1105-081	3H	1.0 mci
1130-202	3H	.05 mci
1130-202	3H	.20 mci
040-557	35S	2.5 mci
1108-023	3H	.20 mci
154-371	35S	5.0 mci
934-021	14C	.25 mci
796-059	14C	.05 mci
641-238	3H	.05 mci
856-156	14C	.05 mci
622-054	3H	.25 mci
847-186	14C	.02 mci
823-028	14C	4×10^{-5} mci (.04 uci)
889-051	14C	5×10^{-4} mci (.5 uci)
K-00245	3H	1.8×10^{-3} mci (1.8 uci)
K-00245	3H	9×10^{-6} mci (.009 uci)
K00245	3H	1.8×10^{-3} mci (1.8 uci)

11.87± mci.

S-35	7.5 mci	$< 4.5 \times 10^{-3}$ μci	< .001 mci	Solid
14C	170.54 μci	< .001 mci/ml		
3H	4.6036 mci	< .001 mci/ml	100 μci	Solid
14C	250 μci			Solid
14C	3.6 mci	< .003 μci/ml	200 μci	Solid
14C	1 mci			Solid
3H	1 mci			Solid
3H	10 mci	14 μci/ml	100 μci	Solid

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope	+ Amount	Remarks
	9-23-82	Leva	4879	2.3 μci	^{125}I	
	"	"	4877	10.7 μci	^{125}I	
	9-24-82	Suek	4879		^{125}I	9.76
			"	I^{125}	1.9 μci	
			"	I^{125}	1.65 μci	
	11-2-82	Leva	4877	4.22 μci	I^{125}	
				2 μci	I^{125}	
	12-2-82	Leva	4877	2.7 μci	I^{125}	
				1.3 μci	"	
				1.0 μci	"	
	12-3-82	Suki	4879	1.7 μci	I^{125}	
				1.1 μci	I^{125}	
	1-12-83	Ebert		<.21 μci	I^{125}	
				5.2 μci	I^{125}	
	1-13-83		4758	≤ 380 μci	I^{125}	Drum C
	1-13-83	Ebert		3.91 μci	I^{125}	Drain
	1-17-83	"		6.9 μci	"	Drain
	1-18-83	"		8.1 μci	"	Drain
	1-18-83	Lussier		4 μci	^{3}H	vials
	1-27-83	Bernstein				
		Statiamaster.		<1.0×10⁻⁷ μci	Po^{210}	Solid waste
		10 units Dated 73-75				one unit at a Time
	1-31-83	Leva	4877	2.5 μci	I^{125}	
				2.05 μci	"	
				2.2 μci	"	
	1-31-83	Siechanski		.001		Drain.
	2-3-83	Leva	4877	1.54 μci	^{125}I	

Rad. Waste Log

Drum #	Date	Name or Lab		Ext.	Isotope + Amount		Remarks
	3-10-83	Kaplan D.	D-320	4983	^{14}C - soil -	13.5 μci	
	4-28-83	Leva		4877	^{125}I	3.2 μci	Solid waste
	5-10-83	Kaplan	D-320	4983	^{14}C	< 5 μci	Barrel
	5-29-83	"	" "	4983	^{14}C	0.1 μci	Barrel
	7-7-83	Ebert		[illegible]	^{125}I	3.5 μci	Solid waste
	7-8-83	Ebert		"	^{125}I	7.5 μci	" "
	7-15-83	Ebert		4758	^{125}I	8.55 μci	Solid waste
	7/15/83	Sieckanski	Bldg. 30	4758	Mixed - Nuclides	Co, Cs, Ni .127 μci	[illegible] - Drain
	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
		"	[illegible]		[illegible]	[illegible]	[illegible]
	8/7/83	Leva		4877	^{125}I	1.6 μci	Solid waste
	9-15-83	Ebert	D-320	4758	^{125}I	.18 μci	Drain
	9-15-83	"	"	"	"	1.63 μci	"
	9-15-83	Ebert	D-320	4758	^{125}I	2.87 μci	Drain
	11-7-83	Ebert	D-320	4758	^{125}I	4.4 μci	Drain
	12-6-83	Feccia	A-247		^{35}S	[illegible] .174	Drain
	"	"	"		^{35}S	.174 μci	"
	12-6-83	Feccia	A-247		^{35}S	.174 μci	Drain
	12-6-83	"	A-247		^{125}I	.44 μci	"
	"	"	"		"	.549 μci	"
	12-6-83	Feccia	A-247		^{125}I	"	"
	12-6-83	Feccia	A-247		^{125}I	.549 μci	Drain
	12-7-83	Feccia	A-247		^{3}H	1 mci	Drain *
	12-8-83	Feccia	A-247		^{3}H	1 mci	Drain "
	12-9-83	Feccia	A-247		^{3}H	1 mci	Drain "
	12-12-83	Feccia	A-247		^{3}H	1 mci	Drain
	12-13-83	"	A-247		^{3}H	1 mci	Drain
	12-14-83	"	A-247		^{3}H	1.806 mci	Drain

* Diluted < 20.83 μci/cl. - 5 min

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount		Remarks
1	12-3-83	Leva	4877	125 I	2.5 μci	Solid Waste
d	"	"	"	"	0.8 μci	" "
	1-18-84	Ebert	4758	125 I	7.1 μci	Solid Waste
	1-27-84	Ebert	4758	125 I	6.8 μci	Drain
	2-7-84	Fead	5149	125 I	6.25 μci	Solid Waste
	2-15-84	Fead	5149	125 I	6.75 μci	Solid Waste
	2-22-84	Ebert	4758	125 I	9.8 μci	Drain <.001 μci/ml
	2-23-84	Ebert	4758	125 I	7.82 μci	Drain <.001 μci/ml
	2-24-84	Ebert	4758	125 I	<7 μci	Drain <.001 μci/ml
	2-29-84	Dunc II	4872	125 I	<9.35 μci	Drain <.001 μci/ml
	3-7-84	Ebert	4758	125 I	8.72 μci	Solid Waste
	3-9-84	Ebert	4758	125 I	9.09 μci	Solid Waste
	4-3-84	Leva	4877	125 I	1.5 μci	Solid Waste
	"	"	"	"	1.3 μci	" "
	"	"	4877	125 I	1.4 μci	Solid Waste
	4-24-84	Durhot	4758	125 I	7.5 μci	Drain <.001 μci/ml
	4-27-84	Durhot	4758	125 I	10 μci + 10 μci	Drain <.001 μci/ml
	5-12-84	Ebert	4758	125 I	<9.25 μci	Drain <.001 μci/ml
	5-21-84	Dubose	4874	125 I	<5.45 μci	Solid Waste
	5-21-84	Dubose	4874	125 I	<1.0 μci	Drain <.001 μci/ml
	5-23-84	Dubose	4874	125 I	<1.0 μci	Solid Waste
	5-23-84	Ebert	4758	125 I	8.7	Solid Waste
	5-24-84	Dubose	4874	125 I	<5.0 μci	Drain <.001 μci/ml
	5-25-84	Dubose	4874	125 I	<5.5 μci	Drain <.001 μci/ml
	5-31-84	Dubose	4874	125 I	8.2 μci	Drain <.001 μci/ml
	5-31-84	Ebert	4758	125 I	8.83 μci	Solid Waste
	6-1-84	Leva	4877	125 I	1.6 μci	Solid Waste
	6-5-84	Dubose	4874	125 I	7.43 μci	Drain <.001 μci/ml
	6-5-84	Szechanski	4758	60 Co	<.0022 μci	Drain <.001 μci/ml

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope	Amount	Remarks
1	6-8-84	Leva	4877	125 I	0.3 μci	Solid Waste
	6-13-84	Duboise	4874	125 I	6.8 μci	Drain
	6-15-84	Dunhot	4758	3 H	1.0 μci	Drain
	6-15-84	Dunhot	4758	14 C	0.5 μci	Drain
	6-18-84	Dunhot	4758	125 I	<10 μci	Drain <.001 μci/ml
	6-27-84	Dunhot	4872	3 H 14 C	0.81 μci	Solid
	"	"	"	3 H 14 C	1.04 μci	"
	7-3-84	Siechanski	4758	125 I	<9 μci	Drain <.001 μci/ml
	7-9-84	"	"	125 I	<9 μci	Drain <.001 μci/ml
	7-9-84	Leva	4877	125 I	0.74 μci	Solid waste
	7-9-84	Leva	4877	125 I	9.62 μci	Solid waste
	7-9-84	Duboise	4874	125 I	9.66 μci	Drain <.001 μci/ml
	7-11-84	Duboise	4874	125 I	9.56 μci	Drain <.001 μci/ml
	8-1-84	Duboise	4874	125 I	3.83 μci	Drain <.001 μci/ml
	8-7-84	"		125 I	3.41 μci	Drain <.001 μci/ml
	8-7-84	Leva	4877	125 I	<1.0 μci	Solid waste
	8-7-84	Duboise	4874	125 I	2.16 μci	Drain <.001 μci/ml
	9-24-84	Duboise	4874	125 I	2.25 μci	Drain <.001 μci/ml
	9-24-84	Plummer	4935	125 I	799 μci	Drain <.001 μci/ml
	9-25-84	Dunhot	4758	125 I	3.7 μci	Drain <.001 μci/ml
	9-26-84	Dunhot	4758	14 C	150 μci	Diluted Drain 0.25 μci/ml
	9-27-84	Dunhot	4758	3 H	200 μci	Diluted Drain 0.5 μci/ml
	10-4-84	Dunhot	4934	125 I	3.75 μci	Diluted <.001 μci/ml. Solid waste
	10-12-84	Dubois	4877	125 I	9.29 μci	
	10-11-84	Leva	4877	125 I	< 2 μci	Solid waste
	10-23-84	Dubois	4874	111 C	4.05	<.001 μci/ml
	11-7-84	Dubois	4874	125 I	3.68 μci	<.001 μci/ml
	11-20-84	Bowers		U.	0.02 μci	<.001 μci/ml
	11-20-84					

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount		Remarks
	12-5-84	Dunkel	4928	125 I	= .002 μci	Drain <.001 μci/ml
	12-13-84	Leva	4877	125 I	500 μci - 80	Solid <.001 μci
	12-18-84	Dunkel	4928	125 I	.002 μci	Drain <.001 μci/ml
	12-28-84	Faresse	4880	125 I	: 4.0 μci	Solid
	12-28-84	Young	4880	125 I	: 2.7 μci	"
	1-7-85	Trad	4880	125 I	~ 4.0 μci	Solid
	1-7-85	"	"	125 I	~ 1.8 μci	"
	1-7-85	Trad	4880	125 I	~ 1.8 μci	Solid
	1-7-85	Wilson		125 I		Solid
	"	Francescone	4877	125 I		<.001 μci
	"	"	4877	125 I		"
	"	Wilson		125 I		"
	1-7-85	Wilson		125 I		<.001 μci
	1-7-85	Wilson		125 I		<.001 μci
	2-18-85	Dunkel	4928	125 I	9.59 μci	Solid
	3-21-85	Leva	4877	125 I	5.8 μci	Solid
	5/10/85	Dubose	4874	125 I	5.44 μci	Solid
	5/10/85	Dubose	4874	125 I	<1.0 μci	Solid
	5					
	5					
	5/11/85	Dubose	4874	125 I	10 μci	<.001 μci/ml
	5/12/85	"	"	"	"	"
	5/15/85	"	"	"	"	"
	5/16/85	"	"	"	"	"
	5/17/85	"	"	"	"	"
	5/18/85	"	"	"	"	"
	5/19/85	Dubose	4874	125 I	10 μci	<.001 μci/ml
	5/20/85	"	4874	125 I (10.62)	9.04 μci	<.001 μci/ml
	5/20/85	"	4874	125 I		Solid <10 μci

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope	+ Amount	~~Remarks~~
	5-14-85	Dubose	4874	^{125}I	<.55 μci	Drain <.001 μci/ml
	5-14-85	Dubose	4874	^{125}I	<1 μci	Solid
16	5-21-85	Browers	4874	U	8.25 μci	Solid
	5-30-85	Dubose	4874	^{125}I	.025 μci	Solid
do	5-30-85	~~Dubose~~ Dunkel	4874	$^{3}H + ^{14}C$	.025 μci	Solid
16	6-24-85	Dunkel	4928	$^{3}H + ^{14}C$	10 μci	Solid
	7-1-85	Leva	4877	^{125}I	5 μci	Solid
	"	"	"	^{125}I	<1 μci	"
	"	"	"	^{125}I	8 μci	"
	"	"	"	^{125}I	1 μci	"
	"	"	"	"	1 μci	"
	7-1-85	Leva	4877	^{125}I	2 μci	Solid
	7-1-85	"	"	^{125}I	6 μci	"
	7/12/85	Cpt Kramer	4879	^{125}I	2 μci	Solid
	7/26/85	Cpt Kramer	4879	^{125}I	1.2 μci	Solid
	8/2/85	Leva	4877	^{125}I	5 μci	Solid
	8/2/85	"	"	"	3 μci	Solid
	8/15/85	Woodbury	4985	^{125}I	6.67	Drain <.001 μci/ml
	9/24/85	Kramer	4879	^{125}I	7.5 μci	Solid
	9-30/85	Elec. Shop		^{210}Po	5.96×10^{-12} μci	Solid waste
	10-1-85	Baker	2880	^{35}S	7.5 mci <4.5×10^{-3}	Drain
	10-2-85	Baker	"	^{14}C	170.54 μci	<.001 μci/ml Drain
	10-4-85	Baker	"	^{3}H	<4.1 mci	<.001 μci/ml Drain
	10-4-85	Baker	"	^{3}H	100 μci	Solid
	10-7-85	"	"	^{14}C	280 μci	Solid
	10-7-85	Baker	"	^{35}S	<.001 μci	Solid

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope +	Amount	Remarks
1	10-9-85	Cpt. Barr		^{14}C	3.6 mci	<[illegible]
14	10-9-85	" "		^{14}C	200 μci	Solid
14	10-11-85	Cpt Barr		^{14}C	1 mci	Solid
14	10-11-85	" "		^{3}H	1 mci	Solid
[illegible]	10-14-85	Cpt Barr		^{3}H	10 mci	^{14}[illegible]
[illegible]	10-14-85	Cpt Barr		^{3}H	100 μci	Solid
	11-21-85	Cpt Kraemer	4879	^{125}I	1.0 μci	Solid
	"	" "		^{125}I	0.25 μci	Solid
8	12-5-85	Dubose	4874	^{3}H	25 μci	Liquid Vial
8	12-5-85	"	"	^{3}H	25 μci	Solid
9	12-6-85	Dubose	"	^{3}H	25 μci	Solid
12-9-85	[illegible]	"	4874	^{3}H	25 μci	Liquid Vial
8	12-10-85	Dubose	"	^{3}H	25 μci	Solid
8	12-12-85	Dubose	"	^{3}H	25 μci	Liquid Vial
	12-20-85	Kraemer	4879	^{125}I	4.8 μci	Solid
		"	"	^{125}I	4.8 μci	Solid
14	12-1-85	Dubose	4874	^{3}H	25 μci	Solid
	1-28-86	Kraemer	4879	^{125}I	1.36 μci	Solid
	2-13-86	Leva (57)	4877	^{125}I	2.8 μci	Solid
	"	" (56)	"	"	2.8 μci	"
	"	" 61	"	"	1.5 μci	"
	"	" 60	"	"	2.0 μci	"
	"	" 63	"	"	1.5 μci	"
	"	" 59	"	"	2.0 μci	"
	2-13-86	Leva (62)	4877	"	1.5 μci	Solid
14	1-10-86	Dubose	4864	^{3}H	25 μci	Solid
8	12-12-85	"	4874	^{3}H	25 μci	Vial
	12-9-85	"	"	^{3}H	25 μci	"
	12-12-85	"	4874	^{3}H	25 μci	"

A577998

Packard

	DISCRIMINATORS	% GAIN	PRESET COUNT	BACKGROUND SUBTRACTION	LOW LEVEL REJECT	COUNTS
RED	L ____ U ____	____	____	____	____	____
GREEN	L ____ U ____	____	____	____	____	CYCLES ____
	^{3}H	^{14}C	^{32}P	$^{3}H/^{14}C$	$^{3}H/^{32}P$	$^{14}C/^{32}P$

DATE 18 Oct 84 SHEET ____ of ____

EXP'T EFF. 80%

NAME Waste Barrels

A.E.S. RATIO	SAMPLE NUMBER	TIME MINUTES	GROSS COUNTS AND % STD. DEV. RED		GROSS COUNTS AND % STD. DEV. GREEN		NET CPM RED	NET CPM CPM ~~GREEN~~	CHANNELS RATIO DPM ~~GREEN~~/RED	REMARKS
Outside #4	100	10.00	523	5.0			52.3	N.D.A		
Inside	10.	10.00	1153	4.0			115.3	61.5	76.88	
Bottom	102	10.00	3955	3.0			395.5	341.7	427.12	
Outside #7	10	10.00	553	5.0			55.3	1.5	1.88	
Inside	10.	10.00	808	5.0			80.8	27.0	33.75	
Bottom	105	10.00	754	5.0			75.4	21.6	27.0	
Outside #5	106	10.00	637	5.0			63.7	9.9	12.38	
Inside	107	10.00	748	5.0			74.8	21.0	26.25	
Bottom Liquid	108	10.00	53672	.5			5367.2	5313.4	6641.75	
Plastic	10.	10.00	803	5.0			80.3	26.5	33.12	
Outside #2	110	10.00	592	9.9			59.2	5.4	6.75	
Inside	11.	10.00	720	5.0			72.0	18.2	22.75	
Bottom	112	10.00	544	5.0			54.4	0.6	0.75	
Background	113	10.00	554	5.0			55.4	53.8		
	114	10.00	560	5.0			56.0			
	115	10.00	500	5.0			50.0			

TO REORDER, SPECIFY PACKARD CATALOG NO. [illegible]

Packard

	DISCRIMINATORS	% GAIN	PRESET COUNT	BACKGROUND SUBTRACTION	LOW LEVEL REJECT	COUNTS
RED	L ____ U ____	____	____	____	____	____
GREEN	L ____ U ____	____	____	____	____	CYCLES
	^{3}H	^{14}C	^{32}P	$^{3}H/^{14}C$	$^{3}H/^{32}P$	$^{14}C/^{32}P$

DATE June 85 SHEET 1 of 1

EXP'T

NAME Incinerator Waste Results

A.E.S. RATIO	SAMPLE NUMBER	TIME	GROSS COUNTS AND % STD. DEV.				NET CPM		CHANNELS RATIO	REMARKS
		MINUTES	RED		GREEN		RED	CPM GREEN	CPM GREEN/RED	
	100	10.00	523	5.0			52.3	56.05		
	101	10.00	598	5.0			59.8	56.1		
	120	10.00	579	5.0			57.9	1.8	4.09	
	121	10.00	625	5.0			62.5	6.4	14.54	
	12	10.00	666	5.0			66.6	10.5	23.86	
	130	10.00	569	5.0			56.9	51.2		
	131	10.00	455	5.0			45.5			
	100	10.00	557	5.0			55.7	~~14C~~ 4.5	5.62	
	101"	10.00	1106	4.0			110.6	59.4	74.25	
	102	10.00	511	5.0			51.1	NDA		

^{3}H

TO REORDER, SPECIFY PACKARD CATALOG NO.

A619562

	DISCRIMINATORS	% GAIN	PRESET COUNT	BACKGROUND SUBTRACTION	LOW LEVEL REJECT	COUNTS
RED	L ____ U ____					
GREEN	L ____ U ____					CYCLES

^{3}H ^{14}C ^{32}P $^{3}H/^{14}C$ $^{3}H/^{32}P$ $^{14}C/^{32}P$

DATE 11 Oct. 85 SHEET 1 of 2

EXP'T EA 44 %

NAME Waste Barrels

A.E.S. RATIO	SAMPLE NUMBER	TIME MINUTES	GROSS COUNTS AND % STD. DEV. RED		GREEN		NET CPM RED	CPM GREEN	CHANNELS RATIO DPM. GREEN/RED	REMARKS
	170	10.00	380	7.0			38.0			
	17.	10.00	458	5.0			45.8	39.4		
	152	10.00	345	7.0			34.5			
Outside A.	110	10.00	518	5.0			51.8	12.4	28.18	
Side Wall	I 1	10.00	445	5.0			44.5	5.1	11.59	
Bottom	I 2	10.00	443	5.0			44.3	4.9	11.14	
Outside B.	11.	10.00	466	5.0			46.6	7.2	16.36	
Wall	11.	10.00	403	5.0			40.[illegible]	0.9	2.04	
Bottom	I 1	10.00	436	5.0			4[illegible]6	4.2	9.54	
Outside #8	116	10.00	449	5.0			44.9	5.5	12.5	
Wall	117	10.00	2198	3.0			219.[illegible]	180.4	410.0	
Bottom	118	10.00	221	2.0			22.1	Recount P.2	828.2 CPM =	788.8 = 1792.72 DPM
Outside #9	120	10.00	505	5.0			50.5	11.1	25.23	
Wall	12.	10.0-0	665	5.0			66.5	27.1	61.59	
Bottom	122	10.00	119	4.0			119.9	80.5	182.95	
Outside #10	123	10.00	545	5.0			54.5	15.1	34.32	
Wall	12.	10.00	2164	3.0			216.4	177.0	402.27	
Bottom	12.	10.00	454	.5			8745.4	8706.0	19786.36	1.98×10^4
Outside #11	26	10.00	472	5.0			4[illegible].2	7.8	17.73	
Wall	12[illegible]	10.00	506	5.0			50.6	11.2	25.45	
Bottom	12.	10.00	498	5.0			49.[illegible]	10.4	23.64	
	130	10.00	266	2.0			26.6			

TO REORDER: SPECIFY PACKARD CATALOG NO. 1655020

A619563

Packard

	DISCRIMINATORS	% GAIN	PRESET COUNT	BACKGROUND SUBTRACTION	LOW LEVEL REJECT	COUNTS
RED	L ____ U ____	____	____	____	____	____
GREEN	L ____ U ____	____	____	____	____	CYCLES ____
	^{3}H	^{14}C	^{32}P	$^{3}H/^{14}C$	$^{3}H/^{32}P$	$^{14}C/^{32}P$

DATE 15 Oct 85 SHEET 2 of 2

EXP'T EH 85/6

NAME Waste Pond

A.E.S. RATIO	SAMPLE NUMBER	TIME	GROSS COUNTS AND % STD. DEV.				NET CPM		CHANNELS RATIO	REMARKS
		MINUTES	RED		GREEN		RED	CPM GREEN	DPM GREEN/RED	
	15.	10.00	599	5.0			59.9			
	15.	10.00	553	5.0			55.3	58.5		
	11.	10.00	603	5.0			60.3			
Outside A	110	10.00	622	5.0			62.2	9.7	4.62	
Wall	11.	10.00	564	5.0			56.4	N.D.A.		
Bottom	11.	10.00	542	5.0			54.2	0 N.D.A		
Outside B.	11.	10.00	586	5.0			5[illegible]6	0.1	0.125	
Wall	11.	10.00	517	5.0			51.7	N.D.A		
Bottom	11.	10.00	571	5.0			5[illegible].1	N.D.A.		
Outside H8	116	10.00	545	5.0			54.5	N.D.A.		
Wall	117	10.00	814	5.0			81.4	22.9	28.62	
Bottom	11.	10.00	988	5.0			98.8	40.3	50.38	
Outside H9	120	10.00	562	5.0			56.2	N.D.A		
Wall	12.	10.00	661	5.0			66.1	7.6	9.5	
Bottom	122	10.00	682	5.0			68.2	9.7	12.12	
Outside H10	12.	10.00	600	5.0			60.0	1.5	1.88	
Wall	12.	10.00	181[illegible]	4.0			I[illegible]1.[illegible]	122.8	153.5	
Bottom	125	10.00	35645	.7			[illegible]564.5	3506.0	4382.5	
Outside H11	[illegible]26	10.00	592	5.0			59.2	N.D.A		
Wall	127	10.00	567	5.0			563[illegible]	N.D.A		
Bottom	[illegible]2.	10.00	5[illegible]	5.0			57.3	N.D.A		
Bottom H8 3H	130	10.00	8282	2.0			828.2			

TO REORDER: SPECIFY PACKARD CATALOG NO. 1455020

A619510

Packard

	DISCRIMINATORS	% GAIN	PRESET COUNT	BACKGROUND SUBTRACTION	LOW LEVEL REJECT	COUNTS
RED	L ____ U ____					
GREEN	L ____ U ____					CYCLES
	^{3}H	^{14}C	^{32}P	$^{3}H/^{14}C$	$^{3}H/^{32}P$	$^{14}C/^{32}P$

DATE 10 Jan 85 SHEET ____ of ____

EXP'T EFF 44% 14C 80%

NAME Waste Barrels

A.E.S. RATIO	SAMPLE NUMBER	TIME MINUTES	GROSS COUNTS AND % STD. DEV. RED		GREEN		NET CPM RED	CPM GREEN	CHANNELS RATIO DPM GREEN/RED	REMARKS
14C Background	108	10.00	608	5.0			60.8	57.0		
		[illegible]	[illegible]	532	5.0		53.2	~~53.2~~		
Outside #A	141	10.00	582	5.0			58.2	1.2	1.5	
Bottom	15.	10.00	502	5.0			50.2	N.D.A.		
	71	10.00	57	5.0			5.			
3	152	10.00	64	5.0			6.4			
Inside	15.	10.00	556	5.0			55.6	N.D.A		
Outside #B	154	10.00	575	5.0			57.5	0.5	0.62	
Bottom	155	10.00	547	5.0			54.7	NDA		
Inside	156	10.00	584	5.0			58.4	1.4	1.75	
Outside #C	157	10.00	642	5.0			64.2	7.2	9.0	
Inside	158	10.00	780	5.0			78.0	21.0	26.25	
Bottom	15.	10.00	754	5.0			75.4	18.0	22.5	
3H Background	130	10.00	1047	4.0			104.7	110.4		
	131	10.00	[illegible]	4.0			[illegible]			
Bottom #A	138	10.00	2966	3.0			296.6	186.2	423.18	
Side	140	10.00	1070	4.0			167.0	56.6	128.64	
Inside	141	10.00	1209	4.0			120.9	10.5	23.86	
Bottom #B	142	10.00	1790	4.0			179.0	68.6	155.91	
Inside	143	10.00	1838	4.0			183.8	73.4	166.82	
Outside	144	10.00	875	5.0			87.5	N.D.A.		
Bottom #C	145	10.00	1585	4.0			158.5	48.1	109.32	
Inside	146	10.00	1341	4.0			134.1	23.7	53.86	
Outside	147	10.00	597	5.0			59.7	N.D.A		

TO REORDER: SPECIFY PACKARD CATALOG NO. 1655020

A619509

Packard

	DISCRIMINATORS	% GAIN	PRESET COUNT	BACKGROUND SUBTRACTION	LOW LEVEL REJECT	COUNTS
RED	L ____ U ____	____	____	____	____	____
GREEN	L ____ U ____	____	____	____	____	CYCLES ____
	^{3}H	^{14}C	^{32}P	$^{3}H/^{14}C$	$^{3}H/^{32}P$	$^{14}C/^{32}P$

DATE 19 Dec-84 SHEET ____ of ____

EXP'T EFF 44% 14C 80%

NAME Waste Barrels

A.E.S. RATIO	SAMPLE NUMBER	TIME MINUTES	GROSS COUNTS AND % STD. DEV. RED		GROSS COUNTS AND % STD. DEV. GREEN		NET CPM RED	NET CPM C.P.M. ~~GREEN~~	CHANNELS RATIO D.P.M. ~~GREEN~~/RED	REMARKS
3H Bottom #6	100	10.00	685	5.0			68.5	45.95	104.93	
Outside	101	10.00	680	5.0			68.0	25.45	57.84	
Inside	109	10.00	638	5.0			63.8	21.35	48.3	
Background	110	10.00	389	7.0			38.9	42.55	~~48.~~	
	111	10.00	462	5.0			46.2			
Bottom #12	112	10.00	4474	2.0			447.4	404.85	920.11	
Outside	113	10.00	42	5.0			42.2	N.D.A		
Inside	114	10.00	463	5.0			46.3	3.75	8.52	
Bottom #13	115	10.00	404	5.0			40.4	N.D.A.		
Outside	116	10.00	452	5.0			45.2	2.65	6.02	
Inside	117	10.00	418	5.0			41.8	N.D.A.		
Outside	118	10.00	451	5.0			45.1	2.55	5.8	
Inside	120	10.00	76	5.0			76.7	34.15	77.61	
Bottom	121	10.00	487	5.0			48.7	6.15	13.98	
14C Background	130	10.00	57	5.0			57.7	57.95		
	138	10.00	582	5.0			58.2			
Bottom #12	139	10.00	560	5.0			56.0	NDA		
Inside	100	10.00	558	5.0			55.8	NDA		
Outside	101	10.00	538	5.0			53.8	NDA		
Bottom #13	102	10.00	1021	4.0			102.1	44.15	55.19	
Inside	103	10.00	565	5.0			56.5	NDA		
Outside	104	10.00	584	5.0			58.4	0.45	0.56	
Bottom #14	105	10.00	554	5.0			55.4	NDA		
Inside	106	10.00	590	5.0			59.0	1.05	1.31	
Outside	107	10.00	615	5.0			61.5	3.55	4.44	

TO REORDER, SPECIFY PACKARD CATALOG NO. [illegible]

A577991

	DISCRIMINATORS	% GAIN	PRESET COUNT	BACKGROUND SUBTRACTION	LOW LEVEL REJECT	COUNTS
RED	L ____ U ____	____	____	____	____	____
GREEN	L ____ U ____	____	____	____	____	____
	^{3}H	^{14}C	^{32}P	$^{3}H/^{14}C$	$^{3}H/^{32}P$	$^{14}C/^{32}P$

CYCLES ____

DATE 18 Oct 87 SHEET ____ of ____

EXP'T EFF 44%

NAME Waste Barrels

A.E.S. RATIO	SAMPLE NUMBER	TIME (MINUTES)	GROSS COUNTS AND % STD. DEV. RED		GROSS COUNTS AND % STD. DEV. GREEN		NET CPM RED	NET CPM GREEN	CHANNELS RATIO	REMARKS
Outside #4	100	10.00	545	5.0			54.5	5.4	12.27	
Inside	101	10.00	9 68	2.0			9 6.8	946.7	2151.6	
Bottom	102	10.00	10213	.4			1021.3	972.2	2209.54	
Outside #7	103	10.00	517	5.0			51.7	2.6	5.9	
Inside	104	10.00	2039	3.0			203.9	154.8	351.82	
Bottom	105	10.00	978	5.0			97.8	48.7	110.68	
Outside #5	106	10.00	805	5.0			80.5	31.4	71.36	
Inside	107	10.00	3698	3.0			369.8	320.7	728.86	
Bottom Liquid	108	10.00	1704328	.1			170432.8	liquid	in barrel	
Plastic	109	10.00	3132	3.0			313.2	264.1	600.23	
Outside #2	110	10.00	37	.0			37.7	N.D.A.		
Inside	111	10.00	898	5.0			89.8	40.7	92.5	
Bottom	112	10.00	455	5.0			45.5	N.D.A.		
Background	113	10.00	470	5.0			47.0	49.1		
	114	10.00	512	5.0			51.2			
Inside #4	120	10.00	9958	2.0			995.8	946.7	2151.6	
Bottom Liquid #5	121	10.00	1684809	.1			168480.9	168431.8	3.83×10^5	

ATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm²	Bq/100 cm²
...d	4 μsi	Outside Waste contain	100	β	10	162	16.2	15.1	0.9	3.0	5.0×10^{-2}
-7-85	1.8 μsi	" " "	"	β	"	147	14.7	"	NDA		
...I	1.8 μsi	Outside Waste contain	100	β	10	150	15.0	15.1	NDA		
...va ...1/85	9.2 μsi	Outside Waste Contain	100	β	10	143	14.3	14.5	NDA.		
...hot ...I -18-85	9.59 μsi	Outside Waste Contain	100	β	10	129	12.9	13.1	NDA		
...ubone ...I -10-85	5.44 μsi	Outside Waste Contain	100	β	10	144	14.4	14.3	0.1	0.33	5.5×10^{-3}
	<1.0 μsi	" " "	100	β	10	139	13.9	14.3	NDA		
...ubone ...I -14-85	1 μsi	Outside Waste Contain	100	β	10	151	15.1	15.2	NDA		
...va ...I -1-85	5 μsi	Outside Waste Contain	100	β	10	155	15.5	15.3	0.2	0.67	1.11×10^{-2}
	<1 μsi	" " "	"	"	"	149	14.9	"	NDA		
	1 μsi	" " "	"	"	"	152	15.2	"	NDA		
	1 μsi	" " "	"	"	"	155	15.5	"	0.2		
	2 μsi	Outside Waste Contain	100	β	10	150	15.0	15.3	NDA	0.67	1.11×10^{-2}
...va ...I -2-85	8 μsi	Outside Waste Contain	100	β	10	143	14.3	14.5	NDA		
...va ...I -3-85	6 μsi	Outside Waste Contain	100	β	10	155	15.5	15.1	0.4	1.33	2.22×10^{-2}
...ar -12-85	^{125}I - 2 μsi	Outside Waste Contain	100	β	10	167	16.7	12.4	3.3	11.0	1.83×10^{-1}

ATE	WIPE	LOCATION	AREA cm2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm2	Bq/100 cm2
Trad. 2-15-84	1 125I-1.75μci	Outside Waste Container	100	β	10	161	16.1	11.1	5.0	16.67	8.78×10⁻¹
Ebert 3-7-84	125I 8.72μci	Outside Waste Container	100	β	10	138	13.8	12.6	1.2	4.0	6.42×10⁻²
Ebert 3-9-84	125I-8.09μci	Outside Waste Container	100	β	10	145	14.5	14.8	N.D.A		
Eva 4-4-84	125I 1.5μci	Outside Waste Container	100	β	10	17	1.7	1.8	N.D.A		
	125I 1.3μci	" " "	"	"	"	18	1.8	1.8	"		
	125I 1.4μci	Outside Waste Container	100	β	10	16	1.6	1.8	N.D.A		
Dubose 5-21-84	125I-<5.4μci	Outside Waste Container	100	β	20	44	2.2	2.0	0.2	0.67	1.0×10⁻²
5-22-84	125I <1μci	Outside Container	100	β	10	30	3.0	2.1	0.9	2.73	4.55×10⁻²
Ebert 5-23-84	125I <8.7μci	Outside Container	100	β	10	25	2.5	2.1	0.4	1.21	2.02×10⁻²
Ebert 5-31-84	125I < 8.83	Outside Waste Container	100	β	10	30	3.0	2.9	0.1	0.3	5.05×10⁻³
Eva 6-1-84	125I < 1.6μci	Outside Waste Container	100	β	10	24	2.4	2.4	N.D.A		
Eva 6-8-84	125I 0.3μci	Outside Waste Container	100	β	10	124	12.4	12.6	N.D.A		
Downy Tarasse 8/28/84	125I 6.9μci	Outside Container	100	β	10	121	12.1	12.4	N.D.A		

DATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/$100cm^2$	Bq/100 cm^2
Leva 2-3-83	1.54 μci	Outside Waste Container	100	β	10	191	19.1	18.2	0.9	2.25	3.75×10^{-2}
Leva 2-22-83	2.78 μci	Outside Waste Container	100	β	10	151	15.1	13.9	1.2	3.0	5.6×10^{-2}
Leva 4-28-83	3.2 μci	Outside Waste Container	100	β	10	127	12.7	12.8	N.D.A		
Ebert 7-7-83	3.5 μci	Outside Waste Container	100	β	10	115	11.5	12.9	N.D.A		
Ebert 7-8-83	7.5 μci	Outside Waste Container	100	β	10	116	11.6	10.6	1.0	3.33	5.56×10^{-2}
Ebert 7-15-83	8.55 μci	Outside Waste Container	100	β	10	155	15.5	16.1	N.D.A.		
Leva 8-7-83	1.6 μci	Outside Waste Container	100	β	10	149	14.9	13.6	1.3	4.33	$7.22 \times 10^{-}$
Suek 10-17-83	1.2 μci	Outside Waste Container	100	β	10	30	3.0	2.0	1.0	3.33	5.56×10^{-2}
	0.4 μci	" " "	100	β	10	22	2.2	2.0	0.2	0.67	1.11×10^{-2}
Ebert 11-7-83	4.4 μci	Outside Waste Container	100	β	10	141	14.1	14.2	N.D.A		
Leva 12-30-83	2.5 μci	Outside Waste Cont.	100	β	10	60	6.0	2.3	3.7	11.21	1.87×10^{-1}
	0.8 μci	Outside Waste Cont	100	β	10	95	9.5	2.3	7.2	21.82	3.64×10^{-1}
Ebert 1-18-84	7.1 μci ^{125}I	Outside Waste Cont.	100	β	10	28	2.8	1.6	1.2	3.64	6.06×10^{-2}
Read 2-7-84	6.25 μci ^{125}I	Outside Waste Cont.	100	β	10	125	12.5	12.9	N.D.A		

TE	WIPE	LOCATION	AREA cm²	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm²	Bq/100 cm²
2-82	1.02μci	Outside Waste Container	100	β	10	156	15.6	15.1	0.5	1.25	2.08×10^{-2}
16-82	2.77μci	Outside Waste Container	100	β	10	239	23.9	24.2	—	—	—
	1.53μci	Outside Waste Container	100	β	10	254	25.4	24.2	1.2	3.0	5.0×10^{-2}
18-82	8.0μci	Outside Waste Container	100	β	10	247	24.7	24.3	0.4	1.0	1.67×10^{-2}
19-82	1.77μci	Outside Waste Container	100	β	10	258	25.8	24.3	1.5	3.75	6.25×10^{-2}
23-82	2.3μci	Outside Waste Container	100	β	10	133	13.3	13.0	0.3	0.75	1.25×10^{-2}
24-82	1.9μci	Outside Waste Container	100	β	10	128	12.8	15.1	—	—	
	1.65μci	" " "	"	"	"	152	15.2	15.1	0.1	0.25	4.17×10^{-3}
-5-82	9.32μci	Outside Waste Container	100	β	20	337	16.85	15.8	1.05	2.62	4.37×10^{-2}
-2-82	4.02μci	Outside Waste Container	100	β	10	191	19.1	16.8	2.3	5.75	9.58×10^{-2}
	2.0μci	" " "	"	"	"	185	18.0	"	1.2	3.0	5.0×10^{-2}
-3-82	2.7μci	Outside Waste Cont.	100	β	10	120	12.0	13.4	—	—	
	1.3 "	" " "	"	"	"	137	13.7	"	0.3	0.75	1.25×10^{-2}
	1.0μci	Outside Waste Cont	100	β	10	126	12.6	13.4	—	—	
-3-82	1.7μci	Outside Waste Cont	100	β	10	134	13.4	13.4	—	—	
	1.4μci	Outside " "	100	β	10	133	13.3	13.4	—	—	
bent	<.21μci	Outside Waste Cont	100	β	10	253	25.3	15.8	9.5	23.75	3.96×10^{-1}
1983	5.2μci	" " "	100	β	10	263	26.3	15.8	10.5	26.25	4.38×10^{-1}
eva	3.5μci	Outside Waste Cont	100	β	10	178	17.8	14.9	2.9	7.25	1.21×10^{-1}
-31-83	2.05μci	" " "	"	"	"	144	14.4	"	—	—	
	2.2μci	Outside Waste Cont	100	β	10	126	12.6	14.9	—	—	

DATE	WIPE	LOCATION	AREA cm²	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm²	Bq/100cm²
[illegible]	1.04 μci										
3-26-81	1	Outside Waste Container	100	β	10	180	18.0	17.6	0.4	1.0	1.67×10^{-2}
	2	" " "	100	β	10	177	17.7	17.6	0.1	0.25	4.17×10^{-3}
[illegible]	1.42 μci										
4-8-81	1	Outside Waste Container	100	β	10	189	18.9	19.4	-	-	-
	2	" " "	100	β	10	207	20.7	19.4	1.3	3.25	5.42×10^{-2}
[illegible]	7.2 μci										
6-5-81	1	Outside Waste Container	100	β	10	217	21.7	20.4	1.3	3.25	5.42×10^{-2}
	2	" " "	100	β	10	198	19.8	20.4	-	-	-
[illegible]	4.67 μci										
[illegible]-17-81	1	Outside Waste Container	100	β	10	263	26.3	25.4	0.9	2.25	3.75×10^{-2}
"	2	" " "	100	β	10	265	26.5	25.4	1.1	2.75	4.58×10^{-2}
	1.65 μci										
[illegible]-17-81	1	Outside Waste Container	100	β	10	247	24.7	25.4	-	-	-
"	2	" " "	100	β	10	267	26.7	25.4	1.3	3.25	5.42×10^{-2}
10-28-81	2.2 μci	Outside Waste Container	100	β	10	152	15.2	13.8	2.0	5.0	8.33×10^{-2}
10-28-81	7.7 μci	Outside Waste Container	100	β	10	164	16.4	13.8	3.4	8.5	1.42×10^{-1}
[illegible]-5-82	1.45 μci	Outside Waste Container	100	β	10	156	15.6	14.6	1.0	2.5	4.17×10^{-2}
[illegible]-27-82	3.26 μci	Outside Waste Container	100	β	10	156	15.6	14.9	0.7	1.75	2.92×10^{-2}
[illegible]-4-82	< 2 μci	Outside Waste Container	100	β	10	157	15.7	15.3	0.4	1.0	1.67×10^{-2}
[illegible]-82	< 8 μci	Outside Waste Container	100	β	10	158	15.8	14.6	1.2	3.0	5.0×10^{-2}
7-8-82	2.01 μci	Outside Waste Container	100	β	10	143	14.3	14.1	0.2	0.5	8.33×10^{-3}

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

ATTENTION: CLINTON A. HODDER, COL., CDR.

DATE: 08/01/91

LICENSE #: 20-00315-02

ARMY, DEPARTMENT OF THE
US ARMY NATICK RESEARCH & DEVELOPME
ATTN: STRNC-ZSR
NATICK, MA 01760

Dear Sir/Madame:

The Nuclear Regulatory Commission (NRC) has a need to confirm the placement, use, condition, and/or disposition of sealed sources and devices for the purpose of evaluating the effectiveness of NRC regulations. As a NRC licensee, your firm has been chosen to participate in a census of sealed sources and devices (see definition Enclosure 1) that contain radioactivity equal to or in excess of one millicurie and are listed in Table 1 (Enclosure 2). Your license includes the material types below:

C14, CA45, CO60, CR51, H3, I125, P32, S35 (Please see Table 1 Notes)

NRC records indicate that the person named above is responsible for the use, storage and disposal of radioactive byproduct material at your facility and may be the appropriate person to complete the questionnaire. In the event that the point of contact has changed or no contact is listed, please forward the questionnaire to the appropriate person.

The person completing the questionnaire should answer all the questions in accordance with the instructions provided and return the entire package of instructions and forms in the enclosed postage-paid envelope within two weeks of receipt. In the event that the return envelope is misplaced, our mailing address is:

Oak Ridge Associated Universities
Energy and Environmental Systems Division
P.O. Box 117
Oak Ridge, TN 37831-0117

This survey has been approved by the Office of Management and Budget. It is being conducted for the NRC by Oak Ridge Associated Universities of Oak Ridge, Tennessee. If you have any questions concerning the survey, call Robert Menard at (615) 576-0118 between the hours of 8:00 a.m. - 4:00 p.m. Eastern Standard Time. The information that you provide in this survey will be treated according to confidential procedures under the Privacy Act (5 U.S. Code 552a).

Thank you for your assistance.

Enclosures:

1) Instructions for Completing the Form (Reverse, "Licensee Information")
2) Table 1 (List of Sealed Sources of Interest)
3) Survey Form (Two copies provided, please photocopy extras as needed)

SEALED SOURCE/DEVICE SURVEY FORM INSTRUCTIONS

PART A

1.0 (a-b)	A sealed source is any radioactive material that is encased in a capsule or a matrix designed to prevent the leakage or escape of the radioactive material. Check the appropriate box to indicate if you have any sealed sources containing radionuclides with activity equal to or greater than one millicurie (see Table 1). If YES is checked, **complete this form for each sealed source and/or device type.** See question 1.0 (c) if you have multiple sealed sources that have identical model numbers.
1.0 (c)	If you have multiple identical sealed sources that have identical model numbers, indicate the total number of sources this form represents. Otherwise, fill out a separate form for each source and/or device.
2.1 (a-b)	Give the element and mass number for the radionuclide. For example, Cs 137.
2.2 (a-d)	Give the activity of the radionuclide in either curies, millicuries, becquerels, or grams.
2.3	If available, give the date the activity was measured or assayed (Month/Day/Year).
3.1, 3.2, 3.3	If available, give the manufacturer, model number and serial number for the source. Please spell out the manufacturer's name.
4.1, 4.2, 4.3	If available, give the manufacturer, model number and serial number for the device (unit containing the source). Please spell out the manufacturer's name.
5.0	Check the one box that is most appropriate for the principle use of the radioactive material. If multiple primary uses exist, use multiple forms.
6.0 (a-b)	Indicate the source/device status by checking the appropriate box. If the form represents multiple sources, enter the quantity (number) for those actively used (at least once in the past year) and the quantity for those inactive. If all are actively used, enter the quantity (number) in box (a) and proceed to PART B on the reverse side of this form.
6.1 (a-c)	For an inactive source, mark the appropriate category. For multiple, identical sources enter the total number in each status.
7.0 (a-f)	What are your plans for the inactive source(s)? Enter the quantity (number) for each choice in the appropriate categories.
8.0	Use this area or additional sheets for comments or explanations you may have for **PART A** of the survey.

PART B

1.0 (a-b)	Check the appropriate box indicating whether you have lost a sealed source with activity equal to or greater than one millicurie (see Table 1) during 1990. **A form is required for each unique sealed source or device type.** If no, go to 6.0.
1.0 (c)	If you checked YES [1.0 (b)], give the quantity (number) of sealed sources lost **only if they have identical model numbers. If they are different, use a separate form for each source lost.**
2.1 (a-b)	Give the element and mass number for the radionuclide. For example, Cs 137.
2.2 (a-d)	Give the activity of the radionuclide in either curies, millicuries, becquerels, or grams.
2.3	If available, give the date the activity was measured or assayed (Month/Day/Year).
3.1, 3.2, 3.3	If available, give the manufacturer, model number and serial number for the source. Please spell out manufacturer's name.
4.1, 4.2, 4.3	If available, give the manufacturer, model number and serial number for the device (unit containing the source). Please spell out manufacturer's name.
5.0	Use this area or additional sheets for comments or explanations you may have for **PART B** of the survey.
6.0 (a-c)	Legibly print your name and date. Return the entire package in the pre-addressed envelope. Thank you for your cooperation.

LICENSEE INFORMATION	
LICENSE NUMBER:	20-00315-02
APPLICANT NAME:	ARMY, DEPARTMENT OF THE
DEPARTMENT/BUREAU:	US ARMY NATICK RESEARCH & DEVELOPME
BUILDING:	
STREET ADDRESS:	ATTN: STRNC-ZSR
CITY:	NATICK
STATE AND ZIP CODE:	MA 01760
PHONE NUMBER:	508-651-5208
CONTACT NAME:	CLINTON A. HODDER, COL., CDR.

Please make the appropriate corrections to your company's information above. Official changes to your license must be made directly to the Nuclear Regulatory Commission.

Please complete a survey form for each sealed source listed in Table 1 for which activity is equal to or exceeds 1 millicurie. Return a survey form even if you have no sources to report (for verification of company/licensee information). Complete as many forms as necessary to report each of the sealed sources meeting the criteria in Table 1. Detailed instructions are printed on the back of this form.

As you respond to questions:

- Please provide as much information as possible.
- All questions may not be applicable to your circumstances.
- You may be contacted for follow-up information.

Two copies of the survey have been included for your convenience. Should you need additional forms, you may reproduce the survey form or you may request additional forms from Oak Ridge Associated Universities at (615) 576-0118.

OFFICE USE ONLY

Date -> Mailed _____ Received _____ Entered _____

TABLE 1

AC		ACTINIUM
AC	227	ACTINIUM
AC	228	ACTINIUM
AG	110	SILVER
AG	110M	SILVER
AG	111	SILVER
AM		AMERICIUM
AM	241	AMERICIUM
AM	242	AMERICIUM
AM	242M	AMERICIUM
AM	243	AMERICIUM
AM	244	AMERICIUM
AM	246	AMERICIUM
AR	37	ARGON
AR	41	ARGON
AS	72	ARSENIC
AS	73	ARSENIC
AS	74	ARSENIC
AS	76	ARSENIC
AS	77	ARSENIC
BA	131	BARIUM
BA	133	BARIUM
BA	137M	BARIUM
BA	140	BARIUM
BI	207	BISMUTH
BI	210	BISMUTH
BK	247	BERKELIUM
BK	249	BERKELIUM
BK	250	BERKELIUM
BR	76	BROMINE
BR	77	BROMINE
BR	80	BROMINE
BR	82	BROMINE
C	14	CARBON
CA		CALCIUM
CA	45	CALCIUM
CA	47	CALCIUM
CD	109	CADMIUM
CD	113	CADMIUM
CD	113M	CADMIUM
CD	115	CADMIUM
CD	115M	CADMIUM
CE	137	CERIUM
CE	139	CERIUM
CE	141	CERIUM
CE	143	CERIUM
CE	144	CERIUM
CF		CALIFORNIUM
CF	241	CALIFORNIUM
CF	249	CALIFORNIUM
CF	250	CALIFORNIUM
CF	252	CALIFORNIUM
CF	253	CALIFORNIUM
CL	35	CHLORINE
CL	36	CHLORINE
CL	38	CHLORINE
CM		CURIUM
CM	242	CURIUM
CM	243	CURIUM
CM	244	CURIUM
CM	245	CURIUM
CM	246	CURIUM
CM	247	CURIUM
CM	248	CURIUM
CM	249	CURIUM
CM	250	CURIUM
CO		COBALT
CO	57	COBALT
CO	58	COBALT
CO	60	COBALT
CO	61	COBALT
CO	62	COBALT
CO	63	COBALT
CO	64	COBALT
CR		CHROMIUM
CR	51	CHROMIUM
CR	52	CHROMIUM
CS		CESIUM
CS	134	CESIUM
CS	137	CESIUM
CS	139	CESIUM
CU	64	COPPER
CU	67	COPPER
DY	159	DYSPROISUM
DY	165	DYSPROISUM
ER	169	ERBIUM
EU	152	EUROPIUM
EU	152M	EUROPIUM
EU	154	EUROPIUM
EU	155	EUROPIUM
F	18	FLOURINE
FE	55	IRON
FE	59	IRON
GA	67	GALLIUM
GA	70	GALLIUM
GA	72	GALLIUM
GD	151	GADOLINIUM
GD	153	GADOLINIUM
GD	159	GADOLINIUM
GD	162	GADOLINIUM
GE	68	GERMANIUM
GE	77	GERMANIUM
H	3	HYDROGEN
HF	172	HAFNIUM
HF	180M	HAFNIUM
HF	181	HAFNIUM
HG	195	MERCURY
HG	197	MERCURY
HG	203	MERCURY
HO	166	HOLMIUM
HO	166M	HOLMIUM
I		IODINE
I	125	IODINE
I	126	IODINE
I	128	IODINE
I	129	IODINE
I	131	IODINE
I	132	IODINE
I	133	IODINE
I	135	IODINE
IN	113	INDIUM
IN	113M	INDIUM
IN	114	INDIUM
IN	114M	INDIUM
IR	191M	IRIDIUM
IR	192	IRIDIUM
IR	193	IRIDIUM
IR	194	IRIDIUM
K	40	POTASSIUM
K	42	POTASSIUM
KR	79	KRYPTON
KR	81	KRYPTON
KR	83M	KRYPTON
KR	84	KRYPTON
KR	85	KRYPTON
LA	140	LANTHANUM
LU	172	LUTECIUM
LU	177	LUTECIUM
MG	28	MAGNESIUM
MN	54	MANGANESE
MN	56	MANGANESE
NA	22	SODIUM
NA	24	SODIUM
NB	92M	NIOBIUM
NB	94	NIOBIUM
NB	95	NIOBIUM
ND		NEODYMIUM
NI	59	NICKEL
NI	63	NICKEL
NP	234	NEPTUNIUM
NP	235	NEPTUNIUM
NP	237	NEPTUNIUM
NP	239	NEPTUNIUM
OS	185	OSMIUM
OS	191	OSMIUM
P		PHOSPHORUS
P	31	PHOSPHORUS
P	32	PHOSPHORUS
P	33	PHOSPHORUS
PA	231	PROTACTINIUM
PA	233	PROTACTINIUM
PA	234	PROTACTINIUM
PB	210	LEAD
PD	109	PALLADIUM
PM	145	PROMETHIUM
PM	147	PROMETHIUM
PM	148	PROMETHIUM
PO		POLONIUM
PO	208	POLONIUM
PO	209	POLONIUM
PO	210	POLONIUM
PO	218	POLONIUM
PR	143	PRASEODYMIUM
PT	183	PLATINUM
PT	193	PLATINUM
PT	195M	PLATINUM
PT	197	PLATINUM
PU		PLUTONIUM
PU	236	PLUTONIUM
PU	237	PLUTONIUM
PU	238	PLUTONIUM
PU	239	PLUTONIUM
PU	240	PLUTONIUM
PU	241	PLUTONIUM
PU	242	PLUTONIUM
PU	244	PLUTONIUM
RA	226	RADIUM
RB		RUBIDIUM
RB	86	RUBIDIUM
RE	186	RHENIUM
RE	188	RHENIUM
RU	97	RUTHENIUM
RU	103	RUTHENIUM
RU	105	RUTHENIUM
RU	106	RUTHENIUM
S	34	SULFUR
S	35	SULFUR
SB		ANTIMONY
SB	122	ANTIMONY
SB	124	ANTIMONY
SB	125	ANTIMONY
SC	46	SCANDIUM
SC	47	SCANDIUM
SE	75	SELENIUM

SI	31	SILICON	TE	125M	TELLURIUM	U	238	URANIUM
SM	145	SAMARIUM	TE	129	TELLURIUM	U	239	URANIUM
SM	151	SAMARIUM	TE	132	TELLURIUM	V	48	VANADIUM
SM	153	SAMARIUM	TH		THORIUM	V	49	VANADIUM
SN	113	TIN	TH	225	THORIUM	W		TUNGSTEN
SN	119	TIN	TH	227	THORIUM	W	181	TUNGSTEN
SN	119M	TIN	TH	228	THORIUM	W	185	TUNGSTEN
SN	121	TIN	TH	229	THORIUM	W	187	TUNGSTEN
SN	121M	TIN	TH	230	THORIUM	W	188	TUNGSTEN
SN	125	TIN	TH	231	THORIUM	XE		XENON
SR		STRONTIUM	TH	232	THORIUM	XE	127	XENON
SR	85	STRONTIUM	TH	233	THORIUM	XE	131M	XENON
SR	87	STRONTIUM	TI	44	TITANIUM	XE	133	XENON
SR	89	STRONTIUM	TL	201	THALLIUM	XE	135	XENON
SR	90	STRONTIUM	TL	204	THALLIUM	Y	88	YTTRIUM
TA	182	TANTALUM	TM	166	THULIUM	Y	90	YTTRIUM
TA	183	TANTALUM	TM	170	THULIUM	Y	91	YTTRIUM
TB	160	TERBIUM	TM	171	THULIUM	YB	169	YTTERBIUM
TB	161	TERBIUM	TM	172	THULIUM	YB	175	YTTERBIUM
TC		TECHNETIUM	U		URANIUM	YB	177	YTTERBIUM
TC	96	TECHNETIUM	U	232	URANIUM	ZN	63	ZINC
TC	99	TECHNETIUM	U	233	URANIUM	ZN	65	ZINC
TC	99M	TECHNETIUM	U	234	URANIUM	ZN	69	ZINC
TE	123	TELLURIUM	U	235	URANIUM	ZN	69M	ZINC
TE	123M	TELLURIUM	U	236	URANIUM	ZR	95	ZIRCONIUM
TE	125	TELLURIUM	U	237	URANIUM			

TABLE 1 NOTES:

A ANY BYPRODUCT MATERIAL
A1 ANY BYPRODUCT BETWEEN ATOMIC NUMBERS 1-83
A1X ANY BYPRODUCT BETWEEN ATOMIC NUMBERS 1-83 WITH EXCEPTIONS
A3 ANY BYPRODUCT BETWEEN ATOMIC NUMBERS 3-83
A3X ANY BYPRODUCT BETWEEN ATOMIC NUMBERS 3-83 WITH EXCEPTIONS
A83 ANY BYPRODUCT WITH ATOMIC NUMBERS >83
A83X ANY BYPRODUCT WITH ATOMIC NUMBERS >83 WITH EXCEPTIONS
ACR ANY BYPRODUCT AUTHORIZED UNDER 10 CFR 35.14(d)(4) OF 10 CFR 35
AX ANY BYPRODUCT WITH EXCEPTIONS
DU DEPLETED IN URANIUM 235
ENT ENRICHED THORIUM
ENU ENRICHED URANIUM
ORE BYPRODUCT MATERIAL DEFINED IN SEC. 40.4, 10 CFR 40
SMA SOURCE MATERIAL
SNM SPECIAL NUCLEAR MATERIAL
TUE TRANSURANIC ELEMENTS
TYPB ANY BYPRODUCT SPECIFIED IN 33.100, SCHEDULE A COLUMN 1, 10 CFR 33
TYPC ANY BYPRODUCT SPECIFIED IN 33.100, SCHEDULE A COLUMN 2, 10 CFR 33
VIT ANY BYPRODUCT LISTED IN SECTION 31.11(a) OF 10 CFR 31

31.11 SEC. OF U.S. 10 CFR CODE
35.100 SEC. OF U.S. 10 CFR CODE
35.200 SEC. OF U.S. 10 CFR CODE
35.290 SEC. OF U.S. 10 CFR CODE
35.300 SEC. OF U.S. 10 CFR CODE
35.320 SEC. OF U.S. 10 CFR CODE
35.400 SEC. OF U.S. 10 CFR CODE
35.490 SEC. OF U.S. 10 CFR CODE
35.500 SEC. OF U.S. 10 CFR CODE
35.600 SEC. OF U.S. 10 CFR CODE

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☐ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: _____

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number _____-_____

2.2 Activity: (a) _____ Curies (b) _____ Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/_____ (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

_____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: _____

_____

4.2 Model Number: _____

4.3 Serial Number: _____

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☐ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) ☐ Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) ☐ Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) ☐ Not Needed (c) ☐ Other (Describe) _____

(b) ☐ Damaged _____

LICENSE #: 20-00315-02

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) ☐ Continue storage for future use (b) ☐ Transfer to other licensee (c) ☐ Send for disposal (d) ☐ Transfer to Manufacturer (e) ☐ Problems with disposal. (Explain in number 8.0) (f) ☐ Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) ☐ NO - Go to 6.0 (b) ☐ YES - How many? (c) _____ (Continue)
2.0	INFORMATION ABOUT THE SOURCE
2.1	Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0	SOURCE DESCRIPTION	4.0	DEVICE DESCRIPTION
3.1	Manufacturer: _____	4.1	Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: _____ (b) Date: _____

LICENSE #: 20-00315-02

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☐ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: _____

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number _____-_____

2.2 Activity: (a) _____ Curies (b) _____ Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/_____ (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

_____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: _____

_____

4.2 Model Number: _____

4.3 Serial Number: _____

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☐ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) ☐ Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) ☐ Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) ☐ Not Needed (c) ☐ Other (Describe) _____

(b) ☐ Damaged _____

LICENSE #: 20-00315-02

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) ☐ Continue storage for future use (b) ☐ Transfer to other licensee (c) ☐ Send for disposal (d) ☐ Transfer to Manufacturer (e) ☐ Problems with disposal. (Explain in number 8.0) (f) ☐ Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) ☐ NO - Go to 6.0 (b) ☐ YES - How many? (c) _____ (Continue)
2.0	INFORMATION ABOUT THE SOURCE
2.1	Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0	SOURCE DESCRIPTION	4.0	DEVICE DESCRIPTION
3.1	Manufacturer: _____	4.1	Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: _____ (b) Date: _____

LICENSE #: 20-00315-02

ATTN: CLINTON A. HODDER, COL., CDR.
NRC LICENSE #: 20-00315-02
ARMY, DEPARTMENT OF THE
US ARMY NATICK RESEARCH & DEVELOPME
ATTN: STRNC-ZSR
NATICK , MA 01760 - 5000

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Co - 60

2.2 Activity: (a) _____ Curies (b) 8.0 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: 12 / 13 / 90 (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: E.I. Dupont NEN Products

3.2 Model Number: NER-580

3.3 Serial Number: CO356

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: NA

4.2 Model Number: _____

4.3 Serial Number: _____

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☒ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☐ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) [X] Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) [ ] Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) [ ] Not Needed (c) [ ] Other (Describe) _____

(b) [ ] Damaged _____

LICENSE #: 20-00315-02

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) ☐ Continue storage for future use (b) ☐ Transfer to other licensee (c) ☐ Send for disposal (d) ☐ Transfer to Manufacturer (e) ☐ Problems with disposal. (Explain in number 8.0) (f) ☐ Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) ☒ NO - Go to 6.0 (b) ☐ YES - How many? (c) _____ (Continue)
2.0 2.1	INFORMATION ABOUT THE SOURCE Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0 3.1	SOURCE DESCRIPTION Manufacturer: _____	4.0 4.1	DEVICE DESCRIPTION Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number H - 3

2.2 Activity: (a) _____ Curies (b) 200 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/_____ (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: 3M Company

4.2 Model Number: 703

4.3 Serial Number: 77031

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☐ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☒ Other (Describe): Static Electricity Eliminator

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) [X] Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) [ ] Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) [ ] Not Needed (c) [ ] Other (Describe) _____

(b) [ ] Damaged _____

LICENSE #: 20-00315-02

NRC SSD Survey (OMB Approved 3150-0152) 1/91

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) ☐ Continue storage for future use (b) ☐ Transfer to other licensee (c) ☐ Send for disposal (d) ☐ Transfer to Manufacturer (e) ☐ Problems with disposal. (Explain in number 8.0) (f) ☐ Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) ☒ NO - Go to 6.0 (b) ☐ YES - How many? (c) _____ (Continue)
2.0 2.1	INFORMATION ABOUT THE SOURCE Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0 3.1	SOURCE DESCRIPTION Manufacturer: _____	4.0 4.1	DEVICE DESCRIPTION Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

Date

ROUTING AND TRANSMITTAL SLIP

(Name, office symbol, room number, building, Agency/Post)	Initials	Date
1.		
2.		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

Billy Graszynski

(817) 860-8100

Co. State Dept of Health

1-303-331-8480

Ed Kray,

Ken Wanner 8497

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: *(Name, org. symbol, Agency/Post)*	Room No.—Bldg.
	Phone No.

5041-102

GPO : 1985 O - 485-151

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

Harriet Anderson
800-328-1368
Dr. Richard Murph
512-984-3163
3[illegible] /ESD
Building [illegible]143[redacted]-3N-01
P.O. Box 2963
Austin, TX 78769-2963

1-303-331-0190
Chuck Morrison

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number H - 3

2.2 Activity: (a) _____ Curies (b) 200 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/1967 (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION Denver Co. 7777

4.1 Manufacturer: B.K. Sweeney Company

4.2 Model Number: _____

4.3 Serial Number: _____

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☐ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☒ Other (Describe): Static Electricity Eliminator

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) ☐ Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) X Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) ☐ Not Needed (c) X Other (Describe) Removed from Static Eliminator which was obsolete.

(b) ☐ Damaged

LICENSE #: 20-00315-02

NRC SSD Survey (OMB Approved 3150-0152) 1/91

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status)
	(a) [ ] Continue storage for future use (b) [ ] Transfer to other licensee
	(c) [x] Send for disposal (d) [ ] Transfer to Manufacturer
	(e) [ ] Problems with disposal. (Explain in number 8.0)
	(f) [ ] Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed)
	(Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type.
	(a) [X] NO - Go to 6.0 (b) [ ] YES - How many? (c) _____ (Continue)
2.0	INFORMATION ABOUT THE SOURCE
2.1	Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries
	(c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0	SOURCE DESCRIPTION	4.0	DEVICE DESCRIPTION
3.1	Manufacturer: _____	4.1	Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION.
	(a) Form completed by: Paul G. Angelis - Radiation Protection Officer
	(b) Date: 5 September 1991

LICENSE #: 20-00315-02

Bendix
[illegible]

1-301-992-6680

Ionics Research Inc
Bendix 18713A E/C/D

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) [ ] Continue storage for future use (b) [ ] Transfer to other licensee (c) [X] Send for disposal (d) [ ] Transfer to Manufacturer (e) [ ] Problems with disposal. (Explain in number 8.0) (f) [ ] Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) [X] NO - Go to 6.0 (b) [ ] YES - How many? (c) _____ (Continue)
2.0	INFORMATION ABOUT THE SOURCE
2.1	Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0	SOURCE DESCRIPTION	4.0	DEVICE DESCRIPTION
3.1	Manufacturer: _____	4.1	Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Ni - 63

2.2 Activity: (a) _____ Curies (b) 2 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/_____ (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: Hewlett Packard

4.2 Model Number: 5754B

4.3 Serial Number: 746B01161

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☒ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) ☐ Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) ☒ Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) ☐ Not Needed (c) ☒ Other (Describe) Removed from GC which was obsolete.

(b) ☐ Damaged

LICENSE #: 20-00315-02

NRC SSD Survey (OMB Approved 3150-0152) 1/91

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) [ ] Continue storage for future use (b) [ ] Transfer to other licensee (c) [x] Send for disposal (d) [ ] Transfer to Manufacturer (e) [ ] Problems with disposal. (Explain in number 8.0) (f) [ ] Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) [X] NO - Go to 6.0 (b) [ ] YES - How many? (c) _____ (Continue)
2.0 2.1	INFORMATION ABOUT THE SOURCE Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0 3.1	SOURCE DESCRIPTION Manufacturer: _____	4.0 4.1	DEVICE DESCRIPTION Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Ni - 63

2.2 Activity: (a) _____ Curies (b) 15 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/_____ (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: Bendix Corporation

4.2 Model Number: 25621R

4.3 Serial Number: 100129

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☒ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) ☐ Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) ☒ Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) ☐ Not Needed (c) ☒ Other (Describe) Removed from GC which was obsolete.

(b) ☐ Damaged

LICENSE #: 20-00315-02

NRC SSD Survey (OMB Approved 3150-0152) 1/91

[redacted]

MEMORANDUM OF CALL

Previous editions usable

TO: Paul

☑ YOU WERE CALLED BY— ☐ YOU WERE VISITED BY—

Paul Larson

OF (Organization)

☑ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

RECEIVED BY	DATE	TIME

63-110 NSN 7540-00-634-4018 **STANDARD FORM 63** (Rev. 8-81)
Prescribed by GSA
FPMR (41 CFR) 101—11.6

★ U.S. GPO: 1990 — 262-080

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) ☐ Continue storage for future use (b) ☐ Transfer to other licensee (c) ☐ Send for disposal (d) ☐ Transfer to Manufacturer (e) ☐ Problems with disposal. (Explain in number 8.0) (f) ☐ Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) ☒ NO - Go to 6.0 (b) ☐ YES - How many? (c) _____ (Continue)
2.0	INFORMATION ABOUT THE SOURCE
2.1	Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0	SOURCE DESCRIPTION	4.0	DEVICE DESCRIPTION
3.1	Manufacturer: _____	4.1	Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Ni - 63

2.2 Activity: (a) _____ Curies (b) 15 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: 12 / ___ / 88 (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: Hewlett Packard

3.2 Model Number: Unknown

3.3 Serial Number: L4657

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: Hewlett Packard

4.2 Model Number: 5890A

4.3 Serial Number: LR47359C 2843A14

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☒ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) [X] Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) [ ] Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) [ ] Not Needed (c) [ ] Other (Describe) _____

(b) [ ] Damaged _____

LICENSE #: 20-00315-02

NRC SSD Survey (OMB Approved 3150-0152) 1/91

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) ☐ Continue storage for future use (b) ☐ Transfer to other licensee (c) ☐ Send for disposal (d) ☐ Transfer to Manufacturer (e) ☐ Problems with disposal. (Explain in number 8.0) (f) ☐ Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) ☒ NO - Go to 6.0 (b) ☐ YES - How many? (c) _____ (Continue)
2.0 2.1	INFORMATION ABOUT THE SOURCE Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0 3.1	SOURCE DESCRIPTION Manufacturer: _____	4.0 4.1	DEVICE DESCRIPTION Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Ni - 63

2.2 Activity: (a) _____ Curies (b) 15 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/_____ (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: Hewlett Packard

4.2 Model Number: 5840A

4.3 Serial Number: 2107A08582

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☒ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) [X] Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) [ ] Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) [ ] Not Needed (c) [ ] Other (Describe) _____

(b) [ ] Damaged _____

LICENSE #: 20-00315-02

STRNC-ZSR

12 October 1989
/MHP/ X5208

MEMORANDUM FOR Ms. Sandra Jackson, Transportation, LEHD

SUBJECT: Shipment of Radioactive Material

1. Reference:

a. Title 49 CFR Part 173.421, Limited Quantities of Radioactive Materials.

b. Title 49 CFR Part 173.423, Table of Activity Limits - Excepted Quantities and Articles.

2. On or about 1 September 1989 a shipment of radioactive I^{125}, 6.0 uCi (6.0×10^{-6} Ci) activity, was received by USARIEM from the Peninsula Laboratories Inc., packing slip enclosed. This shipment was received prior to request and will be expired when when required by USARIEM personnel, hence it should be returned to the supplier. The applicable Title 49 CFR packing and shipping requirements for this radioactive I^{125} are as follows.

3. Reference 1a allows shipment of "radioactive materials whose activity per package does not exceed the limits specified in 173.423 are excepted from the specification packaging, shipping paper and certification marking, and labeling requirements of this chapter..."

4. Reference 1b establishes a maximum permissible amount of normal form liquid radioactive material to be shipped in a strong tight container as 10^{-4} (1/1000) of the A_2 quantity specified in 173.435 for the material. The A_2 quantity for I^{125} is 70 Ci, hence the 10^{-4} A_2 limit should be 7000 uCi (7.0×10^{-3}Ci) activity. This limit is much greater than the amount to be returned and the requirements of reference 1a should apply.

5. The following statements should be noted on your documentation:

a. "This is to certify that the above named articles are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to applicable regulations of the DOT."

b. "This package conforms to the conditions and limitations specified in 49 CFR 173.421, for excepted radioactive material, limited quantity, N.O.S., UN 2910."

6. If there are any questions, please call me at X5208.

Encl

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
Mr. Thomas G. Martin III, SATD
Mr. John F. Sieckarski, ISO

STRNC-ZSR

12 October 1989
/MHP/ X5208

MEMORANDUM FOR Ms. Sandra Jackson, Transportation, LEHD

SUBJECT: Shipment of Radioactive Material

1. Reference:

a. Title 49 CFR Part 173.421, Limited Quantities of Radioactive Materials.

b. Title 49 CFR Part 173.423, Table of Activity Limits - Excepted Quantities and Articles.

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3. Reference 1a allows shipment of "radioactive materials whose activity per package does not exceed the limits specified in 173.423 are excepted from the specification packaging, shipping paper and certification marking, and labeling requirements of this chapter..."

4. Reference 1b establishes a maximum permissible amount of normal form liquid radioactive material to be shipped in a strong tight container as 10^{-4} (1/1000) of the A_2 quantity specified in 173.435 for the material. The A_2 quantity for I^{125} is 70 Ci, hence the 10^{-4} A_2 limit should be 7000 uCi (7.0×10^{-3}Ci) activity. This limit is much greater than the amount to be returned and the requirements of reference 1a should apply.

5. The following statements should be noted on your documentation:

a. "This is to certify that the above named articles are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to applicable regulations of the DOT."

b. "This package conforms to the conditions and limitations specified in 49 CFR 173.421, for excepted radioactive material, limited quantity, N.O.S., UN 2910."

6. If there are any questions, please call me at X5208.

Encl

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
Mr. Thomas G. Martin III, SATD
Mr. John F. Sieckarski, ISO

PURCHASE REQUEST AND COMMITMENT
For use of this form, see AR 37-108: the proponent agency is USAFAC.

PURCHASE INSTRUMENT NO.	REQUISITION NO.	DATE	PAGE OF PAGES
W13MWJ	9131-2356	10 MAY 89	

TO:	THRU:	FROM:
Purchasing and Contracting Officer	NRDEC SUPPLY & STORAGE	USARIEM, Natick, Ma.

It is requested that the supplies and services enumerated below or on attached list be:

PURCHASED FOR	DELIVERED TO	NOT LATER THAN (Date)
COMMANDER, USARIEM	CPT. James Agnew, x4861	1 Oct 89

The supplies and services listed below cannot be secured through normal supply channels or other Army supply sources in the immediate vicinity, and their procurement will not violate existing regulations pertaining to local purchases for stock, therefore, local procurement is necessary for the following reason: (Check appropriate box and complete item.)

LOCAL PURCHASES AUTHORIZED AS THE NORMAL MEANS OF SUPPLY FOR THE FORE-GOING BY		REQUISITIONING DISCLOSES NONAVAIL-ABILITY OF ITEMS AND LOCAL PURCHASE IS AUTHORIZED BY
STOCK FUND 2640	4D1	Expendable

EMERGENCY SITUATION PRECLUDES USE OF REQUISITION CHANNELS FOR SECURING ITEM

NAME AND TELEPHONE NO. OF PERSON TO CALL FOR ADDITIONAL INFORMATION

Cpt. James Agnew, D. Morehouse, x4861

Fund Certification WU-051

The supplies and services listed on this request are properly chargeable to the following allotments, the available balances of which are sufficient to cover the cost thereof, and funds have been committed.

ACCOUNTING CLASSIFICATION	AMOUNT
2192040 975-8103 P611102.S15/CA 26AB S19129 CC 947008210105126AB	$1400.00

ITEM	DESCRIPTION OF SUPPLY OR SERVICES	QUANTITY	UNIT	ESTIMATED Unit Price	ESTIMATED Total Cost
1.	Alpha-Atrial Natriuretic (hANP) Polypeptide (human) kit, #RIK-8798 (1.5uCi/kit) PRODUCT RELEASE DATE SEPTEMBER 1989 This product contains radioactive Iodine 125 and therefore requres the approval and license # from Dr Tom Martin. SOURCE: Peninsula Laboratories 611 Taylor Way Belmont, Ca. 94002 1-800-922-1516	4	kit	350.00 6.0μCi	1400.00

DATE	TYPED NAME AND TITLE OF CERTIFYING OFFICER	SIGNATURE
12 May 89	VIOLET M. TRAINER Certifying Officer RADIOACTIVE MATERIAL Approved for Purchase Under BML 20-315-2 RPO Ref. No. A-41-U Radiation Protection Officer	Violet M. Trainer 5/12/89

DISCOUNT

PURCHASE ORDER NUMBER

DELIVERY SCHEDULE

THE FOREGOING ITEMS ARE REQUIRED NOT LATER THAN AS INDICATED ABOVE FOR THE FOLLOWING PURPOSE

Radioimmunoassay kit for clinical analysis

DATE	TYPED NAME AND GRADE OF INITIATING OFFICER	SIGNATURE
8 May 89	MURRAY P. HAMLET, DIR. TELEPHONE NO.	
DATE	TYPED NAME AND GRADE OF SUPPLY OFFICER	SIGNATURE
	JOHN R. SCABIA, APO	

Approved by commanding officer or his designee

DATE	TYPED NAME AND GRADE OF COMMANDING OFFICER OR DESIGNEE	SIGNATURE
12 MAY 89	JOSEPH C. DENNISTON COLONEL, VC Commanding	Lawrence K. Lightner

DA FORM 1 AUG 76 3953

PREVIOUS EDITIONS OF THIS FORM WILL BE USED UNTIL EXHAUSTED.

PACKING LIST

FILE COPY

PENINSULA LABORATORIES, INC.
611 TAYLOR WAY, BELMONT, CALIFORNIA 94002 U.S.A.
(415) 592-5392 TELEX NO. 172511 (PEN LABS BLMT)
FAX NO. (415) 595-4071

PENINSULA LABORATORIES, INC.
611 TAYLOR WAY, BELMONT, CALIFORNIA 94002 U.S.A.

DATE 08/28/89

SOLD TO
US1023
FINANCE & ACCT. OFFICE
U. S. ARMY NATICK
R & D CENTER
KANSAS STREET
NATICK MA 01760-5000

SHIP TO
1023US
U. S. ARMY NATICK
R & D CENTER
WAREHOUSE 20
RECEIVING DEPARTMENT
KANSAS STREET
NATICK MA 01760-5000

OUR ORDER NO.	SHIP VIA
908367	PRIORITY 1

YOUR PURCHASE ORDER NO.
DAAK6089M3085

LOCATION	ITEM NO.	DESCRIPTION LOT NO.	QUANTITY ORDERED	QUANTITY SHIPPED	QUANTITY BA ORDERED
D ROOM	RTK-8798	ANP (Human) RIA Kit 019449	4	4	
		7#			
		3276			
					1400

U.S. GOVERNMENT BILL OF LADING

MEMORANDUM COPY — B/L NO. ▶ D- 0,726,877

1. TRANSPORTATION COMPANY TENDERED TO	2. SCAC	3. DATE B/L PREPARED	4. ROUTE ORDER/RELEASE NUMBER
FEDERAL EXPRESS	FDE-	391017	

5. DESTINATION (Name, address and ZIP code)	6. SPLC (Dest.) / 7. SPLC (Orig.)	8. ORIGIN (Name, address and ZIP code)
PENINSULA LABORATORIES INC 611 TAYLOR WAY BELMONT, CA 94002	376827 141630250	US ARMY NATICK RD&E CENTER KANSAS STREET NATICK, MA 01760-5000

9. CONSIGNEE (Name, address and ZIP code of installation)	10. GBLOC (Cons.)	11. SHIPPER (Name, address and ZIP code)
PENINSULA LABORATORIES INC 611 TAYLOR WAY BELMONT, CA 94002	IOOI	TRANSPORTATION OFFICER US ARMY NATICK RD&E CENTER NATICK, MA 01760-5000

12. APPROPRIATION CHARGEABLE CC: 0161158D200002215
2102040 068-8430 P665896 2215 S19129

13. BILL CHARGES TO (Dept./agency, bureau/office mailing address and ZIP code)
CH, TRANSPORTATION DIVISION
US ARMY FINANCE & ACCTING CTR
INDIANAPOLIS, IN 46249-0611

AGENCY LOC CODE

14. VIA (Route shipment when advantageous to the Government)

15. MARKS AND ANNOTATIONS (If extra services are ordered, see Administrative Directions No. 2 on reverse)

M/F: KATHY HESSE

16. PACKAGES NO.	KIND	17. HM	18. DESCRIPTION OF ARTICLES (Use carrier's classification or tariff description if possible; otherwise use a clear nontechnical description)	19. WEIGHT* (Pounds only)	FOR USE OF BILLING CARRIER ONLY Services	Rate	Charges
			CLASSIFICATION ITEM NO. 43940				
1	BX		CHEMICALS, NOI, IN BOXES REL VAL N/X FIFTY DOLLARS DM: 12.5x12.5x13 CU: 1.18 REQUEST PRIORITY ONE SERVICE ACCOUNT NO. 1021-6724-4 "THIS IS TO CERTIFY THAT THE ABOVE NAMED ARTICLES ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED, AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO APPLICABLE REGULATIONS OF THE DOT."				
					TOTAL CHARGES		

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION, ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

SHIPPER'S SIGNATURE [signature]

20. TARIFF/SPECIAL RATE AUTHORITY	21. PICKUP SERV. FURNISHED / VEHICLE FULLY LOADED	SHIPPER'S INITIALS	22. CARRIER WAY/FREIGHT BILL NO. AND DATE
FDE- TENDER 19 SUP 12	☐ YES ☐ YES		2012108722

23. STOP THIS SHIPMENT AT

FOR:

24. FURNISH INFORMATION ON CAR/TRUCKLOAD/CONTAINER SHIPMENTS

INITIALS & NO.	SEAL NUMBERS	LENGTH/CUBE ORDERED	LENGTH/CUBE FURNISHED	MARKED CAPACITY ORDERED	MARKED CAPACITY FURNISHED	DATE FURNISHED
	APPLIED BY:					

25. CARRIER'S PICKUP DATE (Year, month, & day)	26a. SIGNATURE OF AGENT	26b. PER	B/L NUMBER
89 10/17	Dad Wagner		D- 0,726,877

27. MODE	28. ESTIMATE	29. NO. OF CLS/TLS	30. TYPE RATE	31. PSC	32. REASON
QQ	21				

Received by the transportation company named above, subject to conditions named on the reverse hereof, the property hereinafter described, in apparent good order and condition (contents and value unknown), to be forwarded to destination by the said company and connecting lines, there to be delivered in like good order and condition to said consignee.

FOR USE OF ISSUING OFFICE

33a. ISSUING OFFICE (Name and complete address)
US ARMY NATICK RD&E CENTER
KANSAS STREET
NATICK, MA 01760-5000

33b. GBLOC AGAV

33c. ISSUING OFFICER
SANDRA J. JACKSON CH, COMM TRFC SEC

33d. CONTRACT/PURCHASE ORDER NO. OR OTHER AUTHORITY
AUTH ASD# 89M-3085

33e. DATED

33f. FOB POINT NAMED IN CONTRACT

34d. DELIVERED THIS CONSIGNMENT COMPLETE & IN APPARENT GOOD ORDER EXCEPT AS MAY BE INDICATED ☐ SHORTAGE ☐ DAMAGED

*Show also cubic measurements for shipments via air, truck or water carrier in cases where required.

1103-221

STANDARD FORM 1103-A (Rev. 4-85)
PRESCRIBED BY GSA, FPMR (41 CFR) 101-41.3

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper
TRANSPORTATION OFFICER
US ARMY NATICK RDSE CENTER
KANSAS STREET
NATICK, MA 01760-5000

Air Waybill No. 2012108722

Page 01 of 01 Pages

Shipper's Reference Number (optional) D-0,728,877

Consignee
PENINSULA LABORATORIES INC
611 TAYLOR WAY
BELMONT, CA 94002

Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non-applicable)*

PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY

Airport of Departure: BOSTON, MA

Airport of Destination: SAN FRANCISCO, CA

Shipment type: *(delete non-applicable)*

NON-RADIOACTIVE	RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification				Quantity and type of packing	Packing Inst.	Authorization
Proper Shipping Name	Class or Division	UN or ID No.	Subsidiary Risk			
RADIOACTIVE MATERIAL LIMITED QUANTITY N.O.S.		2910		6.0 mCi 1 STYROFOAM BOX INSIDE 1 FIBERBOARD BOX	173.421	

Additional Handling Information

SHIPMENT PREPARED ACCORDING TO 49 CFR REVISED

I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labelled, and are in all respects in the proper condition for transport by air according to the applicable International and National Government Regulations.

Name/Title of Signatory
SANDRA J. JACKSON CH,COMM TEFC

Place and Date

Signature
(see warning above)

DOC IDENT	RI FROM	M & S	STOCK NUMBER FSC	NIIN	ADD	UNIT OF ISSUE	QUANTITY	DOCUMENT NUMBER SERV	REQUISITIONER	DATE	SERIAL	SUFFIX	SERV	SUPPLEMENTARY ADDRESS	SIGNAL	FUND	DISTRIBUTION	PROJECT	PRIORITY	REQ'D DEL DATE	ADVICE	RI	UNIT PRICE DOLLARS	CTS.
							4		W13G07	9265	4001												$0.00	

SHIPPED FROM: U.S. Army Natick RD&E Center
Logistics Office, LEHD
Kansas St., Natick, MA 01760
ATTN: STRNC-DLC

SHIP TO: PENNISULA LABORATORIES INC.
ATTN: KATHY HESSE
611 TAYLOR WAY
BELMONT, CA 94002

MARK FOR | PROJECT | TOTAL PRICE DOLLARS | CTS.: $0.00

WAREHOUSE LOCATION | TYPE OF CARGO | UNIT PACK | UNIT WEIGHT | UNIT CUBE | U F C | NMFC | FREIGHT RATE | DOCUMENT DATE | MAT COND | QUANTITY | 1/1

SUBSTITUTE DATA (ITEM ORIGINALLY REQUESTED) | FREIGHT CLASSIFICATION NOMENCLATURE | C/R 89M-3085

ITEM NOMENCLATURE 4 KITS OF NO. RIK-8798. ALPHA-ATRIAL
NITREUCTIC POLYPEPTIDE "RADIOACTIVE MATERIAL"

SELECTED BY AND DATE	TYPE OF CONTAINER(S)	TOTAL WEIGHT	RECEIVED BY AND DATE	INSPECTED BY AND DATE
	BX	5	DM: 12.5 X 12.5 X 13"	
PACKED BY AND DATE	**NO. OF CONTAINERS**	**TOTAL CUBE**	**WAREHOUSED BY AND DATE**	**WAREHOUSE LOCATION**
D.MARTIN/9/21/89	1	1.18		

REMARKS: JUSTIFICATION CONTRACT NO. 89M-3085

FIRST DESTINATION ADDRESS: TRANSPORTATION COST ONLY

DATE SHIPPED: 10/17/89

TRANSPORTATION CHARGEABLE TO

14 B/LADING, AWB, OR RECEIVER'S SIGNATURE (AND DATE): D-0,726,877 DTD 17 OCT 89
VIA: FEDERAL EXPRESS

15 RECEIVER'S DOCUMENT NUMBER

DD FORM 1348-1 (6 PT) 1 MAR 74 EDITION OF 1 JAN 64 MAY BE USED UNTIL EXHAUSTED

DOD SINGLE LINE ITEM RELEASE/RECEIPT DOCUMENT

$21.00

KENCE OR OFFICE SYMBOL	SUBJECT Request for Shipping Document
AMSTR-PNS.	Contract No. 89M-3085 Doc. No.

RU Arium FROM Director of Procurement DATE 9-11-89 CMT 1

ATTN: Cpt Agnew

S+S.

Please prepare a document covering shipment at government expense of the following items:

4 kits of No. R1K-8798.
Alpha-Atrial Nitrouretic
Polypeptide.

Radioactive Material

the following address:

Peninsula Laboratories Inc.
attn:- Kathy Hesse
611 Taylor Way
Belmont, Ca. 94002.

Please furnish this office a copy of the shipping document, showing the date and method of shipment.

12.5 X 12.5 X 13 = 1.18

JW
9/21/89

1 Box
5 lbs

9265
A001

Kathy Wilder
Purchasing agent.

ATICK FL 378
Sep 81 EDITION OF 1 AUG 74 IS OBSOLETE.

FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED

STRNC-ZSR

16 April 1990

/MHP/

MEMORANDUM FOR Mr. John Costello, LEHD

SUBJECT: Packard Model B2425 Liquid Scintillation Counter

1. Reference our telephone conversation of 11 April 1990, subject: SAB.

2. In response to your request the following is confirmed.

3. The Packard Instrument Company Model B2425 S/N 18030 Liquid Scintillation (Bar Code 05424/Decal 67526) currently within your control as excess equipment was last used by this office. Prior to turn-in the Ra^{226} check source was removed by a representative of Packard Instrument Company on 13 April 1989, affadavit attached.

4. This item currently does not contain any radiation sources hence may be processed by you. If there are any questions, please contact Mr. John Sieckarski X-4758 or myself X-5208.

Encl

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
Mr. John Sieckarski, ISO
Radiation Notebook

Place this sheet inside the box in which the source is being returned, such that it will be visible upon opening.

TSE Name (print) JOHN STROTHERS

Territory 06 Date 4/13/89

Nuclide CA 226 Activity 20 uc

From Instrument Model No. 2425 S/N 018030

Institution Serviced U.S. ARMY NATICK LAB

Reason for Return INSTRUMENT SCRAPPED

NOTE: If source is leaking radioactivity:
- package extra-tightly (taping especially)
- monitor outside of package; not to exceed 0.5mR/hr. at any point
- notify Technical Service receiving in advance by telephone

I certify that I have prepared this source for shipping in accordance with procedures set forth in TSB ADMIN-43.

Signature

This package conforms to the conditions and limitations specified in 49CFR 173.421 for excepted radioactive material, limited quantity, n.o.s., UN2910

CONSIGNOR

Packard Instrument Co.
2200 Warrenville Road
Downers Grove, IL 60515

STRNC-ZSR

/MHP/ 5208

MEMORANDUM FOR Mr. John Costello, S.S Br, Log Div, LEHD

SUBJECT: Radioactive Check Sources

1. Reference our meeting of 9 July 1990, subject: SAB.

2. On 9 July 1990, reference 1, you had questioned whether the Packard Neutron Spectrometer turned-in by this office had any radioactive sources which required removal prior to final disposition of this item.

3. This memorandum shall confirm that the Packard Neutron Spectrometer, Model B 5236, SN 26770, identified as Natick Bar Code 35165 does not contain an internal radioactive isotope.

4. If there are any questions, please contact Mr. John Sieckarski, Alternate Radiation Protection Officer, X-4758, or myself X-5208.

Encl

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
John F. Sieckarski, Alternate RPO

File

STRNC-ZSR

24 September 1990

MEMORANDUM FOR Mr. J. Dennis Martin, S&S Branch, Logistic Div., LEHD

SUBJECT: Contract/Purchase Order No. DAAK6090P2786, Beckman Instrument Inc.

1. On 18 September 1990 Mr. John Sieckarski, Alternate Radiation Protection Officer, of this office and Mr. Thomas Lynch of Beckman Instruments Inc., removed the radioactive Cs-137 check source from the Beckman Model LS8100T SN 7816018 Scintillation Counter currently located in Material Classification.

2. I am providing you with a photo copy of the Field Service Report, enclosed, for your records so as to close out the above referenced Contract/Purchase Order. Additionally, since this equipment does not contain any radioactive material, it can be processed through property disposal channel.

3. If there are any questions, please contact Mr. Sieckarski X-4758 or myself X-5208.

Encl

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
John Sieckarski, ARPO, ISO (w/encl)
John Costello, S&S Br., Log Div, LEHD (w/encl)
Radiation Folder (w/encl)

BECKMAN
BECKMAN INSTRUMENTS, INC.

FIELD SERVICE REPORT

CUSTOMER

Sheet ____ Of ____

FSR No.	District	Engineer Name	Bio Haz	Div/Op	Call No.	Instrument Model—Serial No.	Call Date/Hour
26351957	7262	T Lynch				LS 8100 — 7816018	9/18/90 12:00

Institution Name	City	State	Alert	C.R.	Accessory Model — Serial No.	Instrument Up Date/Hr	Dispatch Date/Hour
US Army Labs					—	9/18 12:30	9/18 12:00

User	Department	Old Drive S/N	Cur. Counter	Prior Counter	Revolutions	New Drive S/N	Quality Code	Responsible Part
John Seirkowski							0 — 10	

Debit Account	Mgr. Approval	Call Complete:	Call Back Reason:
— —		☒ Yes ☐ No ☐ Parts Only ☐ Phone Repair	☐ Chemistry/Applications ☐ Parts ☐ Recurring Problems ☐ Ship Damage ☐ Short Ship ☐ Error

DESCRIPTION	✓	Part Number	Trans Code	Labor Hrs	Travel Hrs	Tax Code	Part Qty	Hrly Rate/ Unit Price	AMOUNT
			21	1.0	1.0			140.00	280.00
Removed 137 Cs Source		599764	22				1	49.00	49.00

Purchase Order							
DAAK6090P2786						Total From Addendum	
						Total Net	
Tax Amt.	91	—	—			Tax Rate %	Sales Tax

Does Inst. Qualify for Agreement?	Customer Signature	Telephone and Extension	INVOICE AMOUNT
☐ Yes ☐ No	John F. Seirkowski	508 651 4758	329.00

BECKMAN BECKMAN INSTRUMENTS, INC.

FROM:
Tom Lynch
126 West St
Reading MA01867

TO: BECKMAN INSTRUMENTS, INC.
2550 Harbor Blvd
Fullerton CA92634

ATTN: RETURNED GOODS RGA # SD 0265

CUSTOMER COPY
RETURNED GOODS AUTHORIZATION

THIS IS YOUR RETURN LABEL. TEAR IT OUT. FAILURE TO USE THIS LABEL MAY RESULT IN DELAY IN PROCESSING YOUR CLAIM

THIS AUTHORIZATION EXPIRES

10 DAYS FROM 8-29-90

REFERENCE INFORMATION
(ORIGINAL SHIPMENT)

PURCHASE ORDER NO. log 26351952
PURCHASE ORDER DATE sept 1990 SD
SALES ORDER NO. 168612SD

EMERGENCY REPLACEMENT
PURCHASE ORDER NO. ☐ YES
SALES ORDER NO. ☒ NO

CREDIT MEMO

ITEM	DESCRIPTION/REASON FOR ISSUANCE OF CREDIT	ACCOUNT CODE	PART NO. / GENERAL LEDGER	QTY. / ADD. DEPT.
	HM hazardous material being returned for disposal		599764	1
	LS 6800 Brandeis			
	LS 8100 SN 7816018 US Army Labs			

DO NOT WRITE IN THIS AREA

SHIP PREPAID TO ATTENTION OF RETURNED GOODS DEPARTMENT

USE ATTACHED LABEL

Beckman sales policies do not permit goods to be returned to the factory for credit, restocking or replacement under existing warranties, without prior authorization being received, including goods damaged in transit.

One copy of this authorization must be returned with the goods as a packing slip for proper identification on receipt at the factory. Indicate serial number of any instrument being returned.

When you receive your "Returned Goods Authorization" form enclose the packing copy, with the return shipment, and use the pretyped shipping label to insure delivery to the proper section. A copy of the "Returned Goods Authorization" is also included for your permanent records. Inspection reports stating specific problems must accompany goods being returned due to manufacturing defects. All shipments of return goods should be sent transportation prepaid.

File

STRNC-ZSR 20 February 1992

MEMORANDUM FOR Mr. Michael Perry, Material Classifier, I-ESD

SUBJECT: Radiation Survey Meter, Bar Code #05427

1. The above referenced GM Counter, Victoreen Instrument Company, Model No. 6B, has had the radioactive check source removed by Mr. John F. Sieckarski, ARPO. This source will be disposed IAW regulations issued by the U.S. Nuclear Regulatory Commission.

2. Request the above referenced non-serviceable GM Counter be processed through normal property disposal channels. Should you have any questions please contact Mr. Sieckarski, X-4758, or myself X-5208.

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
Mr. Dennis Martin, I-ESD
Mr. J.F. Sieckarski, ARPO, ISO

STRNC-ZSR (385-11e) 8 April 1992

MEMORANDUM FOR Mr. Michael Perry, Material Classifier, Storage & Services Branch, I-ESD

SUBJECT: Radiation Calibration Source, Packard Instrument Model No. B3255, Serial #27689, Bar Code #74453

1. Reference Contract #DAAK6090P2789, Packard Instrument Company, dated 9 August 1990.

2. On 7 April 1992 Mr. John F. Sieckarski, Alternate Radiation Protection Officer, and Mr. Jerry Stowell, Packard Instrument Company, Field Service Representative, removed the radioactive calibration source from the above referenced scintillation counter.

3. I am providing you with a photocopy of the Field Service Report, enclosed, for your records and to close out the above referenced contract. Additionally, since this equipment now does not contain any radioactive material, it can be processed through property disposal channels.

4. Should you have any questions, please contact Mr. Sieckarski, X-4758, or myself, X-5208.

Encl

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
Mr. John Sieckarski, ARPO, ISO (w/encl)
Mr. J. Dennis Martin, Chief, Storage & Services Br, I-ESD (w/encl)
Radiation Folder (w/encl)

Sanborn Company | JOHN STECKAWSKI | 508-651-4758

RECEIPT FOR SERVICE

BILL TO: KATHLEEN WILDER

DEPARTMENT: NATICK PROCUREMENT DIV.

INSTITUTION'S NAME: U.S. ARMY NATICK R&D CTR

ADDRESS: KANSAS ST.

CITY: NATICK STATE: MA COUNTRY: ZIP: 01760-5011

DIST	TERR	ZONE	PAYEE NO.	CUSTOMER NUMBER	SERVICE ORDER #
432	06	1	02095	82770000	6 210927

PACKARD SYSTEM SERIAL NUMBER: A3255 -027689

RIC SYSTEM SERIAL NUMBER: 9

CALL NUMBER:

COPY TO:

DATE OF SERVICE MO	DAY	YEAR	SERVICE HOURS	TRAVEL HOURS
4	7	92	10	10
TOTALS			10	10

ITEM #	PART NUMBER OF REPLACED ITEM	PART DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL PRICE
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

PARTS TRANSFER ITEM _____ PAYEE # _____

TOTAL MATERIAL

SUMMARY OF CHARGES TO CUSTOMER

ITEM	HOURS	RATES	CHARGES
ZONE 1 MIN.	10	290	290 —
LABOR			
SUB TOTAL			290 —
MATERIAL			
SHIPPING CHARGES			
VENDOR CHARGES			
SUB TOTAL			—
TRAVEL			
TAX			
MISC.			
TOTAL			$290 —

EXPLANATION: Removed RA 226 SOURCE 20NG FROM SYSTEM FOR SCRAPPING OR STORAGE.

CUSTOMER'S P.O. (IF MISSING EXPLAIN): DAAK 6090 P2789

CUSTOMER SIGNATURE: John T. Steckawski

TSE SIGNATURE: Jim Stowell

REASON FOR SERVICE

PRIMARY	SECONDARY	TYPE OF SERVICE
0 OPERATOR ERROR	0 INCORRECT OPERATION	44 LOAN
1 POWER SUPPLY	1 OUTSIDE SYSTEM SPECS.	47 SHOW
2 MECHANICAL/ ELECTROMECHANCIAL	2 ADJUST	48 LEASE
3 ANALOG	3 REPAIR	50 WARRANTY
4 DIGITAL	4 REPLACE	51 ENG. CHANGES
5 SOFTWARE & FIRMWARE	5 MECHANICAL	55 INSTALLATION
6 UPDATE	6 ANALOG	56 CUST. ACCOMMODATIONS
7 NO PROBLEM FOUND	7 DIGITAL	63 SALES. ASSIST
	8 SOFT & FIRMWARE	64 MAIN. CONTRACT
	9 OTHER (PLEASE EXPLAIN)	68 BILLABLE SERVICE
		69 PREVENTATIVE MAINTENANCE
		70 CALL BACK
		71 SALE

77 68

^{3}H EFF. _____ BKG. _____

^{14}C EFF. _____ BKG. _____

^{125}I EFF. _____ BKG. _____

CUSTOMER COPY

Natick Acquisition Center
U. S. Army Natick RD&E Center
ATTN: STRNC-PS
Natick, MA 01760-5011

MEMO FOR Safety - Paul Angelis DATE 3-3-92

SUBJECT: RECEIVING REPORT CLOSEOUT

PURCHASE REQUEST NO. W13G07-0149-0102

PURCHASE ORDER NO. DAAK60-90-P-2789

REQUEST STATUS ON THE ABOVE CITED PURCHASE ORDER.

IF ITEMS HAVE BEEN RECEIVED, PLEASE CHECK THE FOLLOWING:

ORDER COMPLETE _____ DATE COMPLETED _____

ORDER PARTIAL _____

SIGNATURE _____

IF ITEMS HAVE NOT BEEN RECEIVED, PLEASE COMMENT AND RETURN TO PROCUREMENT.

POINT OF CONTACT K Wilder 4124

1. CONTRACT/PURCH ORDER NO.	2. DELIVERY ORDER NO.	3. DATE OF ORDER	4. REQUISITION/PURCHASE NUMBER	
DAAK6090P2789		08/09/90	W13G0701490102	DER DMS REG 1 DO

5. ISSUED BY CODE B41
NATICK PROCUREMENT DIVISION
ARMY NATICK RD&E CENTER
ATTN: AMSTR-PNS/B41
NATICK, MA 01760-5011
KATHLEEN WILDER (508)-651-4124

7. ADMINISTERED BY CODE NOTE
NOTE TO VENDOR: Direct any inquiries to the Purchasing Agent/Contract Specialist indicated in Block #6.

8. DELIVERY FOB
[X] DEST
[ ] OTHER
(see schedule if other)

9. CONTRACTOR CODE 00001372 FACILITY CODE
NAME AND ADDRESS PACKARD INSTRUMENT CO
2200 WARRENVILLE RD
DOWNERS GROVE, IL 60515-

10. DELIVER TO FOB POINT BY 08/20/90

11. MARK IF BUS. IS
[ ] SMALL
[ ] SMALL DISADVANTAGED
[ ] WOMEN-OWNED

12. DISCOUNT TERMS 0 % 0 Net 30

13. MAIL INVOICES TO SEE BLOCK 15

14. SHIP TO CODE WHSE20
ACCT PROP OFCR - WHSE #20
US ARMY NATICK RD&E CENTER
KANSAS STREET
NATICK, MA 01760-5000 DAAK6090P2789

15. PAYMENT WILL BE MADE BY CODE CA
COMMERCIAL ACCOUNTS OFFICE
US ARMY NATICK RD&E CENTER
ATTN: STRNC-CFPC 508/651-4242
NATICK, MA 01760-5010

MARK ALL PACKAGES AND PAPERS WITH CONTRACT OR ORDER NUMBER

16. DELIVERY [ ] This delivery order is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.

PURCHASE [X] Reference your ORAL/JERRY 8/9/90 furnish the following on terms specified herein.

ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

NAME OF CONTRACTOR | SIGNATURE | TYPED NAME AND TITLE | DATE SIGNED

[ ] If this box is marked, supplier must sign Acceptance and return the following number of copies:

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
2102040 068-8430 P665896-2515 S19129 CC: 0019058N700002515

18. ITEM NO.	19. SCHEDULE OF SUPPLIES/SERVICE	20. QUANTITY ORDERED/ ACCEPTED*	21. UNIT	22. UNIT PRICE	23. AMOUNT
0001	"THE CLAUSES/PROVISIONS ATTACHED, PAGES 1-12, DATED 4 JUNE 1990 ARE INCORPORATED INTO THIS PURCHASE ORDER AS THEY APPLY." SERVICES: CONTRACTOR SHALL REMOVE RADIOACTIVE CHECK SOURCE FROM PACKARD INSTRUMENT MODEL NO. B3255 SERIAL NO. 27689	1	SV	240.000000	240.00

*If quantity accepted by the Government is same as quantity ordered, indicate by x. If different, enter actual quantity accepted below quantity ordered and encircle.

24. UNITED STATES OF AMERICA
BY: X Nancy G. Van Heest CONTRACTING/ORDERING OFFICER

25. TOTAL 240.00

29. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN
[ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

DATE | SIGNATURE OF AUTHORIZED GOVERNMENT REP.

27. SHIP. NO.
[ ] PARTIAL
[ ] FINAL

28. D.O. VOUCHER NO.

30. INITIALS

31. PAYMENT
[ ] COMPLETE
[ ] PARTIAL
[ ] FINAL

32. PAID BY

33. AMT VERIFIED CORRECT FOR

34. CHECK NUMBER

35. BILL OF LADING NO.

36. I certify this account is correct and proper for payment

DATE | SIGNATURE AND TITLE OF CERTIFYING OFFICER

37. REC'D AT	38. RECEIVED BY	39. DATE REC'D	40. TOTAL CONT.	41. S/R ACCOUNT NUMBER	42. S/R VOUCHER NO.

PACKARD INSTRUMENT CO

SERVICES TO BE PERFORMED AT NATICK RD & E CENTER

NOTE TO CONTRACTOR: PLEASE CO-ORDINATE REMOVAL OF RADIOACTIVE CHECK SOURCE WITH PAUL ANGELIS. SAFETY OFFICE, 508-651-5208.

SATNC-ZSR (385-11e) 4 January 1993

MEMORANDUM FOR

Ms. Donna Stok, Chief, Stock Division, I-ESD
Mr. J. Dennis Martin, Chief, Storage & Services Br, I-ESD
Mr. Michael Perry, SSB, I-ESD
Mr. Darrell Morrill, SSB, I-ESD

SUBJECT: Excess Property Containing Radioactive Materials

1. Reference memorandum AMCSF-P, 3 December 1992, SAB, enclosed.

2. This Installation has Army property, military and commercially available, which contains radioactive materials. Additionally, in the past this office has removed or contracted for the removal from equipment the radioactive material prior to transfer of excess property through proper channels.

3. Unauthorized transfer of radioactive material within equipment, whether specifically licensed by the U.S. Nuclear Regulatory Commission (NRC) to this Installation or under a manufacturer's "General License", could subject this Installation to adverse publicity and legal action by the NRC, reference 1. An incident similar to the above nearly occurred recently at this Installation. To preclude this from re-occurring request all items of equipment, military and commercially available laboratory, be carefully reviewed for radioactive materials prior to being transferred as excess property.

4. Should you have any questions regarding specific items of equipment and radioactive materials, please contact me at X-4758.

John F. Sieckarski

JOHN F. SIECKARSKI
Alt Radiation Protection Officer
Installation Safety Office

Encl

CF:
Paul G. Angelis, C, ISO

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY MATERIEL COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA 22333 - 0001

REPLY TO
ATTENTION OF

AMCSF-P

3 December 1992

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Excess Property Containing Radioactive Materials

1. Reference AR 700-64, April 1985, Radioactive Commodities in the DoD Supply System.

2. An incident occurred recently involving a military vehicle sold to a civilian recycling yard. The vehicle was equipped with instruments which contained radium paint. The recycling yard's radiation monitors were tripped when the vehicle was brought into the yard. The gauges were removed and disposed of without further problems by Army personnel dispatched to the site.

3. Referenced regulation, paragraph 5-15, requires that the services disposing of excess property will determine which commodities and spare parts are radioactive, and will screen radioactive items in accordance with current Federal Property Management Regulations. Radioactive materials are, in most cases, not authorized for transfer to public sale. Proper procedures were apparently not followed in this case, since the vehicle containing radioactive gauges was sold to a non-DoD concern.

4. Sensitivity to radioactive material disposal on the part of the general public is increasing, as evidenced by the installation of the radiation monitors in the recycling yard. Incidents like the one described above negatively impact upon the Army's reputation with the general public, and could subject to the Army to legal action by various governmental agencies. Therefore, request all organizations which are involved in the disposition of excess Army property review current screening procedures and take appropriate actions ' ensure compliance with referenced regulation.

5. Further request that AMC and major command headquarters elements make this a special subject for review at FY 93 and FY 94 radiation protection surveys/inspections/audits. Coordination with HQ Defense Logistics Agency, ATTN: DLA-WH, which oversees the Defense Reutilization and Marketing Offices, is encouraged.

6. Your cooperation in this matter is appreciated. Point of contact is John Manfre, DSN 284-9340.

7. AMC -- America's Arsenal for the Brave.

FOR THE COMMANDER:

JOHN E. RANKIN
Chief
Safety Office

DISTRIBUTION:

SATNC-ZSR (385-11e) 8 February 1993

MEMORANDUM FOR RECORD

SUBJECT: Transfer of Radioactive Material, P-32

1. Reference meeting Wednesday, 27 January 1993, Messrs. Steven Arcidiacono, SSD, Patrick Brown, Worcester Polytechnic Institute, Paul G. Angelis, RPO, and John F. Sieckarski, ARPO; SAB.

2. The above referenced meeting was held to discuss the procedure and necessary requirements to transfer 1 mCi of P-32 from SSD to Worcester Polytechnic Institute (WPI) for use by Mr. Patrick Brown as a student volunteer supporting Mr. Steven Arcidiacono's investigations. It was agreed that the proposal appeared do-able with the concurrence and approval of the WPI Radiation Protection Officer (RPO).

3. Based upon information provided by Mr. Brown, a Ms. Kimberly Beagle, RPO at WPI, was contacted by telephone on 28 January 1993 and this proposal was presented for her consideration. Subsequently Mr. Brown was requested to submit and obtain WPI Radiation Safety Committee's approval for this use of P-32.

4. Ms. Beagle called on Monday, 1 February 1993, to confirm WPI's approval for this proposed use of P-32 and provided a shipping address requesting Mr. Brown not be allowed to transport the radioactive material in his own personal vehicle. Agreement was provided and a review of Title 49, Code of Federal Regulations, Sections 172 and 173, was undertaken to determine Department of Transportation requirements for this shipment.

5. An extensive review of the above regulations identified the following information:

a. The A_2 quantity (the maximum activity of normal form radioactive material permitted in a Type A package) for P-32 is 30 Ci.

b. IAW Section 173.423 the Limited Quantity of Radioactive Materials for a liquid is 10^{-4} A_2 therefore the Material Package Limits for a strong tight container would be:

$$10^{-4} \times 30 \text{ Ci} = 0.03 \text{ Ci or } 30 \text{ mCi}$$

SATNC-ZSR (385-11e)
SUBJECT: Transfer of Radioactive Material, P-32

c. Since the shipment amount is less than 30 mCi, this shipment would be exempt package-limited quantity of mateials if the requirements of 173.421, 173.421-1 and 172.604 are met.

6. As a result of the above a Request for Turn-in, DA Form 3161, was developed to obtain a Government Bill of Lading, enclosure 1. This was provided to Mr. Arcidiacono for processing through the SSD Supply Officer on 2 February 1993. The intent is to "hand carry" the P-32 to WPI when the documentation is complete.

John F. Sieckarski
Alternate Radiation Protection Officer

Encl

CF:
Paul G. Angelis, RPO, ISO

NRC FORM 374
(10-89)

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Amendment No. 28

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 39, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Worcester Polytechnic Institute Open Pool Nuclear Reactor Facility 2. Mechanical Engineering Department Worcester, Massachusetts 01609	In accordance with letter dated December 21, 1990 3. License number 20-03680-02 is amended in its entirety to read as follows: 4. Expiration date April 30, 1993 5. Docket or Reference No 030-00775

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Any byproduct material with Atomic Nos. 1 through 83	A. Any	A. Not to exceed 100 millicuries per radionuclide, with half-life less than or equal to 40 minutes, and 2 curies total Not to exceed 50 millicuries per radionuclide, with half-life greater than 40 minutes but less than or equal to 20 hours, and 1 curie total Not exceed 1 millicurie per radionuclide, with half-life greater than 20 hours but less than or equal to 120 days, and 1 curie total Not to exceed 1 millicurie per radionuclide with half-life greater than 120 days, and 300 millicuries total
B. Hydrogen 3	B. Any	B. 260 millicuries
C. Carbon 14	C. Any	C. 30 millicuries
D. Phosphorus 32	D. Any	D. 30 millicuries

SSD M. VERNON/S. ARCHIDIACONO

DOC. IDENT.	RI FROM	M&S	STOCK NUMBER FSC	NIIN	ADD	UNIT OF ISSUE	QUANTITY	DOCUMENT NUMBER SERV	REQUISITIONER	DATE	SERIAL	SUFFIX	SERV	SUPPLEMENTARY ADDRESS	SIGNAL	FUND	DISTRIBUTION	PROJECT	PRIORITY	REQ'D DEL DATE	ADVICE	RI	UNIT PRICE DOLLARS	CTS.
			FSC-6810			EA	1		W13B07	3039	-A003												$110.00	

SHIPPED FROM: U.S. Army Natick RD&E Center
Logistics Office, LEHD
Kansas St., Natick, MA 01760
ATTN: STRNC-DLC

SHIP TO: WPI
WORCESTER, MA

MARK FOR

PROJECT

TOTAL PRICE DOLLARS CTS. $110.00

WAREHOUSE LOCATION | TYPE OF CARGO | UNIT PACK | UNIT WEIGHT | UNIT CUBE | UFC | NMFC | FREIGHT RATE | DOCUMENT DATE | MAT COND | QUANTITY | 1/1

SUBSTITUTE DATA (ITEM ORIGINALLY REQUESTED)

FREIGHT CLASSIFICATION NOMENCLATURE: C/R W13G07-3034-3210

ITEM NOMENCLATURE: (A-32P)dATP 1mCi, 37,000 bG

SHIPPERS USE

SELECTED BY AND DATE	TYPE OF CONTAINER(S)	TOTAL WEIGHT
	BX	5

PACKED BY AND DATE	NO. OF CONTAINER(S)	TOTAL CUBE
R.ROUSSEAU /08 FEB 93	1	1

RECEIVERS USE

RECEIVED BY AND DATE	INSPECTED BY AND DATE
12X12X12	

WAREHOUSED BY AND DATE	WAREHOUSE LOCATION

REMARKS: JUSTIFICATION TO ALLOW WORK TO OCCUR AT WPI IN SUPPORT OF COLLABORATION BETWEEN WPI & NATICK LABS.

Emergency Contact: John F. Sieckarski (508) 651-4758

FIRST DESTINATION ADDRESS: TRANSPORTATION COST ONLY

DATE SHIPPED: This package conforms to the conditions and limitations apecified in 49CFR 173,421 for radioactive material excepted package limited quantity of material, UN2910 X

3

13 TRANSPORTATION CHARGEABLE TO: NONE

14 B/LADING, AWB, OR RECEIVER'S SIGNATURE (AND DATE): [signature] 2/8/93

15 RECEIVER'S DOCUMENT NUMBER

DD Form 1348-1, SEP 87 Jun 86 edition may be used. FORM APPROVED. OMB NO. 0704-0188 DOD SINGLE LINE ITEM RELEASE/RECEIPT DOCUMENT

02/01/93
11:05

01760

ORDER NUMBER	PAGE
96805570	1

DU PONT

PAGE 1 OF

. Du PONT de NEMOURS & CO. INC.
EDICAL PRODUCTS DEPARTMENT
IOTECHNOLOGY DIVISION
ILMINGTON, DE. 19898

DELIVER TO:
U S ARMY NATICK LABORATORIES
PROP. OFCER. WHSE. # 20
KANSAS STREET
NATICK, MASSACHUSETTS 01760

PO/AYE
FEDERAL EXPRESS
WAREHOUSE #20
ISOTOPES: P32
TOT ACTIV 'Y: .046990 GBQ(.001270 C

ATTN:

)LD TO:

US GOVERNMENT
FINANCE & ACCTG OFFICER
1 KANSAS ST
NATICK MA 01760-2611

ORDER NUMBER	CUSTOMER P. O. NUMBER
96805570	DAAK6093P0326

SHIP TERMS	VIA	PAID	COL
FOB DESTINATION	AIR	X	

SHIPPING POINT DUPONT/NEN 549 ALBANY ST.
BOSTON, MA. 02118

; NO. 51-0014090

CUSTOMER NUMBER	SHIPMENT COMPLETE	SHIPMENT PARTIAL	TECH REP	CSR	LICENSE NUMBER	RADIATION AT SURFACE	INSPECTOR	PKG
)44550 001	X		127	DE	20-00315-02	.4122MR/HR	AL	DI

TRY DATE	SCHEDULED DATE	SHIPPING DATE	AR NUMBER	TAX LOCATION	TAX CLASS	REN	SALES CLASS
02/01/93	02/01/93	02/01/93	9224525	38520	00	09	01

IE).	QUANTITY ORDERED	QUANTITY SHIPPED	PART NUMBER	DESCRIPTION	PACKAGE SIZE	LOT/SERIAL NUMBER
)1	1	1	NEG002A 0117	ADENOSINE 5'-TRIPHOSPHATE TETRA-(TRIETHYLAMMONIUM)SALT [G-32P]-	1MC 37000KBQ	2822702A

2/2/93

/ QUESTIONS REGARDING THIS ORDER CALL: 800-551-2121 1,1 0493

SOTOPES: P32
O T LABEL: II YELLOW 4-A-02

REQUEST FOR ISSUE OR TURN-IN
(DA PAM 710-2-1)

✓ ISSUE / TURN-IN	SHEET NO. 1	NO. SHEETS 1	3. REQUEST NO. W13607-2317-3207
4. VOUCHER NO.			
1. SEND TO: APO USA Natick RD&E Center SATNC-DS Natick MA 01760-5031	5 DATE MATERIEL REQUIRED 30 Nov 92	6. DODAAC	7. PRIORITY 13
8. ACCOUNTING/FUNDING DATA 3 3250 02 030 A00 26EB			
2. REQUEST FROM: SSD Biotech Div D320 S. Arcidiacono 4983	9 END ITEM IDENT	9a. NAME/MANUFACTURER	9b. MODEL
9c. SERIAL NO.			
*CODE — ISSUE: I-Initial, R-Replacement; TURN-IN: FWT-Fair Wear And Tear, RS-Report of Survey, EX-Excess, SC-Stmt of charges	10. PUBLICATION	11. JOB ORDER NO.	

12.ITEM NO. a	STOCK NO. b	ITEM DESCRIPTION W13607-2317-3207	UNIT OF ISSUE d	QUANTITY e	CODE* f	SUPPLY ACTION g	UNIT PRICE h	TOTAL COST i	j. POSTED DATE	BY
01	6810	[γ32P] dATP 1microCi	EA	10		/	$91.00	$910.00		
		readioactive reagent NEG002A								
		DON'T SHIP! DELIVERY UPON								
		REQUEST OF PROJECT OFCR.					T. 2714			
		SOLE SOURCE;					DN			
		New England Nuclear					2/2/93			
		Boston, MA 02118								
		800-551-2121								
		SOLE SOURCE JUST:								
		NEN only supplier of radiation								
		of high specific activity								
		required by our researchers								
	CONCUR	JUSTIFICATION; Needed to								
	AC, Biotech Div	continue w/DNA experiments;								
	SSD	no radioactive material available					SHEET TOTAL $910.00		GRAND TOTAL $910.00	

NOTE: ONE COPY OF ALL PROCUREMENT DOCUMENTS ISSUED BASED ON THIS REQUEST MUST BE FURNISHED TO C, MSO, SSD.

SAFETY

13. ISSUE/TURN-IN "QUANTITY" COLM IS REQUESTED	DATE	BY	14. ISSUE QTY IN "SUPPLY ACTION" COLUMN	DATE	BY	15. REC QTY IN "SUPPLY ACTION" COLUMN	DATE	BY
	12 Nov 92	ROBIN MOORE Supply Clerk, MSO, SSD						

DA FORM MAY 83 3161-E

REPLACES EDITION OF JUN 73 WHICH WILL BE USED UNTIL EXHAUSTED.

EMORANDUM
OF CALL

Previous editions usable

Paul

YOU WERE CALLED BY– ☐ YOU WERE VISITED BY–

Steve A

(Organization)

PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

4983

WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

SAGE

EIVED BY Hazel DATE 2/2 TIME 9:45

0 NSN 7540-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
1990 O – 276-977 Prescribed by GSA
FPMR (41 CFR) 101–11.6

MEMORANDUM
OF CALL

Previous editions usable

TO: Paul

☑ YOU WERE CALLED BY– ☐ YOU WERE VISITED BY–

Steve A.

OF (Organization) SSN

☑ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

4983

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

Re: Paperwork WPI
Student

RECEIVED BY Hazel DATE 2/1 TIME 1:15

63-110 NSN 7540-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
GPO : 1990 O – 276-977 Prescribed by GSA
FPMR (41 CFR) 101–11.6

MEMORANDUM
OF CALL

Previous editions usable

TO: Paul

☑ YOU WERE CALLED BY– ☐ YOU WERE VISITED BY–

Pat Arnwn

OF (Organization)

☐ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

791– 8573

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

RECEIVED BY Hazel DATE 2/3 TIME 1:40

STANDARD FORM 63 (Rev. 8-81)

MEMORANDUM
OF CALL

Previous editions usable

TO: Paul

☐ YOU WERE CALLED BY– ☐ YOU WERE VISITED BY–

Steve A

OF (Organization)

☑ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

4983

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☑ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

RECEIVED BY DATE 2/2 TIME 9:45

STANDARD FORM 63 (Rev. 8-81)

MEMORANDUM OF CALL

Previous editions usable

TO: Paul

☐ YOU WERE CALLED BY— ☐ YOU WERE VISITED BY—

Kimberly Beagle

OF (Organization) WPI

☑ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

831-5688

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

Re: Pat Brown

RECEIVED BY Hazel | DATE 2/1 | TIME 12:35

63-110 NSN 7540-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
Prescribed by GSA
FPMR (41 CFR) 101—11.6

GPO : 1990 O - 276-977

Worcester Polytechnic Institute
100 Institute Rd
Worcester, MA 01609
ATTN: Dr. J.C. Bagshaw
Biology / Biotechnology Bldg.
Salisbury

RE EST FOR ISSUE OR TURN-IN
(DA PAM 710-2-1)

	ISSUE	SHEET NO. 1	NO. SHEETS
X	TURN-IN		

1. SEND TO:	5. DATE MATERIEL REQUIRED 8 February 1993	6. DODAAC	7. PRIORITY
2. REQUEST FROM:	9. END ITEM IDENT	9a. NAME/MANUFACTURER	9b. MODEL

3. REQUEST NO.	4. VOUCHER NO.	8. ACCOUNTING/FUNDING DATA	9c. SERIAL NO.
10. PUBLICATION		11. JOB ORDER NO.	

*CODE — ISSUE: I—Initial, R—Replacement; TURN-IN: FWT—Fair Wear And Tear, RS—Report of Survey; EX—Excess, SC—Stmt of Charges

12. ITEM NO. a	STOCK NO. b	ITEM DESCRIPTION c	UNIT OF ISSUE d	QUANTITY e	CODE* f	SUPPLY ACTION g	UNIT PRICE h	TOTAL COST i	j. POSTED DATE	BY
1	65316	[A-32P] dATP 1mCi	each	1			110.00	110.00		
		37000 kBq								
		Hand Carry								
	Ship To:	Worcester Polytechnic Institute								
		100 Institute Rd.								
		Worcester, MA 01609								
		Attn: Dr. J.C. Bagshaw								
	Justification:									
		This package conforms to the conditions and limitations								
		specified in 49 CFR 173.421 for radioactive material,								
		excepted package-limited quantity of material, UN2910.								
							SHEET TOTAL		GRAND TOTAL	

13. ISSUE/TURN-IN "QUANTITY" COLM IS REQUESTED	DATE	BY	14. ISSUE QTY IN "SUPPLY ACTION" COLUMN	DATE	BY	15. REC QTY IN "SUPPLY ACTION" COLUMN	DATE	BY

DA FORM 3161 MAY 83

REPLACES EDITION OF JUN 73 WHICH WILL BE USED UNTIL EXHAUSTED.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1983-407-261

REQUEST FOR ISSUE OR TURN-IN

(DA PAM 710-2-1)

ISSUE	TURN-IN	SHEET NO.	NO. SHEETS
XX		1	

3. REQUEST NO.

4. VOUCHER NO.

1. SEND TO: APO US ARMY NATICK RD&E CENTER
ATTN: SATNC-DLM NATICK, MA 01760

5. DATE MATERIEL REQUIRED

6. DODAAC

7. PRIORITY

8. ACCOUNTING/FUNDING DATA
3029058N700002217

2. REQUEST FROM: PAUL G. ANGELIS- SATNC-ZSR
INSTALLATION SAFETY OFFICE

9. END ITEM IDENT

9a. NAME/MANUFACTURER

9b. MODEL

9c. SERIAL NO.

*CODE ISSUE
I--Initial
R--Replacement

TURN-IN
FWT--Fair Wear And Tear
RS--Report of Survey

EX--Excess
SC--Stmt of Charges

10. PUBLICATION

11. JOB ORDER NO.

12. ITEM NO. a	STOCK NO. b	ITEM DESCRIPTION c	UNIT OF ISSUE d	QUANTITY e	CODE* f	SUPPLY ACTION g	UNIT PRICE h	TOTAL COST i	j. POSTED DATE	BY
1	6665-01-105-5623	M8A1 Chemical Agent	each	1			2357.00	2357.00		
		Alarm, Lot No. 007, Serial #07267, containing 250mCi Am-241 Special Form								
2	6665-01-105-5623	M8A1 Chemical Agent								
		Alarm, Lot No. 007, Serial #02333, containing 250mCi AM-241 Special Form								
		Ship To:								
		U.S. Army Chemical Biological Defense Agency								
		ATTN: SCBRD-ENO-PM								
		Edgewood Arsenal, Bldg E3549								
		Aberdeen Proving Ground, Md 21010-5423								
	This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material									
	excepted package instruments or articles, UN 2910.									
	EMERGENCY CONTACT: 508-651-4758 John Sieckarski									
							SHEET TOTAL		GRAND TOTAL	

13. ISSUE/TURN-IN "QUANTITY" COLM IS REQUESTED	DATE	BY	14. ISSUE QTY IN "SUPPLY ACTION" COLUMN	DATE	BY	15. REC QTY IN "SUPPLY ACTION" COLUMN	DATE	BY
	23 Feb 1993	Samuel P. Blake, Sr. Property Officer /MH Perry/						

DA FORM 3161 MAY 83

REPLACES EDITION OF JUN 73 WHICH WILL BE USED UNTIL EXHAUSTED.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1983-407-261

SHIPPERS CERTIFICATION
(For Surface Shipment)

This consignment is within the limitations prescribed for surface shipment.

Number of Packages	49 CFR Paragraph	Proper Shipping Name	Net Quantity Per Package		
			Pieces	Weight	Volume
1 BX	173.421	RADIOACTIVE MATERIAL, LIMITED QUANTITIES, N.O.S. UN 2910	1	30	500 mCi
EMERGENCY	TELEPHONE NUMBER:	508-651-4758 JOHN SIECKARSKI			

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Name and address of shipper or his authorized agent: ~~US ARMY NATICK RD&E CENTER~~
~~KANSAS STR., NATICK, MA 01760-5030~~

Signature: SANDRA J. FITCH, TRAFFIC MANAGER
508-651-4236

Date: ~~9 MARCH 1993~~

NATICK Form 1067
1 Jan 79

SATNC-ZSR (385-11e) 17 March 1993

MEMORANDUM FOR RECORD

SUBJECT: Shipment of M8A1 Chemical Agent Alarm

1. Reference M8A1 Chemical Agent Alarms, NSN 6665-01-105-5623, Lot No. 007, Serial #07267 and #02333.

2. The above referenced items which each contain 250 mCi Am-241 were "discovered" by a Natick Project Officer who did not want them nor knew exactly what to do, gave them to this office for proper disposition.

3. Initial contact with HQ AMCCOM Safety Office personnel and subsequent discussions with Mr. Cliff Gerich, Materiel Manager's Office, concluded that:

a. These items were probably preproduction prototypes, due to the unusual lot and serial number identification.

b. It was unknown whether these M8Als were manufactured IAW the item specification used for Type Classified M8Als.

c. Based upon the above the Material Manager's Office could not accept these M8Als for reissue and use.

4. As a result of these conversations it was determined that the Material Developer, U.S. Army Chemical Biological Defense Agency (CBDA), APG, would have radiation responsibility for these prototype M8Als. Subsequently Mr. Gerich and Mr. Daniel Liedtke, also from HQ AMCCOM, provided me with a POC, Ms. Lisa Foust, at CBDC, who agreed to accept these items.

SATNC-ZSR (385-11e)
SUBJECT: Shipment of M8A1 Chemical Agent Alarm

5. A review of Department of Transportation Regulations, Title 173, CFR, Subpart 1- Radioctive Material identified the following information:

a. The A_1 quantity (the maximum activity of special form I&A radioactive material permitted in a Type A package) for Am-241 is 8 Ci.

b. IAW Section 173.423 the Limited Quantity of radioactive material for an instrument and article special form is $E\text{-}2A_1$, therefore the Material Package Limit for a strong tight container would be:

$$10^{-2} \times 8 \text{ Ci} = 0.08 \text{ Ci or } 80 \text{ mCi}$$

c. Since each M8A1 contains 250 uCi of Am-241, this shipment would qualify as a exempt package-limited quantity of radioactive materials if the requirements of Sections 173.421, 173.421-1 and 172.604 are met.

6. As a result of the above a Request for Turn-in, DA Form 3161, (enclosure 1) was developed to obtain a Government Bill of Lading. This was forwarded through supply, transportation and warehousing, then the M8A1s were shipped on 11 March 1992.

John F. Sieckarski
Alternate Radiation Protection Ofcr

Encl

CF:
Paul G. Angelis, ISO

RADIOACTIVE MATERIALS MOVEMENT

☒ SHIPMENT ☐ RECEIPT

For use of this form, see AR 55-55; the proponent agency is Office of the Deputy Chief of Staff for Logistics.

(See instructions on reverse.)

DETAILS OF SHIPMENT

1. TO: (Include ZIP Code) U.S. Army Natick Research Development & Engineering Center, ATTN: SAT NC-ZSR (Paul Angelus John Sieckarski) Natick, MA 01760-5033

2. FROM: (Include ZIP Code) U.S. Army Research Laboratory Caretaker Force, ATTN: AMSRL-OP-WT-PK (Peter Cometto), 395 Arsenal St, Watertown, MA 02172-2700

3. SHIPMENT NUMBER: 96-04

4. SECURITY CLASSIFICATION: NONE

5. MODE OF SHIPMENT (i.e., Railway Express): Private Auto

6. COMMODITY DESCRIPTION / 7. RADIOACTIVITY

CONTAINERS a	NUMBER OF ITEMS b	NOMENCLATURE c	QUANTITY, ISOTOPE AND FORM a	b. LEVEL AT SURFACE	b. LEVEL AT ONE METER
1	1	Radioactive Material, excepted package-limited quantity of Material, Hazard Class 7, UN 2910	36 nCi (HE4 dpm) Am-241		
~~1~~	~~4~~	"	~~Four, 1 μCi Cs-137 check sources~~		

SHIPMENT

THE ABOVE DESCRIBED ARTICLES ARE PROPERLY CLASSIFIED, PACKAGED, MARKED, AND LABELED. THE ARTICLES ARE IN PROPER CONDITION FOR TRANSPORTATION AND THE SPREADABLE ACTIVITY AND DOSE RATES ARE WITHIN THE SPECIFIED LIMITS, AS PRESCRIBED BY APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION AND DEPARTMENT OF THE ARMY.

8. REMARKS

§ 32.58 Same: Labeling of devices.

Each person licensed under § 32.57 shall affix to each source, or storage container for the source, a label which shall contain sufficient information relative to safe use and storage of the source and shall include the following statement or a substantially similar statement which contains the information called for in the following statement: [1]

The receipt, possession, use and transfer of this source, Model ——, Serial No. ——, are subject to a general license and the regulations of the United States Nuclear Regulatory Commission or of a State with which the Commission has entered into an agreement for the exercise of regulatory authority. Do not remove this label.

CAUTION—RADIOACTIVE MATERIAL—THIS SOURCE CONTAINS AMERICIUM 241. DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE.

9. SPECIAL PRECAUTIONS

10. SIGNATURE OF RADIATION PROTECTION OFFICER (Shipping Organization): Peter Cometto — DATE

11. SIGNATURE OF TRANSPORTATION OFFICER (Shipping Organization) — GRADE AND TITLE — DATE

12. ORGANIZATION

DA FORM 2791-R, 1 Oct 70 — REPLACES DA FORM 2791, 1 JUN 64, WHICH IS OBSOLETE.

STRAIGHT BILL OF LADING-SHORT FORM
Original-Not Negotiable

Carrier's No.

Name of Carrier: Peter Cornetta

SCAC

Date

TO: Consignee: Paul Angelus or John Sieckarski

FROM: Shipper: U.S. Army Research Laboratory

Street

Street: Care Taker Face, 395 Arsenal Street

Destination

Zip

Origin: Watertown, MA

Zip: 02172-2700

Route:

Vehicle Number

No. Shipping Unit	HM	Kind of Packages, Description of Articles (IF HAZARDOUS MATERIALS-PROPER SHIPPING NAME)	HAZARD CLASS	Un or NA Number	WEIGHT (subject to correction)	LABELS REQUIRED (or exemption)
96-04		Radioactive Material, excepted	7	2910		Radioactive on outside of inner
		package - limited quantity of				package
		material, Hazard Class 7,				
		u				

EMERGENCY CONTACT (EMERGENCY RESPONSE INFORMATION ATTACHED) Guide

LAN# _____ 741# _____ TID(s) _____

Where the rate is dependent on value, shippers are required to state specifically, in writing, the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceding

$ _____ Per _____

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement. The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

_____ (Signature of Consignor)

FREIGHT CHARGES

Prepaid ☒

Collect ☐

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described above is in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

SHIPPER hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

PER: _____

PLACARDS REQUIRED

PLACARDS SUPPLIED ☐ YES ☐ NO, FURNISHED BY CARRIER

Special Instructions

DRIVER'S SIGNATURE (x)

SHIPPER:

CARRIER:

PER:

PER:

DATE:

DATE:

FORM 997 (2/91)

CONSIGNEE

U.S. GOVERNMENT BILL OF LADING

MEMORANDUM COPY

B/L NO. ▶ D-1,983,844

1. TRANSPORTATION COMPANY TENDERED TO
ST JOHNSBURY TRUCKING COMPANY INC

2. SCAC
SJTC

3. DATE B/L PREPARED
930309

4. ROUTE ORDER/RELEASE NUMBER

5. DESTINATION (Name, address and ZIP code)
ABERDEEN PROVING GROUND-EDGEWOOD AREA
BLDG E3549
ABERDEEN PROVING GROUND, MD 21010-5423

6. SPLC (Dest.)
231582250

7. SPLC (Orig.)
141630250

8. ORIGIN (Name, address and ZIP code)
US ARMY NATICK RD&E CENTER
KANSAS STR., WHSE 20
NATICK, MA 01760-5030

9. CONSIGNEE (Name, address and ZIP code of installation)
ABERDEEN PROVING GROUND-EDGEWOOD AREA
BLDG E3549
ABERDEEN PROVING GROUND, MD 21010-5423

10. GBLOC (Cons.)
BAAM

11. SHIPPER (Name, address and ZIP code)
TRANSPORTATION OFFICER
US ARMY NATICK RD&E CENTER
KANSAS STR., NATICK, MA 01760-5030

12. APPROPRIATION CHARGEABLE CC: 3023958N700002217
21 3 2040 36T-6T06 P665896 2217 S19129

13. BILL CHARGES TO (Dept./agency, bureau/office mailing address and ZIP code)
TRANSPORTATION OPERATIONS
US ARMY FINANCE & ACCTING CTR
INDIANAPOLIS, IN 46249-0601

AGENCY LOC CODE

14. VIA (Route shipment when advantageous to the Government)

15. MARKS AND ANNOTATIONS (If extra services are ordered, see Administrative Directions No. 2 on reverse)
M/F: U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE AGENCY
BLDG E3549
ATTN: SCBRD-ENO-PM

16. PACKAGES NO.	KIND	17. HM	18. DESCRIPTION OF ARTICLES (Use carrier's classification or tariff description if possible; otherwise use a clear nontechnical description)	19. WEIGHT* (Pounds only)	FOR USE OF BILLING CARRIER ONLY: Services	Rate	Charges
1	BX		CLASSIFICATION ITEM NO. 43940 CHEMICALS, NOI, UN 2910 (M3A1 CHEMICAL AGENT/RADIOACTIVE MATERIAL ALARM, LOT NO. 007, SERIAL #07267/02333, CONTAINING 250mCi Am-241 SPECIAL FORM) "THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.421 FOR RADIOACTIVE MATERIAL EXCEPTED PACKAGE INSTRUMENTS OR ARTICLES, UN 2910" EMERGENCY TELEPHONE 508-651-4758	30			

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION, ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

SHIPPER'S SIGNATURE

TOTAL CHARGES

20. TARIFF/SPECIAL RATE AUTHORITY
SJTC000215 TENDER SOP 02

21. PICKUP SERV. FURNISHED ☐ YES
VEHICLE FULLY LOADED ☐ YES

SHIPPER'S INITIALS

22. CARRIER WAY/FREIGHT BILL NO. AND DATE

23. STOP THIS SHIPMENT AT

FOR:

24. FURNISH INFORMATION ON CAR/TRUCKLOAD/CONTAINER SHIPMENTS

INITIALS & NO.	SEAL NUMBERS	LENGTH/CUBE ORDERED	LENGTH/CUBE FURNISHED	MARKED CAPACITY ORDERED	MARKED CAPACITY FURNISHED	DATE FURNISHED
	APPLIED BY:					

25. CARRIER'S PICKUP DATE (Year, month, & day)
/ /

26a. SIGNATURE OF AGENT

26b. PER

B/L NUMBER
D-1,983,844

27. MODE	28. ESTIMATE	29. NO. OF CLS/TLS	30. TYPE RATE	31. PSC	32. REASON
AX	36				

Received by the transportation company named above, subject to conditions named on the reverse hereof, the property hereinafter described, in apparent good order and condition (contents and value unknown), to be forwarded to destination by the said company and connecting lines, there to be delivered in like good order and condition to said consignee.

FOR USE OF ISSUING OFFICE

33a. ISSUING OFFICE (Name and complete address)
US ARMY NATICK RD&E CENTER
KANSAS STR., WHSE 20
NATICK, MA 01760-5030

33b. GBLOC
AGAV

33c. ISSUING OFFICER
SANDRA J. FITCH, TRAFFIC MANAGER 508-651-4236

34d. DELIVERED THIS CONSIGNMENT COMPLETE & IN APPARENT GOOD ORDER EXCEPT AS MAY BE INDICATED ☐ SHORTAGE ☐ DAMAGED

33d. CONTRACT/PURCHASE ORDER NO. OR OTHER AUTHORITY AUTH ASD# W13007-3055-0101

33e. DATED

33f. FOB POINT NAMED IN CONTRACT

SATNC-ZSR (385-11E) 12 March 1993

MEMORANDUM FOR Ms. Kate O'Brien, USARIEM

SUBJECT: Vasopressin I-125 RIA KIT, Return Shipment

1. Reference: Contract #DAAK6093P0923, 6- Vasopressin I-125 RIA Kits, 1uCi I-125/kit.

2. Kate, in response to our telephone conversation of Thursday, 11 March 1993, I reviewed the Department of Transportation Regulations, Title 173, CFR, Subpart 1 - Radioactive Material. A review of these regulations identified the following information:

a. The A2 quantity (the maximum activity of normal form radioactive material permitted in a Type A package) for I-125 is 70Ci.

b. IAW Section 173.423 the activity limits - excepted quantities of radioactive materials for a liquid is E-4 A2, therefore, the Material Package Limits for I-125 normal form in a strong tight container (cardboard box) would be:

$$10^{-4}\ 70\text{Ci} = 0.07\ \text{Ci or } 70\ \text{mCi}$$

c. Additionally, this radioactive material could be considered Low Specific Activity (LSA) Material if the concentration does not exceed 0.3 mCi per gram since the A2 quantity is more than 1 Ci.

3. So as to comply with the requirements of 173.421, 173.421-1, and 172.604 the Government Bill of Lading must contain the following information:

"This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package-limited quantity of material, UN2910."

"EMERGENCY CONTACT: 1-508-651-4758
Mr. John Sieckarski"

4. Should you have any questions, please contact me at X-5208.

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
Mr. John Sieckarski, ARPO, ISO

INCSTAR

Science, Technology and Research

PRODUCT LINES:
INCSTAR®
SORIN
CLINICAL ASSAYS™
ATLANTIC ANTIBODIES
CLINICAL SCIENCES

INCSTAR CORPORATION
P.O. BOX 285
1951 NORTHWESTERN AVE.
STILLWATER, MN 55082
CORPORATE OFFICE: 612-439-8710
CUSTOMER SERVICE: 800-328-1482
TELEX: 6879023 INUCUW
FAX: 612-779-7847

PACKING SLIP

FOR SCHEDULED SHIPMENTS 03/09/93 THROUGH 03/09/93

SALES ORDER NUMBER: 60330 RVSN:

SHIP-TO: 10578-1
US ARMY NATICK RES. & DEV.
SATNC-DSW (KANSAS ST)
ACCT PROP OFCR WHSE 20
DAAK6093P0923
NATICK, MA
USA 01760

BILL-TO: 10578
US ARMY NATICK RES. & DEV.
FINANCE & ACCOUNTING OFFICE
KANSAS STREET
NATICK, MA
USA 01760

P.O. NUMBER: DAAK6093P0923
CONTRACT NUMBER: MAIL/508 651 4242
FREIGHT TERMS: PPD, FOB STILLWATER
METHOD OF SHIPMENT: FED X ECONOMY SERV.
PAYMENT TERMS: NET 30
BILL OF LADING:
SHIPMENT DATE:
WAREHOUSE: STOCK

SHIPPING & HANDLING $25.00
ORDER TAKEN BY BRENDA KALKA

LIN	PRODUCT/ PART NUMBER	DESCRIPTION	UM	QTY PER PRODUCT	STAGED QTY. PICK QTY	STAGING LOCATION	LOCATION	LOT	PULL
1	23065 (2300-65)	VASOPRESSIN I125	EA		6.000		027312	[illegible]	
							027312	080233	6

T 3859
3/11/93 R

PURCHASE REQUEST AND COMMITMENT
For use of this form, see AR 37-108: the proponent agency is USAFAC.

PURCHASE INSTRUMENT NO.	REQUISITION NO.	DATE	PAGE OF PAGES
181NLC	3011-2001		

TO:	THRU:	FROM:
Purchasing and Contracting Officer	Supply & Storage, NRDEC	USARIEM, Natick, MA 07160-5007

It is requested that the supplies and services enumerated below or on attached list be:

PURCHASED FOR	DELIVERED TO	NOT LATER THAN (Date)
Commander, USARIEM	Kate O'Brien, ext 4873, ARIEM 210	PD13/20 JAN 92

The supplies and services listed below cannot be secured through normal supply channels or other Army supply sources in the immediate vicinity, and their procurement will not violate existing regulations pertaining to local purchases for stock, therefore, local procurement is necessary for the following reason: *(Check appropriate box and complete item.)*

NAME AND TELEPHONE NO. OF PERSON TO CALL FOR ADDITIONAL INFORMATION: CPT Scott Montain, X5142
Kate O'Brien, ext 4873

LOCAL PURCHASES AUTHORIZED AS THE NORMAL MEANS OF SUPPLY FOR THE FOREGOING BY

REQUISITIONING DISCLOSES NONAVAILABILITY OF ITEMS AND LOCAL PURCHASE IS AUTHORIZED BY

EMERGENCY SITUATION PRECLUDES USE OF REQUISITION CHANNELS FOR SECURING ITEM

3VF Fund Certification WU: 141

The supplies and services listed on this request are properly chargeable to the following allotments, the available balances of which are sufficient to cover the cost thereof, and funds have been committed.

ITEM	DESCRIPTION OF SUPPLY OR SERVICES	QUANTITY	UNIT	ESTIMATED Unit Price	ESTIMATED Total Cost
1.	Vasopressin 125I RIA kit, 65 tubes, cat# 23065 , 1 uCi/kit ** Critical: Short shelf life ** Will call when needed	6	KT	455.00	2,730.00
				GRAND TOTAL:	$2,730.00

SOURCE:
INCSTAR Corporation
1990 Industrial Blvd.
PO Box 285
Stillwater, MN 55082-0285
ph: 612-439-9710

ACCOUNTING CLASSIFICATION	AMOUNT
2132040 375-8103 P612787.879 26EB S19129 CC 3440185VF3A00 26EB EXP 30 Sep 93	$2730.00

DATE	TYPED NAME AND TITLE OF CERTIFYING OFFICER	SIGNATURE
20 Jan 93	VIOLET M. TRAINER Certifying Officer	[signature] COMPLETE

DISCOUNT: T 3859 3/11/93 DS

PURCHASE ORDER NUMBER: RADIOACTIVE MATERIAL
Approved for Purchase Under
BML 20-315-2
RPO Ref. No. A-54-U

DELIVERY SCHEDULE: [signature] 1/8/92
Radiation Protection Officer

THE FOREGOING ITEMS ARE REQUIRED NOT LATER THAN AS INDICATED ABOVE FOR THE FOLLOWING PURPOSE: Required for analysis of vasopressin in samples collected under an approved protocol currently running.

DATE	TYPED NAME AND GRADE OF INITIATING OFFICER	SIGNATURE
1-5-93	Michael N. Sawka, GM-15 TELEPHONE NO. 5320	Mike Sawka
25JAN93	Tim J. Jardine, CPT, MS	[signature]

Approved by commanding officer or his designee

DATE	TYPED NAME AND GRADE OF COMMANDING OFFICER OR DESIGNEE	SIGNATURE
22JAN93	GERALD P. KRUEGER COL, MS COMMANDING	[signature]

DA FORM 1 AUG 76 3953

PREVIOUS EDITIONS OF THIS FORM WILL BE USED UNTIL EXHAUSTED.

Fri 18 Dec 1992 9:49

SATNC-ZSR (385-11e) 17 March 1993

MEMORANDUM FOR RECORD

SUBJECT: Shipment of M8A1 Chemical Agent Alarm

1. Reference M8A1 Chemical Agent Alarms, NSN 6665-01-105-5623, Lot No. 007, Serial #07267 and #02333.

2. The above referenced items which each contain 250 mCi Am-241 were "discovered" by a Natick Project Officer who did not want them nor knew exactly what to do, gave them to this office for proper disposition.

3. Initial contact with HQ AMCCOM Safety Office personnel and subsequent discussions with Mr. Cliff Gerich, Materiel Manager's Office, concluded that:

a. These items were probably preproduction prototypes, due to the unusual lot and serial number identification.

b. It was unknown whether these M8Als were manufactured IAW the item specification used for Type Classified M8Als.

c. Based upon the above the Material Manager's Office could not accept these M8Als for reissue and use.

4. As a result of these conversations it was determined that the Material Developer, U.S. Army Chemical Biological Defense Agency (CBDA), APG, would have radiation responsibility for these prototype M8Als. Subsequently Mr. Gerich and Mr. Daniel Liedtke, also from HQ AMCCOM, provided me with a POC, Ms. Lisa Foust, at CBDC, who agreed to accept these items.

SATNC-ZSR (385-11e)
SUBJECT: Shipment of M8A1 Chemical Agent Alarm

5. A review of Department of Transportation Regulations, Title 173, CFR, Subpart 1- Radioctive Material identified the following information:

a. The A_1 quantity (the maximum activity of special form I&A radioactive material permitted in a Type A package) for Am-241 is 8 Ci.

b. IAW Section 173.423 the Limited Quantity of radioactive material for an instrument and article special form is E-$2A_1$, therefore the Material Package Limit for a strong tight container would be:

$$10^{-2} \times 8 \text{ Ci} = 0.08 \text{ Ci or } 80 \text{ mCi}$$

c. Since each M8A1 contains 250 uCi of Am-241, this shipment would qualify as a exempt package-limited quantity of radioactive materials if the requirements of Sections 173.421, 173.421-1 and 172.604 are met.

6. As a result of the above a Request for Turn-in, DA Form 3161, (enclosure 1) was developed to obtain a Government Bill of Lading. This was forwarded through supply, transportation and warehousing, then the M8A1s were shipped on 11 March 1992.

John F. Sieckarski

Encl

John F. Sieckarski
Alternate Radiation Protection Ofcr

CF:
Paul G. Angelis, ISO

MBA

[illegible]

[illegible]

DaveFoster 584-4424

Brunswick Corp
1733 [illegible] Ave
Delnd, FL [illegible]
ATTN: Jeanne [illegible]

Sue Corneck

Ken Fab Mark Snoforski

Jeff [illegible] 793-[illegible]

George PANKOFF 584-2991 CRDEC

Jeanette Parmenter

904-738-1001

BCC-[illegible]

[illegible]

Sue Corneck

Mike [illegible]

[illegible] 966-3657

[illegible]

964

5662

[illegible]

MEMORANDUM OF CALL

Previous editions usable

TO: Paul

☑ YOU WERE CALLED BY— ☐ YOU WERE VISITED BY—

Cliff Jenkins

OF (Organization)

☑ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

793 - 5662

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE RE: - M4341 Detective

Wants you to call —

CRDEC

Bill Kline

584 - 5681

He wants them

RECEIVED BY	DATE	TIME
Hazel	2/19	11:15

63-110 NSN 7540-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
Prescribed by GSA

REQUEST FOR ISSUE OR TURN-IN

(DA PAM 710-2-1)

	ISSUE	SHEET NO.	N SHEETS
XX	TURN-IN	1	

3. REQUEST NO.

4. VOUCHER NO.

1. SEND TO: APO US ARMY NATICK RD&E CENTER
ATTN: SATNC-DLM NATICK, MA 01760

5. DATE MATERIEL REQUIRED

6. DODAAC

7. PRIORITY

8. ACCOUNTING/FUNDING DATA
3029058N70000 2217

2. REQUEST FROM: PAUL G. ANGELIS- SATNC-ZSR
INSTALLATION SAFETY OFFICE

9. END ITEM IDENT

9a. NAME/MANUFACTURER

9b. MODEL

9c. SERIAL NO.

*CODE ISSUE TURN-IN
I—Initial FWT—Fair Wear And Tear EX—Excess
R—Replacement RS—Report of Survey SC—Stmt of Charges

10. PUBLICATION

11. JOB ORDER NO.

12. ITEM NO. a	STOCK NO. b	ITEM DESCRIPTION c	UNIT OF ISSUE d	QUANTITY e	CODE* f	SUPPLY ACTION g	UNIT PRICE h	TOTAL COST i	j. POSTED DATE	BY
1	6665-01-105=5623	M8A1 Chemical Agent	each	1			2357.00	2357.00		
		Alarm, Lot No. 007, Serial #07267, containing 250 Ci Am-241 Special Form								
2	6665-01-105-5623	M8A1 Chemical Agent								
		Alarm, Lot No. 007, Serial #02333, containing 250 Ci AM-241 Special Form								
		Ship To:								
		U.S. Army Chemical Biological Defense Agency								
		ATTN: SCBRD-ENO-PM								
		Edgewood Arsenal, Bldg E3549								
		Aberdeen Proving Ground, Md 21010-5423								
	This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material									
	excepted package instruments or articles, UN 2910.									
	EMERGENCY CONTACT: 508-651-4758 John Sieckarski									
							SHEET TOTAL		GRAND TOTAL	

13. ISSUE/TURN-IN "QUANTITY" COLM IS REQUESTED	DATE	BY	14. ISSUE QTY IN "SUPPLY ACTION" COLUMN	DATE	BY	15. REC QTY IN "SUPPLY ACTION" COLUMN	DATE	BY
	23 Feb 1993	Samuel P. Blake, Sr. Property Officer /MH Perry/						

DA FORM 3161 MAY 83

REPLACES EDITION OF JUN 73 WHICH WILL BE USED UNTIL EXHAUSTED.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1983-407-261

21-JUN-89 SER:PETER

-) AM-241, M4EA1

(SMEAR #1-BC-C-02709; SMEAR #2-B-C-15E09

RIOD =	3.000	m	0.000	s	
ITION NUMBE =	1				
ACKGROUND	A B C	=	0.000	12.000	180.000
T COUNT	A B C	:	0.000	4000	0.000
ORRECTION	SELECTED				
ED BACKGROUND	A B C	=	0.100	2.50	144.350
M SCALING	A B C	=	1.660	0.000	10.270

****

ALPHA	BETA	GAMMA	
0.567	0.383	1.017 -	MEAN CPM
		0.067 -	TOTAL
0.941		10.441 -	DPM
0.000000	0.000000	0.000004	uC
0.423704	0.000000	4.703069	pC
0.00 -	1.17 -	2.98	MEAN CPM
		1.267	TOTAL
0.166 -		3.639	DPM
0.000000	0.000000	0.000013	uC
0.074771	0.00000	1320060	pC

SHIPPERS CERTIFICATION
(For Surface Shipment)

This consignment is within the limitations prescribed for surface shipment.

Number of Packages	49 CFR Paragraph	Proper Shipping Name	Net Quantity Per Package		
			Pieces	Weight	Volume
1 BX	173.421	RADIOACTIVE MATERIAL, LIMITED QUANTITIES, N.O.S. UN 2910	1	30	500 mCi
EMERGENCY	TELEPHONE NUMBER:	508-651-4758 JOHN SIECKARSKI			

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Name and address of shipper or his authorized agent: US ARMY NATICK RD&E CENTER
KANSAS STR., NATICK, MA 01760-5030

Signature: SANDRA J. FITCH, TRAFFIC MANAGER
508-651-4236

Date: 9 MARCH 1993

NATICK Form 1067
1 Jan 79

U.S. GOVERNMENT BILL OF LADING

MEMORANDUM COPY

B/L NO. ▶ D-1,983,844

1. TRANSPORTATION COMPANY TENDERED TO
ST JOHNSBURY TRUCKING COMPANY INC

2. SCAC
SJTC

3. DATE B/L PREPARED
930309

4. ROUTE ORDER/RELEASE NUMBER

5. DESTINATION (Name, address and ZIP code)
ABERDEEN PROVING GROUND-EDGEWOOD AREA
BLDG E3549
ABERDEEN PROVING GROUND, MD 21010-5423

6. SPLC (Dest.)
231592250

7. SPLC (Orig.)
141630250

8. ORIGIN (Name, address and ZIP code)
US ARMY NATICK RD&E CENTER
KANSAS STR., WHSE 20
NATICK, MA 01760-5030

9. CONSIGNEE (Name, address and ZIP code of installation)
ABERDEEN PROVING GROUND-EDGEWOOD AREA
BLDG E3549
ABERDEEN PROVING GROUND, MD 21010-5423

10. GBLOC (Cons.)
BAAM

11. SHIPPER (Name, address and ZIP code)
TRANSPORTATION OFFICER
US ARMY NATICK RD&E CENTER
KANSAS STR., NATICK, MA 01760-5030

12. APPROPRIATION CHARGEABLE CC: 3029058N700002217
21 3 2040 36T-6T06 P665896 2217 S19129

13. BILL CHARGES TO (Dept./agency, bureau/office mailing address and ZIP code)
TRANSPORTATION OPERATIONS
US ARMY FINANCE & ACCTING CTR
INDIANAPOLIS, IN 46249-0601

AGENCY LOC CODE

14. VIA (Route shipment when advantageous to the Government)

15. MARKS AND ANNOTATIONS (If extra services are ordered, see Administrative Directions No. 2 on reverse)
N/F: U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE AGENCY
BLDG E3549
ATTN: SCBRD-END-PM

16. PACKAGES NO.	KIND	17. HM	18. DESCRIPTION OF ARTICLES (Use carrier's classification or tariff description if possible; otherwise use a clear nontechnical description)	19. WEIGHT* (Pounds only)	FOR USE OF BILLING CARRIER ONLY: Services	Rate	Charges
			CLASSIFICATION ITEM NO. 43940				
1	BX		CHEMICALS, NOI, UN 2910 (N3A) CHEMICAL AGENT/RADIOACTIVE MATERIAL ALMARM, LOT NO. 007, SERIAL #07267/02333, CONTAINING 250mCi Am-241 SPECIAL FORM) *THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.421 FOR RADIOACTIVE MATERIAL EXCEPTED PACKAGE INSTRUMENTS OR ARTICLES, UN 2910* EMERGENCY TELEPHONE 508-651-4758	30			

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION, ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

SHIPPER'S SIGNATURE

TOTAL CHARGES

20. TARIFF/SPECIAL RATE AUTHORITY
SJTC000215 TENDER SUP 02

21. PICKUP SERV. FURNISHED ☐ YES
VEHICLE FULLY LOADED ☐ YES

SHIPPER'S INITIALS

22. CARRIER WAY/FREIGHT BILL NO. AND DATE

23. STOP THIS SHIPMENT AT

FOR:

24. FURNISH INFORMATION ON CAR/TRUCKLOAD/CONTAINER SHIPMENTS

INITIALS & NO.	SEAL NUMBERS	LENGTH/CUBE ORDERED	LENGTH/CUBE FURNISHED	MARKED CAPACITY ORDERED	MARKED CAPACITY FURNISHED	DATE FURNISHED
	APPLIED BY:					

25. CARRIER'S PICKUP DATE (Year, month, & day)
/ /

26a. SIGNATURE OF AGENT

26b. PER

B/L NUMBER
D-1,983,844

27. MODE	28. ESTIMATE	29. NO. OF CLS/TLS	30. TYPE RATE	31. PSC	32. REASON
AX	36				

Received by the transportation company named above, subject to conditions named on the reverse hereof, the property hereinafter described, in apparent good order and condition (contents and value unknown), to be forwarded to destination by the said company and connecting lines, there to be delivered in like good order and condition to said consignee.

FOR USE OF ISSUING OFFICE

33a. ISSUING OFFICE (Name and complete address)
US ARMY NATICK RD&E CENTER
KANSAS STR., WHSE 20
NATICK, MA 01760-5030

33b. GBLOC
AGAV

ISSUING OFFICER
SANDRA J. FITCH, TRAFFIC MANAGER 508-651-4236

34d. DELIVERED THIS CONSIGNMENT COMPLETE & IN APPARENT GOOD ORDER EXCEPT AS MAY BE INDICATED ☐ SHORTAGE ☐ DAMAGED

33d. CONTRACT/PURCHASE ORDER NO. OR OTHER AUTHORITY
AUTH ASD# M13607-3055-0101

33e. DATED

33f. FOB POINT NAMED IN CONTRACT

SATNC-ZSR (385-11e) 26 March 1993

MEMORANDUM FOR Mr. Kim Boriskin, Electronics & Calibration Branch, AMED

SUBJECT: Electron Tube Disposal

1. Reference U.S. Nuclear Regulatory Commission (NRC), Title 10, CFR, Part 30.15, Certain Items Containing Byproduct Material, enclosed.

2. In response to your telephone inquiry of 24 March 1993, I have reviewed Title 10, CFR, Part 30 - regulations promulgated by the NRC regarding general and material licenses for byproduct radioactive material, reference 1. This review has determined that the NRC exempts individuals from the requirements of Part 20, which includes disposal of radioactive material, for electron tubes. Provided the tube does not contain more than the isotopes specified in Part 30.15 a(8)(i) through (vi).

3. Should you have any questions, please contact Mr. John Sieckarski, ARPO, at 4758, or myself, X-5208.

Encl

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
Mr. John F. Sieckarski, ARPO, ISO (w/encl)

SATNC-ZSR 31 August 1994

MEMORANDUM FOR RECORD

SUBJECT: Prostaglandin E2/Interleukin-1 Alpha RIA Kits, Return Shipment

1. Reference telephone conversation with Ms. Sandra Fitch, LD and the undersigned on 31 August 1994.

2. In response to a request from Mr. Michael Blaha, USARIEM, and Mr. David Higgins, LD, I have reviewed the Department of Transportation regulations, Title 49 CFR, Section 173, Shippers - General Requirement for Shipments and Packages. A review of these regulations identified the following information.

a. The A2 quantity (the maximum activity of normal form radioactive material permitted in a Type A package) for I-125 is 70 Ci.

b. IAW Section 173.423 the activity limits- excepted quantities of radioactive materials for a liquid is E-4.A2, therefore, the Material package Limit for I-125 normal form in a strong tight container (cardboard box) would be:

10^{-4} .70Ci = 0.07 Ci or 70 uCi

3. Since these eight RIA kits contain approximately 2 uCi each to comply to the requirements of 173.421, 173.421-1, and 172.604, a Government Bill of Lading or local delivery package slip must contain the following declaration:

"This package conforms to the conditions and limitation specified in 49 CFR 173,421 for radioactive material, excepted package-limited quantity of material, UN 2910"

EMERGENCY CONTACT: 1-508-651-4758 - Mr. John Sieckarski

4. The above information was provided to Ms. Sandra Fitch, Transportation Office, reference 1, so as to return the RIA Kit received on Purchase Request W81NLC-4111-2004.

PAUL G. ANGELIS
Chief, Installation Safety Office

CF:
Ms. Sandra Fitch, Transportation Office (wo/encl)
Mr. John Sieckarski, ARPO, IOS (wo/encl)

MEMORANDUM OF CALL Previous editions usable

TO: Paul

[ ] YOU WERE CALLED BY— [ ] YOU WERE VISITED BY—

Sandy

OF (Organization) Transp.

[x] PLEASE PHONE ▶ [ ] FTS [ ] AUTOVON

4236

[ ] WILL CALL AGAIN [ ] IS WAITING TO SEE YOU

[ ] RETURNED YOUR CALL [ ] WISHES AN APPOINTMENT

MESSAGE

Do not call David H

Call her

RE: Radioactive Shipment

RECEIVED BY	DATE	TIME
Hazel	8/31	8:05

63-110 NSN 7540-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
Prescribed by GSA
GPO : 1990 O - 276-977 FPMR (41 CFR) 101—11.6

MEMORANDUM OF CALL Previous editions usable

TO: Paul

[ ] YOU WERE CALLED BY— [x] YOU WERE VISITED BY—

David Higgins

OF (Organization)

[x] PLEASE PHONE ▶ [ ] FTS [ ] AUTOVON

4033

[x] WILL CALL AGAIN [ ] IS WAITING TO SEE YOU

[ ] RETURNED YOUR CALL [ ] WISHES AN APPOINTMENT

MESSAGE

Left attached

RECEIVED BY	DATE	TIME
Hazel	8/31	7:45

63-110 NSN 7540-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
Prescribed by GSA
GPO : 1990 O - 276-977 FPMR (41 CFR) 101—11.6

PerSeptive Diagnostics

A Subsidiary of PerSeptive Biosystems, Inc.
735 CONCORD AVENUE
CAMBRIDGE, MA 02138
(617) 499-1433
Exempt #04-3207386

* * * * * * * * * *
*REMIT TO: *
* *
* P.O. BOX 3859 *
* *
BOSTON, MA 02241
* * * * * * * * * *

PAGE NO.	INVOICE NO.	APPLY TO	INVOICE DATE	CUST. NO.
1	20784		08/25/94	23260

INVOICE

WORK ORDER NO.	B.O.

SOLD TO
Defense Accounting Office
Kansas Street (508)651-4242
Attn: DFAS-IN/EM-AB
Natick, MA 01760-5010 USA

SHIP TO
US Army Natick RD & E Ctr
Warehouse # 20
Attn: SATNC-DSW (Kansas St.)
Natick, MA 01760-1500 USA

DATE SHIPPED	PURCHASE ORDER NO.	SHIP VIA	F.O.B.	TERMS
08/25/94	DHHK60-94-P3436	UPS GROUND	CAMBRIDGE	NET 30

BUYER	DATE REQUESTED	LOCATION	SALESPERSON	TERRITORY
K. Wilder	/ /	00735		DOMESTIC

ITEM NO.	DESCRIPTION	QUANTITY ORDERED	QUANTITY BACK ORD.	QUANTITY SHIPPED
[illegible]	1125-FLUE NM KIT (2.9 mCi)	4		4
[illegible]	1125-NUNN ILIa RIA KIT (2.9 mCi)	4		4
[illegible]	PACKAGING (0)	1		1
	New Customer Account			

ITEM KEY	SERIAL/LOT NO.		QUANTITY
[illegible]	400121	11/30/94	4
[illegible]	400184	11/30/94	4

THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49CFA 173,421 FOR EXCEPTED RADIOACTIVE MATERIAL, LIMITED QUANTITY, n.o.s. UN 2910

INTENDED FOR USE IN OR INCIDENT TO RESEARCH OR MEDICAL DIAGNOSIS OR TREATMENT

T-6541
8-26-94

SUB TOTAL
2975.00

SATNC-PS
~~STRNC-~~

29 AUG 94

MEMORANDUM FOR Chief, Storage & Services Branch, I-ESD

SUBJECT: Request for Shipping Document
Document No. W81NLC-4111-2004 Contract No. DAAK60-94-P-3436

1. Please prepare a document covering shipment at ~~government~~ contractors expense for the following items:

4 each RIA KITS, PROSTAGLANDIN E2, #8-6223
ACQ COST - $1390.00

4 each RIA KITS, INTERLEUKIN-1 ALPHA, #8-641
ACQ COST - $1580.00

NOTE: RADIOACTIVE MATERIAL

to the following address: Perseptive Diagnostics
735 Concord Ave.
Cambridge MA 02138

2. [X] A copy of the purchase order is enclosed.

[ ] A copy of the purchase request is enclosed. This is a credit card purchase.

3. Please furnish the undersigned a copy of the shipping document, showing the date and method of shipment.

Encl

Maureen Abbruzzese
Purchasing Agent/Ordering Officer

NATICK FL 378
1 MAY 92 EDITION OF 1 FEB 90 IS OBSOLETE.

(Contractor must submit four copies of invoice) | Expires Aug 31, 1992

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for re viewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing th collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwor Reduction Project(0704-0187), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your comple form to the procurement official identified in item 6.

1. CONTRACT/PURCH ORDER NO.	2. DELIVERY ORDER NO.	3. DATE OF ORDER.	4. REQUISITION/PURCH REQUEST NO.	5. PRIORITY
DAAK60-94-P-3436		08/18/94	W81NLC-4111-2004	

6. ISSUED BY — CODE B01
NATICK ACQUISITION CENTER
US ARMY NATICK RD&E CENTER
ATTN: SATNC-PS /B01
NATICK MA 01760-5011
MAUREEN ABBRUZZESE B01 (508) 651-4146

7. ADMINISTERED BY — CODE NOTE
NOTE TO VENDOR: DIRECT ANY INQUIRIES TO THE PURCHASING AGENT/CONTRACT SPECIALIST INDICATED IN BLOCK #6.

8. DELIVERY FOB
[X] DEST
[ ] OTHER
(See Schedule)

9. CONTRACTOR Vendor Id: 00003677 CODE — FACILITY CODE
NAME AND ADDRESS
PERSEPTIVE DIAGNOSTICS
735 CONCORD AVENUE
CAMBRIDGE MA 02138

10. DELIVER TO FOB POINT BY 09/01/94

11. MARK IF BUS.
[X] SMALL
[ ] SMALL DISA VANTAGED
[ ] WOMEN-OWNE

12. DISCOUNT TERMS 0% 00 Days Net 030

13. MAIL INVOICES TO See Block 15

14. SHIP TO — CODE W13G07
US ARMY NATICK RD&E CTR WHSE20
ATTN: SATNC-DSW (KANSAS ST)
NATICK MA 01760-5027 DAAK6094P3436
(DELIVERY HOURS 0800-1500)

15. PAYMENT WILL BE MADE BY — CODE HQ0190
DEFENSE ACCOUNTING OFFICE
KANSAS STREET (508) 651-4242
ATTN: DFAS-IN/EM-AB
NATICK MA 01760-5010

MARK ALL PACKAGE AND PAPERS WITH CONTRACT OR ORDER NUMBER

16. DELIVERY — This delivery order is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.

PURCHASE X Reference your ORAL-JOHN SIEGAL 8/18/94 furnish the following on terms specified herein

ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

NAME OF CONTRACTOR | SIGNATURE | TYPED NAME AND TITLE | DATE SIGNED

[ ] If this box is marked, supplier must sign Acceptance and return the following number of copies:

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
SEE PAGE TWO

Award Oblig Amt US$ 2,960.0

18. ITEM NO.	19. SCHEDULE OF SUPPLIES/SERVICE	20. QUANTITY ORDERED/ACCEPTED*	21. UNIT	22. UNIT PRICE	23. AMOUNT
	THE ATTACHED CLAUSES, PAGES 1-4, DATED 23 AUG 1993, ARE INCORPORATED INTO THIS PURCHASE ORDER AS THEY APPLY. NOTE TO VENDOR: PLEASE DO NOT SHIP UNTIL NOTIFIED BY GOVERNMENT PERSONNEL-VENDOR WILL BE NOTIFED PRIOR TO 30 SEP 1994				

*If quantity accepted by the Government is same as quantity ordered, indicate by x. If different, enter actual quantity accepted below quantity ordered and encircle.

24. UNITED STATES OF AMERICA
BY: X 000 Kathleen Wilder
CONTRACTING/ORDERING OFFICER

25. TOTAL $ 2960.0

29. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN
[ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

DATE | SIGNATURE OF AUTHORIZED GOVERNMENT REP.

.I certify this account is correct and proper for payment

DATE | SIGNATURE AND TITLE OF CERTIFYING OFFICER

27. SHIP. NO.
[ ] PARTIAL
[ ] FINAL

28. D.O. VOUCHER NO.

30. INITIALS

31. PAYMENT
[ ] COMPLETE
[ ] PARTIAL
[ ] FINAL

32. PAID BY

33. AMT VERIFIED CORRECT FO

34. CHECK NUMBER

35. BILL OF LADING NO.

37. REC'D AT	38. RECEIVED BY	39. DATE REC'D	40. TOTAL CONT.	41. S/R ACCOUNT NUMBER	42. S/R VOUCHER NO.

PERSEPTIVE DIAGNOSTICS

ITEM NO.	SCHEDULE OF SUPPLIES/SERVICE	QUANTITY	U/I	UNIT PRICE	AMOUNT
(continued)	PLEASE REFERENCE "DAAK60-94-P-3436" ON ALL INVOICES, PACKING SLIPS AND PACKAGES PERTAINING TO THIS ORDER				
0001	RIA KIT, PROSTAGLANDIN E2, (PGE2), {125 I}, 100 TESTS/KIT, #8-6223	4.00	EA	345.000000	1380.00
0002	RIA KIT, INTERLUEKIN-1 ALPHA, {125 I}, 100 TESTS/KIT, #8-6411	4.00	EA	395.000000	1580.00

REMIT PER INVOICE

ACCOUNTING CLASSIFICATION

2142040 475-8103 P611101 S19129 CC: 4450192AA4A0026EB $1776.00

2142040 475-8103 P623002 S19129 CC: 4450189LA4A0026EB $1184.00

RADIOACTIVE MATERIAL
APPROVED FOR PURCHASE UNDER
BML 20-315-2
RPO REF. NO. A-48-U

NOTE TO VENDOR: PLEASE LABEL OUTSIDE OF ALL PACKAGES "RADIOACTIVE MATERIAL"

52.223-7 NOTICE OF RADIOACTIVE MATERIALS (NOV 1991)

(a) The Contractor shall notify the Contracting Officer or designee, in writing, FIVE (5) days prior to the delivery of, or prior to completion of any servicing required by this contract of, items containing either (1) radioactive material requiring specific licensing under the regulations issued pursuant to the Atomic Energy Act of 1954, as amended, as set forth in Title 10 of the Code of Federal Regulations, in effect on the date of this contract, or (2) other radioactive material not requiring specific licensing in which the specific activity is greater than 0.002 microcuries per gram or the activity per item equals or

PERSEPTIVE DIAGNOSTICS

exceeds 0.01 microcuries. Such notice shall specify the part or parts of the items which contain radioactive materials, a description of the materials, the name and activity of the isotope, the manufacturer of the materials, and any other information known to the Contractor which will put users of the items on notice as to the hazards involved (OMB No. 9000-0107).

(b) If there has been no change affecting the quantity of activity, or the characteristics and composition of the radioactive material from deliveries under this contract or prior contracts, the Contractor may request that the Contracting Officer or designee waive the notice requirement in paragraph (a) of this clause. Any such request shall--

(1) Be submitted in writing;

(2) Contain a certification that the quantity of activity, characteristics, and composition of the radioactive material have not changed; and

(3) Cite the contract number on which the prior notification was submitted and the contracting office to which it was submitted.

(c) All items, parts, or subassemblies which contain radioactive materials in which the specific activity is greater than 0.002 microcuries per gram or activity per item equals or exceeds 0.01 microcuries, and all containers in which such items, parts or subassemblies are delivered to the Government shall be clearly marked and labeled as required by the latest revision of MIL-STD 129 in effect on the date of the contract.

(d) This clause, including this paragraph (d), shall be inserted in all subcontracts for radioactive materials meeting the criteria in paragraph (a) of this clause.

(End of clause)

F.O.B. POINT

F.O.B. Point: CAMBRIDGE, MA

Note to Vendor: Ship prepaid, best way and cheapest way. Show cost of prepaid UPS, parcel post or freight charges as a separate line item on invoice. For prepaid freight charges of $100.00 or more, submit ORIGINAL paid copy of the freight bill with the invoice.

(end of clause)

RI FROM	M&S	STOCK NUMBER FSC	NIIN	ADD	UNIT OF ISSUE	QUANTITY	DOCUMENT NUMBER SERV	REQUISITIONER	DATE	SERIAL	SUFFIX	SUPPLEMENTARY ADDRESS SERV	SIGNAL	FUND	DISTRIBUTION	PROJECT	PRIORITY	REQ'D DEL DATE	ADVICE	RI	UNIT PRICE DOLLARS	CTS.
						4		[illegible]	4243	A003											6.00	

FROM	SHIP TO	MARK FOR	PROJECT	TOTAL PRICE DOLLARS	CTS.
Army Natick RD&E Center [illegible] DIV., LOGISTICS [illegible] SATNC-LSC [illegible] St., Natick, MA 01760	Perseptive Diagnostics 735 Concord Ave Cambridge, MA 02138 B ATTN:	C	D	1,390.00 E	

SE LOCATION	TYPE OF CARGO	UNIT PACK	UNIT WEIGHT	UNIT CUBE	UFC	NMFC	FREIGHT RATE		DOCUMENT DATE	MAT COND	QUANTITY		
	G	H	I	J	K	L	M	N	O	P	Q	R	S 2

TE DATA (ITEM ORIGINALLY REQUESTED)	FREIGHT CLASSIFICATION NOMENCLATURE	
	U	N/R: WRINCC-[illegible]-2004
	ITEM NOMENCLATURE X	Prostaglandin E. 88-6223 Y

LECTED BY AND DATE	TYPE OF CONTAINER(S)	TOTAL WEIGHT	RECEIVERS USE	RECEIVED BY AND DATE	INSPECTED BY AND DATE
	2 BX	3 20		7 18x16x20	8

CKED BY AND DATE	NO. OF CONTAINER(S)	TOTAL CUBE	WAREHOUSED BY AND DATE	WAREHOUSE LOCATION
Higgins / /	5 1	6 3.33	9	10

AC	BB	CC	DD	EE

STINATION ADDRESS	DATE SHIPPED		
	12 8-31-94	FF [signature]	GG

SPORTATION CHARGEABLE TO	14 B/LADING, AWB, OR RECEIVER'S SIGNATURE (AND DATE)	15 RECEIVER'S DOCUMENT NUMBER
	DRIVEN BY MOTOR POOL 8/31/94	

3

rm 1348-1, SEP 87 *Jun 86 edition may be used.* FORM APPROVED. OMB NO. 0704-0188 **DOD SINGLE LINE ITEM RELEASE/RECEIPT DOCUMENT**

SHIPPERS CERTIFICATION
(For Surface Shipment)

This consignment is within the limitations prescribed for surface shipment.

Number of Packages	49 CFR Paragraph	Proper Shipping Name	Net Quantity Per Package		
			Pieces	Weight	Volume
1 BX	173.421	RADIOACTIVE MATERIAL, LIMITED QUANTITIES, N.O.S. UN 2910 THIS PACKAGE CONFORMS TO THE CONDITIONS & LIMITATION SPECIFIED IN 49CFR 173.421 FOR EXCEPTED PACKAGE LIMITED QTY, RADIOACTIVE MATERIAL, N.O.S., UN 2910	1	20	16 mCi

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Name and address of shipper or his authorized agent: US ARMY NATICK RD&E CENTER
KANSAS STR., NATICK, MA 01760

Signature: Sandra J. Fitch

SANDRA J. FITCH, TRAFFIC MANAGER
508-651-4236 31 AUGUST 1994

Date 8-31-94

NATICK Form 1067
1 Jan 79

NATICK-PO
STRNC-

29 AUG 94

MEMORANDUM FOR Chief, Storage & Services Branch, I-ESD

SUBJECT: Request for Shipping Document
Document No. [illegible] Contract No. DAAK60-94-P-3436

1. Please prepare a document covering shipment at contractors government expense for the following items:

4 each RIA KITS, PROSTAGLANDIN E2, #8-6223
16. mCi ACQ COST - $1390.00

4 each RIA KITS, INTERLEUKIN-1 ALPHA, #8-6411
ACQ COST - $1580.00

NOTE: RADIOACTIVE MATERIAL

to the following address: Perseptive Diagnostics
735 Concord Ave.
Cambridge MA 02138

2. [X] A copy of the purchase order is enclosed.

[ ] A copy of the purchase request is enclosed. This is a credit card purchase.

3. Please furnish the undersigned a copy of the shipping document, showing the date and method of shipment.

Encl

[signature]
Purchasing Agent/Ordering Officer

NATICK FL 378
1 MAY 92 EDITION OF 1 FEB 90 IS OBSOLETE.

SATNC-ZSR (385-11e) 17 March 1993

MEMORANDUM FOR RECORD

SUBJECT: Shipment of M8A1 Chemical Agent Alarm

1. Reference M8A1 Chemical Agent Alarms, NSN 6665-01-105-5623, Lot No. 007, Serial #07267 and #02333.

2. The above referenced items which each contain 250 mCi Am-241 were "discovered" by a Natick Project Officer who did not want them nor knew exactly what to do, gave them to this office for proper disposition.

3. Initial contact with HQ AMCCOM Safety Office personnel and subsequent discussions with Mr. Cliff Gerich, Materiel Manager's Office, concluded that:

a. These items were probably preproduction prototypes, due to the unusual lot and serial number identification.

b. It was unknown whether these M8A1s were manufactured IAW the item specification used for Type Classified M8A1s.

c. Based upon the above the Material Manager's Office could not accept these M8A1s for reissue and use.

4. As a result of these conversations it was determined that the Material Developer, U.S. Army Chemical Biological Defense Agency (CBDA), APG, would have radiation responsibility for these prototype M8A1s. Subsequently Mr. Gerich and Mr. Daniel Liedtke, also from HQ AMCCOM, provided me with a POC, Ms. Lisa Foust, at CBDC, who agreed to accept these items.

SATNC-ZSR (385-11e)
SUBJECT: Shipment of M8A1 Chemical Agent Alarm

5. A review of Department of Transportation Regulations, Title 173, CFR, Subpart 1- Radioctive Material identified the following information:

a. The A_1 quantity (the maximum activity of special form I&A radioactive material permitted in a Type A package) for Am-241 is 8 Ci.

b. IAW Section 173.423 the Limited Quantity of radioactive material for an instrument and article special form is $E\text{-}2A_1$, therefore the Material Package Limit for a strong tight container would be:

$$10^{-2} \times 8 \text{ Ci} = 0.08 \text{ Ci or } 80 \text{ mCi}$$

c. Since each M8A1 contains 250 uCi of Am-241, this shipment would qualify as a exempt package-limited quantity of radioactive materials if the requirements of Sections 173.421, 173.421-1 and 172.604 are met.

6. As a result of the above a Request for Turn-in, DA Form 3161, (enclosure 1) was developed to obtain a Government Bill of Lading. This was forwarded through supply, transportation and warehousing, then the M8A1s were shipped on 11 March 1992.

John F. Sieckarski

Encl

John F. Sieckarski
Alternate Radiation Protection Ofcr

CF:
Paul G. Angelis, ISO

MBA 1

[illegible]

[illegible]

DaveFoster 584-4424

Brunswick Corp
1735 [illegible] Ave
Deland, FL [illegible]
ATTN: Jeanne [illegible]

Sue Corneck

Ken Fab Mark Suofoski

Jeff Havenner 793-[illegible]
George PAMKOFF 584-2991 CRDEC
Jeanne Parmenter

904-738-1001

BCC-[illegible]

[illegible]

Sue Corneck

Mike [illegible]
[illegible] 966-3652

enz
764

5662

Lisa Foster CR

MEMORANDUM OF CALL

Previous editions usable

TO: Paul

☑ YOU WERE CALLED BY— ☐ YOU WERE VISITED BY—

Cliff Gerich

OF (Organization)

☑ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

493 - 5662

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE REi - M43A1 Detectors

Wants you to call —

CRDEC

Bill Kline

584 - 5681

He wants them

RECEIVED BY	DATE	TIME
Hazel	2/19	11:15

63-110 NSN 7540-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
Prescribed by GSA

REQUEST FOR ISSUE OR TURN-IN
(DA PAM 710-2-1)

	ISSUE	SHEET NO.	N SHEETS
XX	TURN-IN	1	

3. REQUEST NO.

4. VOUCHER NO.

1. SEND TO: APO US ARMY NATICK RD&E CENTER
ATTN: SATNC-DLM NATICK, MA 01760

5. DATE MATERIEL REQUIRED

6. DODAAC

7. PRIORITY

8. ACCOUNTING/FUNDING DATA
3029058N70000 2217

2. REQUEST FROM: PAUL G. ANGELIS- SATNC-ZSR
INSTALLATION SAFETY OFFICE

9. END ITEM IDENT

9a. NAME/MANUFACTURER

9b. MODEL

9c. SERIAL NO.

*CODE ISSUE TURN-IN
I—Initial FWT—Fair Wear And Tear EX—Excess
R—Replacement RS—Report of Survey SC—Stmt of Charges

10. PUBLICATION

11. JOB ORDER NO.

12. ITEM NO. a	STOCK NO. b	ITEM DESCRIPTION c	UNIT OF ISSUE d	QUANTITY e	CODE* f	SUPPLY ACTION g	UNIT PRICE h	TOTAL COST i	j. POSTED DATE	BY
1	6665-01-105=5623	M8A1 Chemical Agent	each	1			2357.00	2357.00		
		Alarm, Lot No. 007, Serial #07267, containing 250 μCi Am-241 Special Form								
2	6665-01-105-5623	M8A1 Chemical Agent								
		Alarm, Lot No. 007, Serial #02333, containing 250 μCi AM-241 Special Form								
		Ship To:								
		U.S. Army Chemical Biological Defense Agency								
		ATTN: SCBRD-ENO-PM								
		Edgewood Arsenal, Bldg E3549								
		Aberdeen Proving Ground, Md 21010-5423								
	This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material									
	excepted package instruments or articles, UN 2910.									
	EMERGENCY CONTACT: 508-651-4758 John Sieckarski									
							SHEET TOTAL		GRAND TOTAL	

13. ISSUE/TURN-IN "QUANTITY" COLM IS REQUESTED	DATE	BY	14. ISSUE QTY IN "SUPPLY ACTION" COLUMN	DATE	BY	15. REC QTY IN "SUPPLY ACTION" COLUMN	DATE	BY
	23 Feb 1993	Samuel P. Blake, Sr. Property Officer /MH Perry/						

DA FORM 3161 MAY 83

REPLACES EDITION OF JUN 73 WHICH WILL BE USED UNTIL EXHAUSTED.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1983-407-261

21-JUN-89 SER:PETER

-> AM-241, M4BA1

SMEAR #1-BC-C-02709; SMEAR #2-B-C-15E09

RIOD =	3.000 m	0.000 s		
ITION NUMBE =	1			
ACKGROUND	A B C =	0.000	12.000	180.000
T COUNT	A B C :	0.000	4000	0.000
ORRECTION	SELECTED			
ED BACKGROUND	A B C =	0.100	2.50	144.350
M SCALING	A B C =	1.660	0.000	10.270

****

ALPHA	BETA	GAMMA	
0.567	0.323	1.017 -	MEAN CPM
		0.067 -	TOTAL
0.941		10.441 -	DPM
0.000000	0.000000	0.000004	uC
0.423704	0.000000	4.703069	pC
0.00 -	1.17 -	2.98	MEAN CPM
		1.267	TOTAL
0.166 -		3.639	DPM
0.000000	0.000000	0.000013	uC
0.074771	0.00000	1320060	pC

SHIPPERS CERTIFICATION
(For Surface Shipment)

This consignment is within the limitations prescribed for surface shipment.

Number of Packages	49 CFR Paragraph	Proper Shipping Name	Net Quantity Per Package		
			Pieces	Weight	Volume
1 BX	173.421	RADIOACTIVE MATERIAL, LIMITED QUANTITIES, N.O.S. UN 2910	1	30	500 mCi
EMERGENCY	TELEPHONE NUMBER:	508-651-4758 JOHN SIECKARSKI			

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Name and address of shipper or his authorized agent: US ARMY NATICK RD&E CENTER
KANSAS STR., NATICK, MA 01760-5030

Signature: SANDRA J. FITCH, TRAFFIC MANAGER
508-651-4236

Date: 9 MARCH 1993

NATICK Form 1067
1 Jan 79

U.S. GOVERNMENT BILL OF LADING

MEMORANDUM COPY

B/L NO. ▶ D-1,983,844

1. TRANSPORTATION COMPANY TENDERED TO
ST JOHNSBURY TRUCKING COMPANY INC

2. SCAC
SJTC

3. DATE B/L PREPARED
930309

4. ROUTE ORDER/RELEASE NUMBER

5. DESTINATION (Name, address and ZIP code)
ABERDEEN PROVING GROUND-EDGEWOOD AREA
BLDG E3549
ABERDEEN PROVING GROUND, MD 21010-5423

6. SPLC (Dest.)
231592250

7. SPLC (Orig.)
141630250

8. ORIGIN (Name, address and ZIP code)
US ARMY NATICK RD&E CENTER
KANSAS STR., WHSE 20
NATICK, MA 01760-5030

9. CONSIGNEE (Name, address and ZIP code of installation)
ABERDEEN PROVING GROUND-EDGEWOOD AREA
BLDG E3549
ABERDEEN PROVING GROUND, MD 21010-5423

10. GBLOC (Cons.)
BAAM

11. SHIPPER (Name, address and ZIP code)
TRANSPORTATION OFFICER
US ARMY NATICK RD&E CENTER
KANSAS STR., NATICK, MA 01760-5030

12. APPROPRIATION CHARGEABLE CC: 3029058H700002217
21 3 2040 36T-6T06 P665896 2217 S19129

13. BILL CHARGES TO (Dept./agency, bureau/office mailing address and ZIP code)
TRANSPORTATION OPERATIONS
US ARMY FINANCE & ACCTING CTR
INDIANAPOLIS, IN 46249-0601

AGENCY LOC CODE

14. VIA (Route shipment when advantageous to the Government)

15. MARKS AND ANNOTATIONS (If extra services are ordered, see Administrative Directions No. 2 on reverse)
M/F: U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE AGENCY
BLDG E3549
ATTN: SCBRD-ENO-PM

16. PACKAGES NO.	KIND	17. HM	18. DESCRIPTION OF ARTICLES (Use carrier's classification or tariff description if possible; otherwise use a clear nontechnical description)	19. WEIGHT* (Pounds only)	FOR USE OF BILLING CARRIER ONLY Services	Rate	Charges
			CLASSIFICATION ITEM NO. 43940				
1	BX		CHEMICALS, NOI, UN 2910 (N3A1 CHEMICAL AGENT/RADIOACTIVE MATERIAL ALKARN, LOT NO. 007, SERIAL #07267/02333, CONTAINING 250mCi Am-241 SPECIAL FORM) *THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.421 FOR RADIOACTIVE MATERIAL EXCEPTED PACKAGE INSTRUMENTS OR ARTICLES, UN 2910* EMERGENCY TELEPHONE 508-651-4758	30			

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION, ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

SHIPPER'S SIGNATURE

TOTAL CHARGES

20. TARIFF/SPECIAL RATE AUTHORITY
SJTC000215 TENDER SUP 02

21. PICKUP SERV. FURNISHED ☐ YES
VEHICLE FULLY LOADED ☐ YES

SHIPPER'S INITIALS

22. CARRIER WAY/FREIGHT BILL NO. AND DATE

23. STOP THIS SHIPMENT AT

FOR:

24. FURNISH INFORMATION ON CAR/TRUCKLOAD/CONTAINER SHIPMENTS

INITIALS & NO.	SEAL NUMBERS	LENGTH/CUBE ORDERED	LENGTH/CUBE FURNISHED	MARKED CAPACITY ORDERED	MARKED CAPACITY FURNISHED	DATE FURNISHED
	APPLIED BY:					

25. CARRIER'S PICKUP DATE (Year, month, & day)
/ /

26a. SIGNATURE OF AGENT

26b. PER

B/L NUMBER
D-1,983,844

27. MODE	28. ESTIMATE	29. NO. OF CLS/TLS	30. TYPE RATE	31. PSC	32. REASON
AX	36				

Received by the transportation company named above, subject to conditions named on the reverse hereof, the property hereinafter described, in apparent good order and condition (contents and value unknown), to be forwarded to destination by the said company and connecting lines, there to be delivered in like good order and condition to said consignee.

FOR USE OF ISSUING OFFICE

33a. ISSUING OFFICE (Name and complete address)
US ARMY NATICK RD&E CENTER
KANSAS STR., WHSE 20
NATICK, MA 01760-5030

33b. GBLOC
AGAV

ISSUING OFFICER
SANDRA J. FITCH, TRAFFIC MANAGER 508-651-4236

34d. DELIVERED THIS CONSIGNMENT COMPLETE & IN APPARENT GOOD ORDER EXCEPT AS MAY BE INDICATED ☐ SHORTAGE ☐ DAMAGED

33d. CONTRACT/PURCHASE ORDER NO. OR OTHER AUTHORITY AUTH ASD# W13G07-3055-0101

33e. DATED

33f. FOB POINT NAMED IN CONTRACT

SATNC-ZSN (385-11e) 27 March 1995

MEMORANDUM FOR Dr. Stephen Muza, USARIEM

SUBJECT; aANP Atrial Natriuretic RIA, I-125

1. Reference discussion with Ms. Sandra Fitch, Mr. John Sieckarski and the undersigned on 27 March 1995, subject: SAB.

2. In response to your request Mr. John Sieckarski and I have reviewed the Department of Transportation regulation, Title 49, CFR, Section 173, Shippers-General Requirements for shipments and Packages. This review concerns a shipment of 6 RIA kits from Peninsula Laboratories, Inc. to be returned.

3. Our review of this regulation identified the following:

a. The A2 quantity (the maximum activity of normal form radioactive material permitted in a Type A Package) for I-125 is 70 Ci.

b. IAW Section 173.423 the activity limits-excepted quantities of radioactive material for a solid is E-3 x A2, therefor, the material package limit for I-125 normal form in a strong tight container (cardboard box) would be 7mCi.

4. Since these six RIA kits contain approximately 9.0 uCi total activity to comply with the requirements of DOT regulations 173.421, 173.421-1, and 172,604 a Government Bill of Lading must contain the following declaration:

"This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package-limited quantity of material, UN2910"

"EMERGENCY CONTACT: Mr. John Sieckarski (508) 651-4758
(617) 284-8860

5. Should you have any questions please contact me at X5208.

PAUL G. ANGELIS
Radiation Protection Officer

CF:
Ms. Sandra Fitch, Transportation Office
Mr. John Sieckarski, Alternate Radiation Protection Officer

PACKING LIST

PAGE 1
INVOICE NO. A635

PENINSULA LABORATORIES, INC.
611 TAYLOR WAY, BELMONT, CALIFORNIA 94002 U.S.A.
(415) 592-5392 FAX (415) 595-4071

CUSTOMER # US1847

BILL TO
DEFENSE ACCOUNTING OFFICE
KANSAS STREET
ATTN: DFAS-IN/EM-AB
NATICK MA 017605010

03/23/95
ACCT6. PROP. OFFICER WHSE. #20
ATTN: DFAS-IN/EM-AB
ATTN: SATNC-DSW (KANSAS ST)
U.S. ARMY NATICK ROAD & E CTR.

NATICK, MA 01760-5027

A23165 (3) 1333

DAAK60-95-P-

OUR REFERENCE NO: A23165 TERMS: NET 30 DAYS

ITEM NO.	DESCRIPTION/LOT #	QUANTITY ORDERED	QUANTITY SHIPPED	QUANTITY BACK ORDERED	UNIT PRICE	EXTENDED PRICE
~~RIK --8798~~	~~ANP ATRIAL NATRIURETIC 1-28~~	~~6~~	~~6~~	0.0	[redacted]	[redacted]
	950132					
	PACKAGING	1	1	0.0		

T3325
1-
3/25/95

9.0 pl

3/25/95

THANK FOR YOUR ORDER.
INVOICES ARE DUE IN US DOLLARS.

SALE AMOUNT

HANDLING
SALES TAX

SHIP DATE: 31MAR95
ACC# 102167244

US ARMY NATICK
KANSAS ST.
NATICK MA 01760
(508)651-4236

ACTUAL WGT: 18 LBS MAN-WT
DIM WEIGHT CHECKED
(000)000-0000

TO: DEIDRE ARNERICH
PENINSULA LABORATORIES INC
611 TAYLOR WAY
RETURN AUTH #23165-133
BELMONT CA 94002

306 1921 545

BILL RECIPIENT

306 1921 545

REF:

PRIORITY OVERNIGHT MON

CAD# 37087 31MAR95
TRK# 306 1921 545

SFO

94002-CA-US W7 SQL

STOCK NUMBER	QUANTITY	DOCUMENT NUMBER	SUPPLEMENTARY ADDRESS	DISTRIBUTION	PROJECT	REQ'D DELIVERY DATE	UNIT PRICE
	0	[illegible]					0.00

SHIPPED FROM: Army [illegible] R&D Center
[illegible] Div., [illegible]
ATTN: [illegible]
[illegible], Maine, MA 0[illegible]

SHIP TO: [illegible]
[illegible] Taylor Way
[illegible], CA [illegible]
ATTN: [illegible]

MARK FOR | PROJECT | TOTAL PRICE DOLLARS CTS 0.00

WAREHOUSE LOCATION | TYPE OF CARGO | UNIT PACK | UNIT WEIGHT | UNIT CUBE | DEC | NMFC | FREIGHT RATE | DOCUMENT DATE | MAT COND | QUANTITY

SUBSTITUTE DATA (ITEM ORIGINALLY REQUESTED) | FREIGHT CLASSIFICATION NOMENCLATURE | C/R

ITEM NOMENCLATURE: [illegible] Kit, Case RIX 8798

SELECTED BY AND DATE	TYPE OF CONTAINER(S)	TOTAL WEIGHT	RECEIVED BY AND DATE	INSPECTED BY AND DATE
	BX	10		
PACKED BY AND DATE	**NO. OF CONTAINER(S)**	**TOTAL CUBE**	**WAREHOUSED BY AND DATE**	**WAREHOUSE LOCATION**
[illegible] 03/30/95	1	~~0.00~~ 34		

REMARKS: [illegible]

FIRST DESTINATION ADDRESS: Return Auto #23[illegible]-133

DATE SHIPPED

13 TRANSPORTATION CHARGEABLE TO

14 BILLING, AWB, OR RECEIVER'S SIGNATURE (AND DATE)
AIRBILL 3061921545 DTD 31 MAR 95
VIA: FEDERAL EXPRESS

15 RECEIVER'S DOCUMENT NUMBER

DD FORM 1348-1A, SEP 87 (BLUE) Jun 86 edition may be used. FORM APPROVED. OMB NO. 0704-0188 DOD SINGLE LINE ITEM RELEASE/RECEIPT DOCUME

SATNC-ZSN (385-11e) 29 March 1995

MEMORANDUM FOR RECORD

SUBJECT: Removal of Radioactive Source from Excess Equipment

1. A TM Analytic model #5303, serial #38701, possessed by the U.S. Army Research Institute of Environmental Medicine (USARIEM) had been determined as excess equipment for turn-in and disposal. Prior to this, on 23 September 1994, the Ba-133 radioactive standard was removed by a TM Analytic field service representative, enclosure 1.

2. Removal of this source for return to the manufacture for disposal allows the equipment to be processed for disposal without further radiation concerns.

PAUL G. ANGELIS
Radiation Protection Officer

CF:
Dr. Michael Durkot, USARIEM w/o encl
CPT Marr, USARIEM
Mr. John F. Sieckarski, ARPO, ESO

SERVICE REPORT

TM 160138

TmAnalytic
574 Supreme Drive
Bensenville, IL 60106
(708) 860-9122 • 1-800-323-6617

SERVICE ENGINEER	DISPATCH	ARRIVAL	DEPARTURE	TOTAL SITE HRS.
B Longfield	:	:	:	.

MODEL NO.	SERIAL NO.	DATE	WT	RT TIME
5303	38701	9/23/94		

CUSTOMER NO.	CONTRACT NO.
	AC1(123)Z049/12

EC	PM	MOD	OTHER
			X

INS	WAR	CON	X-C	BILL
		X		

TERRITORY	WORK ORDER NUMBER	SERVICE AUTHORIZATION
220		

SERVICE MANAGER / DATE

CUSTOMER ACCEPTANCE / DATE 23/9/94

SERVICE ADDRESS

INSTITUTION U.S. Army Natick Labs
USER/DEPT. Dr Durbin / ARIEM BH (42)
STREET Kansas St
CITY/STATE Natick MA ZIP

BILLING ADDRESS (If Not Exactly The Same)

TELEPHONE NUMBER

DESCRIPTION	PART NUMBER	HOURS/ QUANTITY	RATE/ PRICE	EXTENDED AMOUNT	DEFECT CODE
	–				
	–				
	–				
	–				
	–				
	–				
	–				
	–				
	–				
LABOR ONLY (No. Parts Used)					

TOTAL MATERIAL				
SHIPPING				
ZONE CHARGE				
TRAVEL OVER 4 HOURS				
LABOR OVER 1 HOUR				
TOTAL				

ZONE 1 (2) 3 4

ZONE 4 ONLY–

LABOR

DEFECT / ACTION

Customer requested Ba 133 (external standard) source be removed from instrument before System is turned in for scrap.

Removed 9ue Ba 133 source from instrument to be sent to manufacturer for disposal

Form No. 2200-Rev. 9/93

CUSTOMER COPY

AMSSC-S-ENS (385-11e) 6 September 1995

MEMORANDUM FOR Ms. Jennifer Denommee, Transportation Office, LD

SUBJECT: Records Of Radioactive Material Shipment

1. Reference our conversation of Thursday, 31 August 1995, subject: SAB.

2. The U.S. Nuclear Regulatory Commission (NRC) recently conducted an unannounced inspection of this Commands Radiation Protection Program. This inspection also included a review of various documents and records regarding the program.

3. Although the NRC inspector did not review records of radioactive material transfer we did discuss recent returns to vendors. This discussion identified the necessity to actually possess a Government Bill of Lading or other form of shipping paper for each transfer. To this end I have reviewed all shipments and transfers and have identified three shipments returned to vendor for which this record is not readily available.

4. Photocopies of receipt packing slips and return shipping instructions which I had provided to Ms. Sandra Fitch are attached. Please review your records for the shipping papers associated to the return and provide me with a photocopy for my record and use in future inspections. Should you have any questions I may be reached at X-5208.

PAUL G. ANGELIS
Radiation Protection Officer

CF: Mr. John F. Sieckarski, ARPO, ESO

AMSSC-S-ENS (385-11d) 5 September 1996

MEMORANDUM FOR Dr. Michael Durkot, U.S. Army Research Institute of Environmental Medicine (USARIEM)

SUBJECT: Laboratory Counting Equipment Swipe Test Results

1. Responding to your request I have obtained and analyzed swipe samples to determine the existence of residual radioactive surface contamination on the Beckman 5500 Gamma Counter and Packard 500 Series Gamma Counter.

2. Analysis results, enclosed, indicate no residual removable radioactive surface contamination. This equipment, upon removal of the check sources, is suitable for excess or transfer. The check sources may be used with other USARIEM radiation counting equipment or transferred to the undersigned for disposal.

3. Should you have any questions I may be reached at extension 4758.

Encl

JOHN F. SIECKARSKI
Alternate Radiation Protection Officer

CF:
Paul G. Angelis, Radiation Protection Officer

DATE	WIPE #	LOCATION	AREA (cm^2)	COUNTED FOR	TIME MIN.	GROSS COUNTS	cpm	BKGD	NET cpm	DPM 100 cm^2	$\mu c/cm^2$
Beckman		5500 Gamma									
A-245											
8-20-96	A	Sample Tray Area	100	γ	20	860	43.0	39.0	4.0	6.56	
8-20-96	B	" " "	"	"	20	820	41.0	"	2.0	3.28	
8-20-96	C	" " "	"	"	20	760	38.0	"	N.S.D.	N.S.D.	
8-20-96	D	Sample Tray Area	100	γ	20	800	40.0	39.0	1.0	1.64	
A-245											
Packard		Gamma 500 Counter									
8-20-96	A	Sample Tray Area	100	γ	20	820	41.0	39.0	2.0	3.28	
"	B	" " "	"	"	"	760	38.0	"	N.S.D.	N.S.D.	
"	C	" " "	"	"	"	820	41.0	"	2.0	3.28	
"	D	" " "	"	"	"	780	39.0	"	N.S.D.	N.S.D.	
"	E	" " "	"	"	"	760	38.0	"	N.S.D.	N.S.D.	
8-20-96	F	Sample Tray Area	100	γ	20	800	40.0	39.0	1.0	1.64	

D	A
C	B

E	A
F	B
D	C

N.S.D. = Not Significantly Different From Zero = 6%

First-line therapy option
ZIAC®
(bisoprolol fumarate-hydrochlorothiazide)
2.5, 5, & 10 mg Tablets with 6.25 mg HCTZ

S/N 100129

Bendix Corp Model 25621R 15mCi
ECD S/N 18713A (H/P)
Model 2500

First-line therapy option
ZIAC®
(bisoprolol fumarate-hydrochlorothiazide)
2.5, 5, & 10 mg Tablets with 6.25 mg HCTZ

S/N 746B0161

Hewlett Packard ECD Model 2-6195
Ser# A755

Model 5750
2mCi (57548)

First-line therapy option
ZIAC®
(bisoprolol fumarate-hydrochlorothiazide)
2.5, 5, & 10 mg Tablets with 6.25 mg HCTZ

Hewlett Packard Model # 5840A (J. Mayers)
Serial # 2107A0002
ECD Model # 18803-60520
Serial # C1924
Date 11/84

First-line therapy option
ZIAC®
(bisoprolol fumarate-hydrochlorothiazide)
2.5, 5, & 10 mg Tablets with 6.25 mg HCTZ

BK Sweeney MFg Co Static Eliminator
200 mCi Aug 67

First-line therapy option
ZIAC®
(bisoprolol fumarate-hydrochlorothiazide)
2.5, 5, & 10 mg Tablets with 6.25 mg HCTZ

National Research Corp 275 microgram

NRC Model 530A Alphatron 100 microgram

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

JAN 24 1990

License No. 20-00315-02
Docket No. 030-04578
Control No. 111228

Department of the Army
ATTN: Clinton A. Hodder, Colonel, Commander
U.S. Army Natick Research & Development
and Engineer Center
STRNC-ZSR
Natick, Massachusetts 01760-5000

Gentlemen:

This is in reference to your application dated August 23, 1989, to renew License No. 20-00315-02. In order to continue our review, we need the following additional information:

1. In your application, you didn't describe a training program for ancillary personnel (maintenance, security, etc.) and personnel involved in radionuclide work. Please describe a program that will:

   (a) be of sufficient scope to ensure that all personnel using radioactive materials receive proper instruction in accordance with 19.12 of 10 CFR Part 19 (enclosed);

   (b) provide for personnel to be properly instructed before assuming duties with, or in the vicinity of, radioactive materials with retraining as necessary.

   The training given to each group should be commensurate with the duties and responsibilities of the group and need not be the same for each group.

2. Please confirm that personnel will be instructed before beginning duties with, or in the vicinity of, radioactive materials and will be reinstructed whenever there is a significant change in duties, regulations, or the terms of the license.

3. Please confirm whether you still possess the following Electron Capture Detectors (ECD), the number of each, and other specifically licensed ECDs:

   a. Nickel-63 - 2mCi - ECD Model No. 2-6195, Hewlett Packard Model 5750

   b. Nickel-63 - 15mCi - ECD Model No. 18713A, Bendex Corporation Model No. 2500

Nuclear Products Company

Polonium ~~120~~ 210

Varian Vacuum Products
1-800-882-7926

40.22

MEMORANDUM OF CALL

Previous editions usable

TO:

HC Stark

☐ YOU WERE CALLED BY— ☐ YOU WERE VISITED BY—

1-617-969-7690

OF (Organization)

Susan

☐ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

Model 530 AlphaTron
Programs 226Ra
RC Equip. Corp
Top 61 Mass

BY	DATE	TIME

NSN 40-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
Prescribed by GSA
FPMR (41 CFR) 101—11.6

PO: 19
262-080

Feldene
(PIROXICAM)

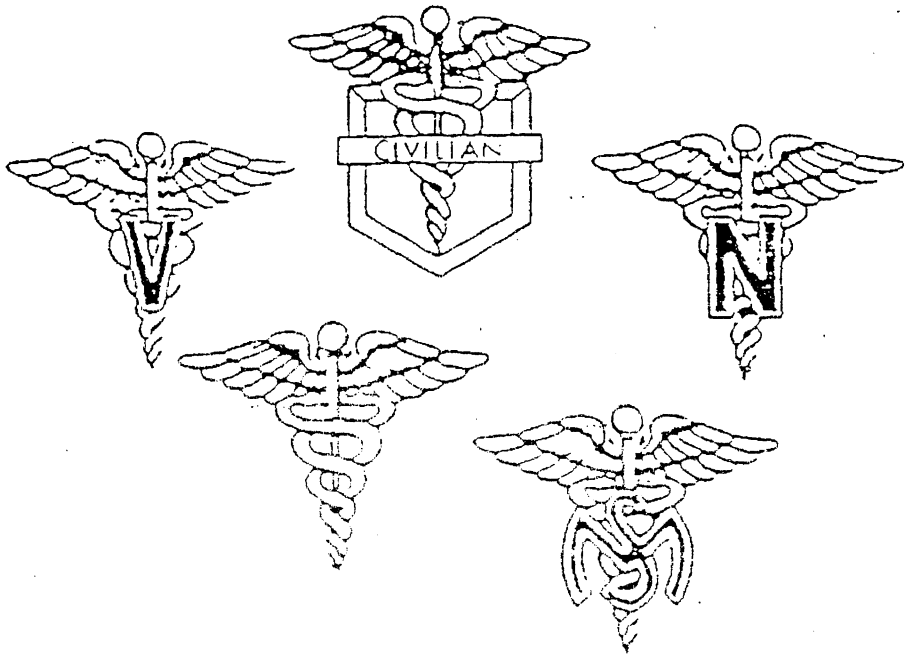
Alpha Tron Vac Gage
21
342-0835

P.01

TRANSACTION REPORT

DEC-14-93 TUE 11:05

DATE	START	SENDER	RX TIME	PAGES	NOTE
DEC-14	11:02	410 671 8263	2'50"	2	OK



UNITED STATES ARMY ENVIRONMENTAL HYGIENE AGENCY

ABERDEEN PROVING GROUND, MD 21010-5422

AEHA

FAX # (410) 671-2084
DSN 584-2084

COMMAND	NAME OFFICE SYMBOL	TELEPHONE NUMBER	AUTHORIZED RELEASER'S SIGNATURE		
FROM: USAEHA	Hilsmeier HPD	DSN 584-3526			
TO: Natick Labs	Angelo SAT NL-ZSR	256-5208	DATE-TIME 14	MONTH	YEAR 93

CLASSIFICATION	NO. PGS.	PRECEDENCE	REMARKS:
Uncl	1	Routine	FAX 256-5270

RADIAC INSTRUMENT DATA SHEET

INSTRUMENT MAKE EBERLINE MODEL NO: E520 SER.NO.2324

PROBE TYPE: HP-177 SERIAL NO:313 RATE_____

CALIBRATION GEOMETRY: [illegible]

SCALE	SOURCE MODE	DISTANCE CM	INSTRUMENT METER READING		ADJUSTMENT
			[illegible]	BEFORE Actual	AFTER Final Actual
[illegible]	[illegible]	309.1	1500	1500	
	[illegible]	80.3	500	500	
[illegible]	[illegible]	[illegible]	[illegible]	135	
	[illegible]	[illegible]	50	55	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	[illegible]	[illegible]	5	[illegible]	
	[illegible]	309.5	1.5	.5	
	[illegible]	[illegible]	.5	.5	
	[illegible]	93.3	.15	.15	
	[illegible]	177.[illegible]	.05	.05	

CALIBRATION REPORT NO.W03HAA025C DATE:5 NOV 93
PAGE [illegible] 2

Gutierrez-Palmenberg, Inc.
2922 W. Clarendon Ave., Phoenix, AZ 85017

Shipment Control #
97-051 / 0263-97

LENGTH	WIDTH	HEIGHT
LEGAL	LEGAL	LEGAL

Tractor 116
Trailer 4008

STRAIGHT BILL OF LADING--ORIGINAL--NOT NEGOTIABLE.
RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading

The property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown). Marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination. If on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination. And as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the uniform domestic straight bill of lading set forth (1) in official, Southern, Western and Illinois Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment. Or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(MAIL OR STREET ADDRESS OF CONSIGNEE-FOR PURPOSES OF NOTIFICATION ONLY.)

FROM : US Army Soldier Sys. Com. Date : 10/01/97
At Natick, MA
CONSIGNED TO: Chem-Nuclear Consolidation Facility
DESTINATION: Barnwell STATE: SC COUNTY: Barnwell
****** EMERGENCY CONTACT: Gutierrez-Palmenberg, Inc. (602) 739-1885 ******

No. Pkgs.	HM	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, LINER NUMBERS, SPECIAL MARKS & EXCEPTIONS	WEIGHT
1	X	Radioactive Material, n.o.s., 7, UN 2982, Fissile Excepted	210 Lbs
		Chk Sources, static eliminators, vac guages, GCD's, contaminated cement & plexiglass in a metal 55 gallon drum	
		RADIONUCLIDES: Cf252,Ra226,Po210,I129,Bi210,Tl204,Ru106, Ba133,C-14,Co60,Cs137,P32,Ni63,H-3,Unat,Th232 — TOTAL ACTIVITY: 247.468632668805 mCi / 9156.33940874579 MBq	
		CHEMICAL FORM: oxides/elemental — PHYSICAL FORM: solid	
		CONTAINER TYPE: 55 gallon metal drum — CONTAINER SPEC.: USA DOT 7A Type A	
		SPEC. LABELS: Radioactive Yellow-II — MARKINGS: Proper Shipping Name	
		PLACARDING: None — NON-EXCLUSIVE USE	
		TI: 1.0	
3	X	Radioactive Material, Excepted Package - Limited Quantity of Material, 7, UN2910	280 Lbs
		Lab trash : brokenglasswware, paper, plastic, rubber, metal in 55 gallon metal drums	
		RADIONUCLIDES: Ca45, C-14, H-3 — TOTAL ACTIVITY: 4.816774 mCi / 178.220638 MBq	
		CHEMICAL FORM: oxides/elemental — PHYSICAL FORM: solid	
		CONTAINER TYPE: 55 gallon metal drum — CONTAINER SPEC.: Strong Tight Container	
		SPEC. LABELS: none — MARKINGS: Radioactive, Consignee/Consignor Address	
		PLACARDING: None — NON-EXCLUSIVE USE	
		TI: N/A	

IMPORTANT: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.
Signature
Company GPI Date 10/01/97
2922 W. Clarendon Ave.
Phoenix, AZ 85017

Received the property described above in good condition, except as otherwise noted.
Carrier Boyles Transportation
Driver Jerry Leone
Date and time 10/01/97

SCHEDULED TO ARRIVE	DATE 10/01/97	TIME 0800 A.M. P.M.	COMPLETED LOADING	DATE 10/01/97	TIME 0900 A.M. P.M.	SHIPPER'S SIGNATURE
ARRIVED AT SHIPPER	DATE 10/01/97	TIME 0810 A.M. P.M.	LEFT SHIPPER	DATE 10/01/97	TIME 0930 A.M. P.M.	SHIPPER'S SIGNATURE

SHIPPER IMPORTANT NOTE: Your signature certifies tha the above dates and times are correct for record keeping and billing purposes.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
Radioactive Waste Shipment Prior Notification and Manifest Form

(Failure to Complete ALL Entries Will Result in Return of Form and Constitute Noncompliance.)

See Reverse Side for Instructions

1. Name and Address of Shipper/Generator: GPI 2922 W. Clarendon Ave. Phoenix, AZ 85017	2. Person Responsible for Waste Shipment: a) Name: David A. Wise b) Title: Broker c) Telephone: (602) 234-0696
3. Radioactive Waste Transport Permit No. X 3487-02-97	4. Shipment Identification No.: 97-051 / 0263-97
5. Location from which waste will be shipped: HQ, US Army Soldier Sys. Com. Natick, MA	6. Name and Address of Consignee: Chem-Nuclear Consolidation Facility Barnwell, SC 29812
7. Scheduled Date of Departure of Shipment: 10/01/97	8. Estimated Date of Arrival of Shipment: 10/02/97

9. Carrier: Boyles Transportation Bilerica, MA	10. Trailer No. & Owner (if available) 4008 BOYLES	11. Type Transport Vehicle: Closed Transport

12. Routes shipment will follow in State of South Carolina (Be Specific):
I-77 to I-26 to Rt-6 to SC 64 to CNCF

13. Type Package or Cask Model No.: 55 gallon metal drum	14. Type Container in Cask: N/A	15. Package or Cask Spec.: STRONG TIGHT CONTAINER & USA DOT 7A Type A

16. Complete Waste Description (Be Specific): CHECK SOURCES, GCDS, STATIC ELIMINATORS
~~Instruments & Articles~~ ~~Compasses, watches, meters, collimators~~
DAW: GLASS, PAPER ~~guages~~
PLASTIC, RUBBER, CEMENT, METAL

17. Physical & Chemical Form: SOLID Elemental / OXIDE	18. Total No. of Packages: 4 ~~50~~	19. Prominent Radionuclides: Ni 63, C-14, H-3, Cf 252, Ra 226, Po 210, I 129, Bi 210, Tl 204, Ru 106, Ba 133, Co 60, Cs 137, P 32, Unat, Th 232, Co 45
20. Total Curies: 0.252285406668805 ~~4.5~~	21. Waste Class & Stability: C	22. Total Cubic Feet: 30.0 ~~37.5~~
23. DOT Sub Type: LIMITED QUANTITY Type A	24. DOT Class. & Hazard Class UN No.: 2982, 2910 Radioactive Material,n.o.s., 7, UN 2982, ~~EXCEPTED~~ RADIOACTIVE MATERIAL, ~~NOS~~ EXCEPTED PACKAGE-LIMITED QUANTITY OF MATERIAL, 7, UN2910	25. Hwy. Route Controlled: (Large Quantity) [ ] Yes [X] No

CERTIFICATION

I hereby certify on behalf of the above-named shipper/generator to the South Carolina Department of Health and Environmental Control that the information provided herein is complete and correct to the best of my knowledge; and that the shipper/generator has complied with all the provisions as required by Act No. 429 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, and Department Regulation 61-83.

Date: 09/29/97

David A. Wise
Typed Name

Signature of Consignor's Authorized Representative

CONSIGNEE ACKNOWLEDGEMENT

This acknowledges to the South Carolina Department of Health and Environmental Control that the above-described radioactive waste shipment was received.

Date of Delivery

Signature of Consignee's Authorized Representative

Typed or Printed Name and Title

DHEC 802 (Rev. 10/84)

(Copies of this form may be reproduced locally as needed)

Form RHA-CT
(5/80)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
Radioactive Waste Shipment Certification Form

General Instructions and Information: This is a two part form to be used by shippers and carriers of radioactive waste. The certifications contained herein satisfy the requirements of Section 13-7-150, of Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act. This certification along with a copy of the prior notification form shall accompany each shipment of radioactive waste into and within the State of South Carolina. The shipper is to complete his portion of the form and present it to the carrier as part of the shipping documents. Upon receipt, the carrier shall complete his portion of the form. Upon delivery of the shipment to the consignee, a copy of this certification form, and a copy of the Prior Notification and Manifest form with the consignee acknowledgement, shall be returned to the Department.

Part I: Shipper's Certificate of Compliance

1. Name of Shipper and Address: GPI 2922 W. Clarendon Ave. Phoenix, AZ 85017 Telephone No. (602) 234-0696	2. Shipment Identification No. 97-051 / 0263-97 3. Transport Permit No. X 3487-02-97

In compliance with Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, I hereby certify on behalf of the above-named shipper to the South Carolina Department of Health and Environmental Control that the above-named shipper has complied with all provisions of Act No. 499 of 1980, and all applicable laws and administrative rules and regulations, both State and Federal, regarding the packaging, transportation, storage, disposal and delivery of such wastes. I further certify that this shipment of radioactive waste has been inspected within 48 hours of the time of departure and that no items of non-compliance with applicable laws, rules or regulations were found.

Date 10/01/97

David A. Wise / Broker
Typed Name and Title of Agent of Shipper

Signature

Part II: Carrier's Certification

1. Name of Carrier and Address: Boyles Transportation Billerica, MA Telephone No. (800) 343-2004	2. Shipment Identification No. 97-051 / 0263-97 3. Transport Trailer No. 4008
4. Scheduled Date of Departure of Shipment: 10/01/97	5. Estimated Date of Arrival of Shipment: 10/02/97

Certification is hereby made to the South Carolina Department of Health and Environmental Control that: (a) the shipper has provided the carrier with a copy of the shipment manifest, the certificate of compliance, and the routing instructions; (b) the shipment of radioactive waste has been properly placarded for transport according to applicable U.S. Department of Transportation Regulations; (c) all shipping papers originated or reproduced by the carrier have been properly executed; (d) the transport vehicle has been inspected according to applicable State and Federal regulations within the prescribed intervals and that all safety and operational components are in good working order and meet the requirements of regulations; (e) all drivers who will operate the vehicle within the State of South Carolina are qualified to transport hazardous materials as specified by applicable U.S. Department of Transportation regulations; (f) the Department shall be immediately notified of any variance, occuring after departure, from the shipper's notification of primary routes in South Carolina and estimated date of arrival; (g) all applicable laws and administrative rules and regulations, both State and Federal, regarding the transportation of radioactive wastes will be complied with.

Date 10/01/97

Jerry Leone
Typed or Printed Name and Title

Jerry Leone
Signature

DHEC 803
(5/80)

(Copies of this form may be reproduced locally as needed)

LIMITED QUANTITY CERTIFICATION

CONSIGNEE:	CONSIGNOR:
Chem-Nuclear Consolidation Facility Hwy 64 / Near SRS Gate Barnwell, SC 29812	GPI 2922 W. Clarendon Ave. Phoenix, AZ 85017 @ US Army Soldier Sys. Com Natick, MA

Mark the applicable exception statement

☐ **This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package-limited quantity of material, 7, UN2910.**

☐ **This package conforms to the conditions and limitations specified in 49 CFR 173.424 for radioactive material, excepted package-instruments or articles, 7, UN2910.**

☐ **This package conforms to the conditions and limitations specified in 49 CFR 173.426 for radioactive material, excepted articles manufactured from natural or depleted uranium or natural uranium, 7, UN2910.**

☐ **This package conforms to the conditions and limitations specified in 49 CFR 173.428 for radioactive material, excepted empty packaging, 7, UN2910.**

This applies to the following packages: NAT-1, NAT-2, NAT-3

POTENTIAL HAZARDS

HEALTH HAZARDS

Low-level radioactive material; little personal radiation hazard.
Many packages are not required to have radioactive materials labels or markings.
Some radioactive materials cannot be detected by commonly available instruments.

FIRE OR EXPLOSION

Some of these materials may burn, but none of them ignites readily.
Radioactivity does not change flammability or other properties of the materials.

EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.
Response actions may be performed prior to any radiation measurements.
Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.
Notify Radiation Authority of accident conditions.
Detain uninjured persons, isolate equipment with suspected contamination, and delay cleanup until instruction of Radiation Authority.
CALL CHEMTREC AT 1-800-424-9300 FOR EMERGENCY ASSISTANCE.

FIRE

Do not move damaged containers; move undamaged containers out of fire zone.
Small Fires: Dry chemical, CO_2, water spray or regular foam.
Large Fires: Water spray, fog (flooding amounts).

SPILL OR LEAK

Do not touch damaged containers or spilled material.
Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.
Cover powder spill with plastic sheet or tarp to minimize spreading.

FIRST AID

Use first aid treatment according to the nature of the injury.
Advise medical personnel that victim may be contaminated with low-level radioactive material.

This Emergency Response Guide applies to the following Identification Numbers :

☐	UN2910	Radioactive Material, Excepted Package - Articles Manufactured from Natural or Depleted Uranium or Natural Thorium
☐	UN2910	Radioactive Material, Excepted Package - Empty Packaging
☐	UN2910	Radioactive Material, Excepted Package - Instruments or Articles
☒	UN2910	Radioactive Material, Excepted Package - Limited Quantity of Material

POTENTIAL HAZARDS

HEALTH HAZARDS

External radiation hazard from shielded radioactive material.
Internal radiation hazard from inhalation, ingestion or breaks in skin.
Radioactive material; degree of hazard will vary greatly, depending on type and quantity of radioactive material and type of packaging.
Materials in Special Form or in Type B packaging are not expected to cause contamination in accidents.
Some radioactive materials cannot be detected by commonly available instruments.
Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

Some of these materials may burn, but none of them ignites readily.
Radioactivity does not change flammability or other properties of the materials.

EMERGENCY ACTION

Keep unnecessary people at least 150 feet upwind of spill; greater distances may be necessary for people downwind, or if advised by Radiation Authority.
Isolate hazard area and deny entry.
Response actions may be performed prior to any measurement of radiation; limit entry to shortest possible time.
Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.
Notify Radiation Authority of accident conditions.
Detain uninjured persons, isolate equipment with suspected contamination, and delay cleanup until instruction of Radiation Authority.
CALL CHEMTREC AT 1-800-424-9300 FOR EMERGENCY ASSISTANCE.
If water pollution occurs, notify the appropriate authorities.

FIRE

Do not move damaged containers; move undamaged containers out of fire zone.
Small Fires: Dry chemical, CO_2, water spray or regular foam.
Large Fires: Water spray, fog (flooding amounts).
For massive fire in cargo area, use unmanned hose holder or monitor nozzles.

SPILL OR LEAK

Do not touch damaged containers or spilled material.
Damage to outer container may not affect primary inner container.
Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.
Large Spills: Dike far ahead to collect runoff water.

FIRST AID

use first aid treatment according to the nature of the injury.
If not affecting injury, remove and isolate suspected contaminated clothing and shoes; wrap victim in sheet or blanket before transporting.
If there is no injury, remove and isolate suspected contaminated clothing and shoes; assist person to shower with soap and water and notify Radiation Authority of action.
Advise medical personnel that victim may be contaminated with radioactive material.

This Emergency Response Guide applies to the following Identification Numbers :

☐	UN2918	Radioactive Material, Fissile, n.o.s.
☐	UN2974	Radioactive Material, Special Form, n.o.s.
☒	UN2982	Radioactive Material, n.o.s.

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

SHIPMENT NO.: USA 97-051 PAGE NO 1 OF 1

DRUM NO.: NAT-1

CONTAINER SURFACE 0.02 mR/hr 1 METER: 0.02 mR/hr

CONTAINER WEIGHT: 100 Lbs CONTAINER LABELS: Radioactive

CONTAMINTATION: <200 / <1000

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/MBq)	TOTAL ACTIVITY (mCi/MBq)
1	Bag # 9	Broken Glass, paper,plastic	1	H-3	0.01235	0.01235
2	Bag # 10	Broken Glass, paper,plastic	1	C-14	1.98	1.98
3	Bag # 11	Broken Glass, paper,plastic	1	Ca45	2.141	2.141
4	Plastic Barrel		1	C-14	0.001	0.001
5	Piping		1	C-14	0.001	0.001
	"	"	1	H-3	0.001	0.001
			TOTAL :	H-3	0.01335	
				C-14	1.982	
				Ca45	2.141	
					Grand Total :	4.13635 mCi
						153.0505 MBq

INSTRUMENT TYPE LUDLUM MODEL 19 CALIBRATION DATE: 11/13/97

INSPECTED BY D. WISE LOADED: 9/30/97

As installation Radiation Safety Officer of designee, I certify, based on direct observation or performance that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous wastes (such as lead) are present.

Signature Date 10/1/97

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

SHIPMENT NO.: USA 97-051 PAGE NO 1 OF 1

DRUM NO.: NAT-2

CONTAINER SURFACE 0.02 mR/hr 1 METER: 0.02 mR/hr

CONTAINER WEIGHT: 90 Lbs CONTAINER LABELS: Radioactive

CONTAMINTATION: <200 / <1000

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/MBq)	TOTAL ACTIVITY (mCi/MBq)
1	Bag # 12	Broken Glass, paper,plastic	1	C-14	0.0112	0.0112
	"		1	H-3	0.0112	0.0112
2	Bag # 6	Broken Glass, paper,plastic	1	H-3	0.041384	0.041384
3	Bag # 7	Broken Glass, paper,plastic	1	H-3	0.0159	0.0159
4	Bag # 8	Broken Glass, paper,plastic	1	H-3	0.05817	0.05817
			TOTAL :	H-3	0.126654	
				C-14	0.0112	
					Grand Total :	0.137854 mCi
						5.100598 MBq

INSTRUMENT TYPE LUDLUM MODEL 19 CALIBRATION DATE: 11/13/97

INSPECTED BY D. WISE LOADED: 9/30/97

As installation Radiation Safety Officer of designee, I certify, based on direct observation or performance that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous wastes (such as lead) are present.

John E. Sheehan

Signature

10/1/97

Date

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

SHIPMENT NO.: USA 97-051 PAGE NO 1 OF 1

DRUM NO.: NAT-3

CONTAINER SURFACE 0.02 mR/hr 1 METER: 0.02 mR/hr

CONTAINER WEIGHT: 90 Lbs CONTAINER LABELS: Radioactive

CONTAMINTATION: <200 / <1000

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/MBq)	TOTAL ACTIVITY (mCi/MBq)
1	Bags # 1-5	Broken Glass, paper,plastic	1	H-3	0.54242	0.54242
			TOTAL :	H-3	0.54242	
					Grand Total :	0.54242 mCi
						20.06954 MBq

INSTRUMENT TYPE LUDLUM MODEL 19 CALIBRATION DATE: 11/13/97

INSPECTED BY D. WISE LOADED: 9/30/97

As installation Radiation Safety Officer of designee, I certify, based on direct observation or performance that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous wastes (such as lead) are present.

Signature Date 10/1/97

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

SHIPMENT NO.: USA 97-051 PAGE NO 1 OF 2

DRUM NO.: NAT-4

CONTAINER SURFACE 24 mR/hr 1 METER: 1.0 mR/hr

CONTAINER WEIGHT: 210 Lbs CONTAINER LABELS: Yellow-II

CONTAMINTATION: <200 / <1000

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/MBq)	TOTAL ACTIVITY (mCi/MBq)
1	Chk Source		1	Cf 252	3.20E-07	3.2E-07
2	Vac Guage	Alphatron Model # 58796	1	Ra 226	0.275	0.275
3	Vac Guage	Alphatron Model # 530	1	Ra 226	0.1	0.1
4	Chk Source		1	Po 210	4.76E-05	4.76E-05
5	Chk Source		1	I 129	1E-06	1E-06
6	Chk Source		1	Bi 210	8.03E-08	8.03E-08
7	Chk Source		1	Tl 204	9.59E-08	9.59E-08
8	Chk Source		1	Ru 106	6.08E-08	6.08E-08
9	Chk Source		1	Ba 133	0.0015	0.0015
10	Chk Source		1	Ba 133	5.00E-04	0.0005
11	Chk Source		1	C-14	2.04E-08	2.04E-08
12	Chk Source		1	C-14	6.97E-06	6.97E-06
13	Chk Source		1	C-14	0.0022	0.0022
14	Chk Source	Tracerlab S/N B-311	1	Co 60	0.00641	0.00641
15	Chk Source		1	Co 60	1.51E-10	1.51E-10
16	Chk Source		1	Co 60	0.0005	0.0005
17	Chk Source		1	Co 60	4.24E-08	4.24E-08
18	Chk Source		1	Co 60	3.82E-10	3.82E-10
19	Chk Source		1	Co 60	4.32E-10	4.32E-10
20	Chk Source		1	Co 60	9.64E-09	9.64E-09
21	Chk Source		1	Cs 137	0.0001	0.0001
22	Chk Source		1	Cs 137	0.0001	0.0001
23	Chk Source		1	Cs 137	0.0001	0.0001
24	Chk Source		1	Cs 137	0.0001	0.0001
25	Chk Source		1	Cs 137	3.42E-08	3.42E-08
26	Chk Source		1	Cs 137	3.42E-08	3.42E-08

INSTRUMENT TYPE LUDLUM MODEL 19 CALIBRATION DATE: 11/13/97

INSPECTED BY D. WISE LOADED: 9/30/97

As installation Radiation Safety Officer of designee, I certify, based on direct observation or performanc that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous wastes (such as lead) are present.

Signature Date 10/1/97

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

CONTINUATION SHEET

PAGE NO. 2 OF 2

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/TBq)	TOTAL ACTIVITY (mCi/TBq)
26	Check Source		1	P 32	2.64E-05	2.64E-05
27	ECD	S/N C1924	2	Ni 63	15	30
28	ECD	S/N A755	1	Ni 63	2	2
29	ECD	S/N 18713A	1	Ni 63	15	15
30	Plex Cube		1	C-14	0.001	0.001
31	Static Eliminator	Model # 7777	1	H-3	200	200
32	Plex Cube		1	H-3	0.001	0.001
33	Refer Door		1	H-3	0.001	0.001
34	Cement	Solidified Liquids	1	U nat	0.05	0.05
	"		1	Th 232	0.02904	0.02904
			Totals :	Cf 252	3.2E-07	
				Ra 226	0.375	
				Po 210	4.76E-05	
				I 129	1E-06	
				Bi 210	8.03E-08	
				Tl 204	9.59E-08	
				Ru 106	6.08E-08	
				Ba 133	0.002	
				C-14	0.0032069904	
				Co 60	0.00691005301	
				Cs 137	0.0004000684	
				P 32	2.64E-05	
				Ni 63	47	
				H-3	200.002	
				U nat	0.05	
				Th 232	0.02904	
	Source Mat =				Grand Total :	247.468632668805 mCi
						9156.33940874579 MBq

VEHICLE INSPECTION SHEET

GPI Shipment # USA 97-051 Disposal Shipment # USA 97-051

Carrier name/address USDOT Hazmat Reg # Tractor # Trailer #

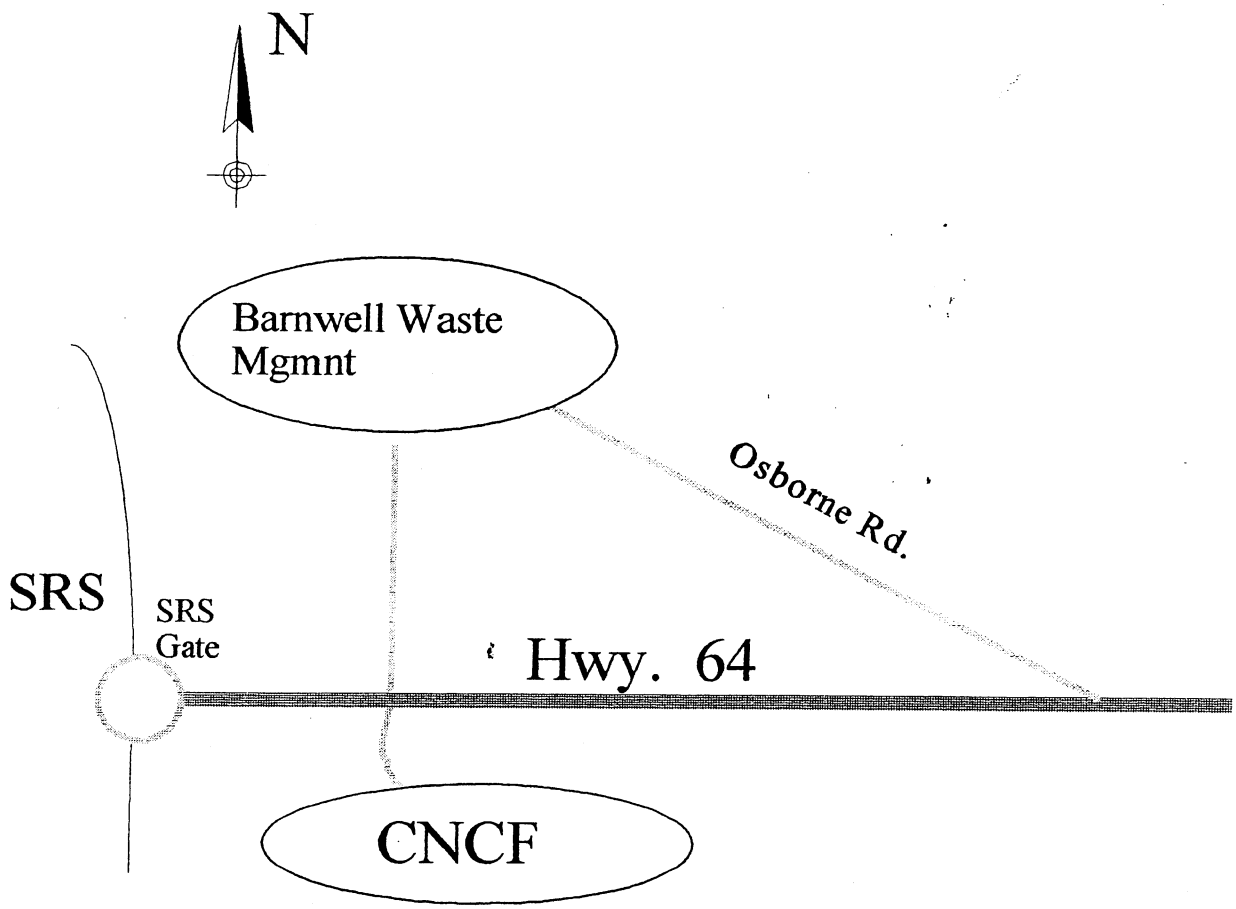
Boyle Transportation 116 4008

Billerica MA

Driver's Name: Jerry Leone State: MA License #: 026480210 Exp Date: 5-14-98

1	Operator'sLicense	(X)SAT ( ) UNSAT	Driver possesses valid commercial driver's license (with a tank vehicle /hazardous materials endorsement)
2	Windshield, Side Glass & Mirror	(X)SAT ( ) UNSAT	No cracked or broken glass that would affect the driver's vision. Mirror(s) in place and usable.
3	Wipers	(X)SAT ( ) UNSAT	Wipers operate and are in good condition.
4	Horn	(X)SAT ( ) UNSAT	Air/electric horn works.
5	Suspension	(X)SAT ( ) UNSAT	Visually check for loose, broken, or damaged spring leaves, "U" bolts, shackles, pads, torque arms, and locking pins.
6	Brake Lines	(X)SAT ( ) UNSAT	Brake lines and connectors do not have cracks, crimps, restrictions, or evidence of damage or audible air leaks.
7	Brake Pots & Cams	(X)SAT ( ) UNSAT	Brake pots are in good physical condition and mechanical linkages are intact and in good condition.
8	Exhaust System	(X)SAT ( ) UNSAT	No loose or broken brackets and no evidence of leaks which would affect driving/sleeping compartment.
9	Fuel System	(X)SAT ( ) UNSAT	No damage affecting fuel tank integrity, no visible leaks, no loose or broken mounting brackets, no evidence of damage to vents, and fuel cap is securely in place.
10	Structure&Welds	(X)SAT ( ) UNSAT	No cracks in load bearing welds or assemblies.
11	Frame	(X)SAT ( ) UNSAT	No cracked, loose, sagging, or broken frame.
12	Van/Trailer Floor	(X)SAT ( ) UNSAT	No holes or projecting nails. Capable of bearing weight of load and fork truck (if used).
13	Van walls, ceiling	(X)SAT ( ) UNSAT	No holes, severe dents, or buckling.
14	Van doors	(X)SAT ( ) UNSAT	Can be closed and secured properly.
15.	Rims	(X)SAT ( ) UNSAT	Rims are not bent or cracked, and stud nuts are in place.
16	Tires	(X)SAT ( ) UNSAT	Tires appear properly inflated, tread depths appear greater than minimum (major tread depth at least 1/8" on front and 1/16" on all others) and show no evidence of cuts or damage affecting the plycord.
17	Hubs	(X)SAT ( ) UNSAT	Oil level visible, no visible oil leakage from seals.
18	Head lights	(X)SAT ( ) UNSAT	Both low beams working.
19	Running Lights	(X)SAT ( ) UNSAT	All affixed running lights operable.
20	Turn Signals	(X)SAT ( ) UNSAT	Front and back working.
21	Brake Lights	(X)SAT ( ) UNSAT	Must work on tractor and trailer.
22	Bracing	(X)SAT ( ) UNSAT	Bracing/shoring must be sufficient to prevent shifting of lading during conditions normally incident to transportation.

Tractor & Trailer (X) are ( ) are not acceptable for use.


N
Barnwell Waste
Mgmnt
Osborne Rd.
SRS
SRS
Gate
Hwy. 64
CNCF

FORM 540 CHEM-NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST (SHIPPING PAPER)

1. EMERGENCY TELEPHONE NUMBER (INCLUDE AREA CODE): (602) 739-1885

ORGINIZATION: Gutierrez-Palmenberg, Inc.

2. "EXCLUSIVE USE" SHIPMENT? [ ] YES [X] NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST: 4

4. Does EPA Pegulated-waste requiring a manifest accompany this shipment? [ ] YES [X] NO

IF "Yes," manifest number-->

EPA MANIFEST NUMBER: N/A

5. Shipper-Name and Facility
GPI
2922 W. Clarendon Ave
Phoenix, AZ 85017

S.C. TRANSPORT PERMIT #: X 3487-02-97

SHIPMENT NUMBER: USA 97-051

CONTACT: Mr. Walter Cunningham

6. CARRIER-Name and Address
Boyles Transportation
15 Riverhurst Rd.
Billerca, MA

CONTACT: Rick Araniz

SIGNATURE-Authorized carrier acknowledging waste receipt: Perry Leone

SHIPMENT ID NUMBER: SCN 0263-97

X COLLECTOR
PROCESSOR
GENERATOR
TYPE (SPECIFY)

TELEPHONE NUMBER: (602) 234-0696

EPA I.D. NUMBER: N/A

SHIPPING DATE: 10/01/97

TELEPHONE NUMBER: (800) 343-2004

DATE: 10/01/97

7. FORM 540 & 540A — PAGE 1 OF 1 PAGE(S)
FORM 541 & 541A — 2 PAGE(S)
FORM 542 & 542A — 1 PAGE(S)
ADDITIONAL INFORMATION — PAGE(S)

8. MANIFEST NUMBER (Use this number on all continuation pages): SCN-0263-97

9. CONSIGNEE- Name and Facility Address
CHEM-NUCLEAR SYSTEMS, INC. CNCF
HWY 64 (1 MILE WEST OF SNELLING)
BARNWELL, SC 29812

CONTACT: INVENTORY CONTROL

TELEPHONE NUMBER (Include Area Code): 803/259-1119

SIGNATURE-Authorized consignee acknowledging waste receipt

DATE

10. CERTIFICATION — This is to certify that the herein-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. This also certifies that the materials are classified, packaged, marked and labeled and are in proper condition for transportation and disposal as described in accordance with the requirements of 10 CFR Parts 20 and 61, or equivalant state regulations.

AUTHORIZED SIGNATURE

TITLE: Broker

DATE: 10/01/97

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information)	12 DOT LABEL RADIOACTIVE"	13 TRANSPORT INDEX	14 PHYSICAL AND CHEMICAL FORM	15 INDIVIDUAL RADIONUCLIDES	16 TOTAL PACKAGE ACTIVITY MBq	mCi	17 LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (USE APPROPRIATE UNITS)	19 IDENTIFICATION NUMBER OF PACKAGE
RADIOACTIVE MATERIAL, n.o.s., 7, UN2982 Fissile Excepted (chk sources, GCD's, guages, solidified liquids, plexiglass)	Yellow-II	1	SOLID, OXIDES, Elemental	Cf252, Ra226, Po210, I129, Bi210, Tl204, Ru106, Ba133, C-14, Co60, Cs137, P32 Ni63, H-3, Unat, Th232	9156.33940874579	247.468632668805	N/A	7.5 ft3	Nat-4
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-LIMITED QUANTITY of MATERIAL, 7, UN 2910 (contaminated glass, paper, plastic, rubber, metal)	Radioactive	0.1	SOLID, Oxides Elemental	Ca 45, C-14, H-3	153.0505	4.1365	N/A	7.5 ft3	Nat-1
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-LIMITED QUANTITY of MATERIAL, 7, UN 2910 (contaminated glass, paper, plastic, rubber, metal)	Radioactive	0.1	SOLID, Oxides Elemental	C-14, H-3	5.100598	0.137854	N/A	7.5 ft3	Nat-2
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-LIMITED QUANTITY of MATERIAL, 7, UN 2910 (contaminated glass, paper, plastic, rubber, metal)	Radioactive	0.1	SOLID, Oxides Elemental	H-3	20.06954	0.54242	N/A	7.5 ft3	Nat-3

FOR CONSIGNEE USE ONLY

20. "Certification is hereby made to the South Carolina Department of Health and Environmental Control that this shipment of low-level radioactive waste has been inspected in accordance with the requirements of South Carolina Radioactive Material License 287-04 as amended, and the effective consolidation facility acceptance criteria, within 48 hours prior to shipment, and further certification is made that the inspection revealed no items of non-compliance with all applicable laws, rules and regulations."

Date: 10/01/97 ~~09/17/97~~ Signature

Title and Orginization: Broker / GPI

Telephone No. (602) 234-0696

FORM 541

CHEM-NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control,Transfer and Disposal of Radioactive Waste

1. MANIFEST TOTALS

	# OF PKGS/	NET WASTE VOLUME	NET WASTE WEIGHT	SPECIAL NUCLEAR MATERIAL (grams) U-233	U-235	Pu	TOTAL
	4	m3 ~~0.73~~ 0.778	113.64	NP	NP	NP	NP
		ft3 26	250				

ACTIVITY(MBq/mCi)

	ALL NUCLIDES	TRITIUM	C-14	Tc-99	I-129	SOURCE
MBq	~~9314.5609467458~~ 9331.554496794	7425.323688	73.86705864	NP	1E-06	kg 0.334423
mCi	~~252.285406668865~~ 252.2832266881	200.684424	1.9964069904			lb 0.737

2.MANIFEST NUMBER: SCN 0263-97

3. PAGE_1_OF_2_PAGE(S)

4.SHIPPER NAME: GPI

SHIPMENT ID NUMBER: SCN 0263-97

DISPOSAL CONTAINER DESCRIPTION / WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER

5. CONTAINER IDENTIFICATION NUMBER/ S.C.TRANSPORT PERMIT NUMBER	6. CONTAINER DESCRIPTION (See Note 1 & Note 1A)	7. VOLUME m3 / ft3	8. WASTE AND CONTAINER WEIGHT kg / lb	9. SURFACE RADIATION LEVEL mSv/hr / mrem/hr	10. SURFACE CONTAMINATION MBq/100 cm2 / dpm/100 cm2 ALPHA	BETA-GAMMA	11. WASTE DESCRIPTOR (See Note 2 & Note 2A)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER m3 / ft3	13. SOLIDIFICATION OR STABILIZATION MEDIA (Note 3 &3A)	14. CHEMICAL DESCRIPTION: CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF>0.1%	15. RADIOLOGICAL DESCRIPTION: INDIVIDUAL RADIONUCLIDES AND ACTIVITY AND CONTAINER TOTAL; OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT: RADIONUCLIDES	MBq	mCi	16 WASTE CLASS (A-S-CLASS A, STABLE ALL-A UNSTABLE, B-CLASS B, C-CLASS C)
Nat-1 0137-00-97E	4	0.21 ======= 7.5	45.45 ======= 100	0.0002 ======= 0.02	< 2e-4 ======= < 200	< 1e-3 ====== < 1000	35 / 39 H	0.21 ========== 7.5	100	OXIDE / NP	NP	Ca 45 C-14 H-3 Total :	79.217 73.334 0.49395 153.04495	2.141 1.982 0.01335 4.13635	AU
Nat-2 0137-00-97E		0.21 ======= 7.5	40.91 ======= 90	0.0002 ======= 0.02	< 2e-4 ======= < 200	< 1e-3 ====== < 1000	35/39 H	0.21 ========== 7.5	100	OXIDE / NP	NP	C-14 H-3 Total :	0.4144 4.686198 5.100598	0.0112 0.126654 0.137854	AU
Nat-3 0137-00-97E	2	0.21 ======= 7.5	40.91 ======= 90	0.0002 ======= 0.02	< 2e-4 ======= < 200	< 1e-3 ====== < 1000	35 / 39 H	0.21 ========== 7.5	100	Oxide / NP	NP	H-3 Total :	20.06954 20.06954	0.54242 0.54242	AU
		=======	=======	=======	=======	======		==========							
		=======	=======	=======	=======	======		==========							
		=======	=======	=======	=======	======		==========							

NOTE 1: Container Description codes. For containers/ waste requiring disposal in approved structural overpks the numerical code must be followed by "-OP."

1. Wooden Box
2. Metal Box
3. Plastic Drum
4. Metal Drum
5. Metal tank or liner
6. Concret tank or liner
7. Polyethylene tank or liner
8. Fiberglass Tank or Liner
9. Demineralizer
10. Gas Cylinder
11. Bulk,Unpackaged waste
12. Unpackaged Components
13. High Integrity Container
19. Other describe in 6

NOTE 1A: Barnwell Specific Container Description Codes. (Choose one code as may be applicable.)

A High Integrity Container-Poly
B High Integrity Container-Poly w/ Steel Shell
C High Integrity Drum Overpack- Poly
D High Integrity Container-Stainless Steel
E High Integrity Container-Fiberglass
F Liner-Steel

Note 2: Waste Descriptor Codes. (Choose up to three which predominate by volume.)

20. Charcoal
21. Incinerator Ash
22. Soil
23. Gas
24. Oil
25. Aqueous Liquid
26. Filter Media
27. Mechanical Filter
28. EPA or State Hazardous
29. Demolition Rubble
30. Cation Ion-exchange Media
31. Anion Ion-exchange Media
32. Mixed Bed Ion-exchange Media
33. Contaminated Equipment
34. Organic Liquid (except oil)
35. Glassware or Labware
36. Sealed Source/Device
37. Paint or Plating
38. Evaporator Bottoms/Sludges/Concentrates
39. Compactible Trash
40. Noncompactible Trash
41. Animal Carcass
42. Biological Material (except animal carcass)
43. Activated Material
59. Other, Describe in Item 11, or additional page

Note 2A: Barnwell Specific Waste Descriptor Codes (Choose all applicable codes.)

G Dewatered
H Solid
I Combustible
J Non-combustible
K Air Filtration Filters
L Asbestos

Note 3: Solidification and Stabilization Media Codes

For media meeting disposal site structural stability requirements, the numerical code must be followed by "s"

For all solidification media the vendor and brand name must also be identified in Item 15.Code 100=none req.

Solidification

90. cement
91. concrete (encapsulation)
92. Bitumen
93. Vinyl Chloride
94. Vinyl Ester Styrene
99. Other, Describe in Item 13, or additional page
100. None Required

Note 3A: Barnwell Specific Solidification and Stabilization Media Codes. (Choose this code if applies)

M Wax Binder

M 541

CHEM-NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

2. MANIFEST NUMBER: SCN 0263-97

3. PAGE_2_OF_2_PAGE(S)

DISPOSAL CONTAINER DESCRIPTION / WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER

CONTAINER IDENTIFICATION NUMBER/ S.C.TRANSPORT PERMIT NUMBER	6. CONTAINER DESCRIPTION (See Note 1 & Note 1A)	7. VOLUME m3 / ft3	8. WASTE AND CONTAINER WEIGHT kg / lb	9. SURFACE RADIATION -LEVEL mSv/hr / mrem/hr	10. SURFACE CONTAMINATION MBQ/100 cm2 / dpm/100 cm2 ALPHA	BETA-GAMMA	11. WASTE DESCRIPTOR (See Note 2 & Note 2A)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER m3 / ft3	13. SOLIDIFICATION OR STABILIZATION MEDIA (Note 3 &3A)	14. CHEMICAL DESCRIPTION: CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF>0.1%	15. RADIOLOGICAL DESCRIPTION: INDIVIDUAL RADIONUCLIDES AND ACTIVITY AND CONTAINER TOTAL; OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT: RADIONUCLIDES	MBq	mCi	16. WASTE CLASS (AS-CLASS A, STABLE ALL-A UNSTABLE, B-CLASS B, C-CLASS C)
Nat-4 0137-00-97E	4	0.21	95.45	0.24	< 2e-4	< 1e-3	36H	0.014	100	Oxides/ NP	NP	Cf 252	1.184E-05	3.2E-07	C
		7.5	210	24	< 200	< 1000		0.5				Ra 226	13.875	0.375	
												Po 210	0.0017612	4.76E-05	
												I 129	3.7E-05	1E-06	
												Bi 210	2.971E-06	8.03E-08	
												Tl 204	3.548E-06	9.59E-08	
												Ru 106	2.25E-06	6.08E-08	
												Ba 133	0.074	0.002	
												C-14	0.08165864	0.0022069904	
												Co 60	0.25567196	0.00691005301	
												Cs 137	0.01480253	0.0004000684	
												P 32	0.0009768	2.64E-05	
												Ni 63	1739	47	
												H-3	7400	200	
												Total :	9153.30392874597	247.38659266881	
							39H	0.028	100	Oxides / NP	NP	H-3	0.074	0.002	AU
								1				C-14	0.037	0.001	
												Total :	0.111	0.003	
							SOLIDIFIED LIQUIDS 59H	0.056	90	Oxides / NP	NP	Th 232	1.07448	0.02904	AU
								2				U nat	1.85	0.05	
												Total :	2.92448	0.07904	
												SOURCE MAT =	334.423 g		
													0.737 Lb		

FORM 542

CHEM-NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

MANIFEST INDEX AND REGIONAL COMPACT TABULATION

1. WASTE COLLECTOR/PROCESSOR

NAME Gutierrez-Palmenberg, Inc. (GPI)

S.C. RADIOACTIVE WASTE TRANSPORT PERMIT NUMBER X 3487-02-97

SHIPPING DATE 10/01/97

SHIPPER USE ONLY

2. MANIFEST NUMBER SCN 0263-97

3. PAGE_1_OF_1_PAGE(S)

4. SC TRANSPORT PERMIT #	5. GENERATOR NAME AND TELEPHONE NUMBER	6. GENERATOR FACILITY ADDRESS	8A. WASTE DESCRIPTION (NOMENCLATURE)	7. PREPROCESSED WASTE (OR MATERIAL) VOLUME (m3)	(ft3)	8. MANIFEST NUMBER(S) UNDER WHICH WASTE (OR) MATERIAL REC. & DOR.	9. WASTE CODE P=PROCESSED C=COLLECTED	10. ORIGINATING COMPACT OR STATE	11. AS PROCESSED/COLLECTED TOTAL A. SOURCE MATERIAL (kg)	(lb)	B. SNM (g)	C. ACTIVITY (MBq)	(mCi)	D. VOLUME (m3)	(ft3)	E. WEIGHT (lb)	F. MAXIMUM PACKAGE RADIATION LEVEL (mrem/hr)
0137-00-97-E	Paul Angelis (508) 233-5208	HQ, US Army Soldier Sys. Com. Kansas, St Natick, MA 01760-5409	glass,paper,plastic,rubber metal, plexiglass 35 / 39 H	N/A	N/A	N/A	C	MA	NP	NP	NP	178.326088	4.819624	0.658	23.5	100	24
			chk sources, GCD's, guage 36H	N/A	N/A	N/A	C	MA	NP	NP	NP	9153.30392874597	247.38859266881	0.014	0.5	20	
			solidifed liquids 59H	N/A	N/A	N/A	C	MA	0.334423	0.737	NP	2.92448	0.07904	0.056	2	130	
TOTALS OF ALL PAGES (FORMS 542 AND 542A)									0.334423	0.737	0	9334.55449674597	252.28525666881	0.728	26	250	N / A

WIPE TESTS

<.002 mR at Contact

DATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm²	Bq/100 cm²
Stephenson T 5.729 26/90	1 <1.0pCi 4/20/90	Outside Container	100	γ	10	254	25.4	26.5	N.S.O.		
I 6.54pCi 1/25/90	1 <1.0pCi 4/13/90	Outside Container	100	γ	10	231	23.1	25.5	N.S.O.		
I 14.03pCi 7/11/89	1 <1.0pCi 4/24/90	Outside Container	100	γ	10	267	26.7	26.4	0.3	0.59	
I 1.2pCi 3/13/90	5/13/90 <1.0pCi	Outside Container	100	γ	10	270	27.0	26.8	0.2	0.35	
I 6.7pCi 28/90 Stephenson	5/31/90 <1.0pCi	Outside Container	100	γ	10	268	26.8	27.5	N.S.O	N.S.O	
I 3.0pCi Bars	7/26/90	Outside Container	100	γ	10						
	"	" "	"	"	10						
Ion <0.1pCi	7/26/90	Outside Container	100	γ	10						

*N.S.O. Not Significantly different from Lcrc

WIPE TESTS 51% Eff.

ATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm²	Bq/100 cm²
[illegible] Oct 89 [illegible] I. 0.6 [illegible]	1	Outside Waste Container	100	γ	10	248	24.8	25.1	N.S.O.		
[illegible] Oct 89 [illegible] I	1	Outside Waste Container	100	γ	10	267	26.7	26.7	N.S.O		
[illegible] Oct. [illegible] I [illegible]		Outside Container Waste	100	γ	10	258	25.8	25.9	N.S.O		
[illegible] Oct [illegible] I [illegible]	1	Outside Waste Container	100	γ	10	248	24.8	25.3	N.S.O		
[illegible] Oct [illegible] I [illegible]	1	Outside Waste Container	100	γ	10	248	24.8	25.3	N.S.O		
[illegible] Oct 89 [illegible]	1	Outside Waste Container	100	γ	10	265	26.5	26.1	0.4	0.78	
[illegible] Oct 89 [illegible]	1	Outside Waste Container	100	γ	10	288	28.8	26.4	2.4	4.7	
[illegible] 90 [illegible]	1	" " "	100	γ	10	245	24.5	25.8	N.S.O	N.S.O	
[illegible]					10		2				
[illegible] 90 [illegible]	1	Out Side Waste Bag	100	γ	10	236	23.6	24.9	N.S.O	N.S.O	
[illegible]	1	Outside Waste Bag	100	γ	10	264	26.4	270	N.S.O.	N.S.O	
[illegible] March 90	<1.0										
[illegible] 3.33	7-14-89										
5.33	<1.0 3-13-90	Outside Container	100	γ	10	258	25.8	26.8	N.S.O.	N.S.O	
14.7	<1.0 3-14-90	Outside "	"	γ	10	263	26.3	26.4	N.S.O	N.S.O	
[illegible]	3-15-16-19										
5.6 [illegible]	0.49	Outside Container	100	γ	10	253	25.3	25.7	N.S.O.	N.S.O	
3.6 "	0.32 [illegible]	" "	"	"	10	263	26.3	26.2	0.1	0.2	
5.53 [illegible]	0.49	" "	100	γ	10	259	25.9	26.0	N.S.O	N.S.O	
[illegible]			10								

WIPE TESTS

<.001 MR. at Contact

ATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm²	Bq/100 cm²
Pease	1	Outside Container	100	βγ	10	248	24.8	23.6	1.2	2.35	3.92×10^{-2}
2-88	2	Outside Container	100	βγ	10	244	24.4	23.6	0.8	1.57	2.61×10^{-2}
...ci ^{125}I	1-12-88										
...ci-^{125}I	7-13-88 <1.0 μci										
...eva	1	Outside Container	100	βγ	10	231	23.1	24.5	N.S.O	N.S.O	
-6-88	2	" "	"	"	"	277	27.7	"	3.2	6.27	1.04×10^{-1}
^{125}I <1 μci	3	" "	"	"	"	261	26.1	"	1.6	3.12	5.23×10^{-2}
.15 μci	4	Outside Container	100	βγ	10	277	27.7	24.5	3.2	6.27	1.04×10^{-1}
Graemer	1	Outside Container	100	γ	10	240	24.0	25.2	N.S.O	N.S.O.	
-16-88	^{125}I <1.0 μci										
Pease	^{125}I <1.0 μci	Outside Container	100								
-17-88	1	" "	100	γ	10	259	25.9	25.3	0.6	1.18	1.96×10^{-2}
-18-88	1	" "	100	γ	10	268	26.8	25.1	1.7	3.33	5.56×10^{-2}
eva	^{125}I <1.0 μci	Outside Container	100	γ	10	242	24.2	24.6	N.S.O	N.S.O	
-July-88	<1.0 μci	" "	100	γ	10	233	23.3	23.4	N.S.O	N.S.O	
μci Total	<1.0 μci	" "	100	γ	10	243	24.3	24.0	0.3	0.59	9.8×10^{-3}
Barn	Nov. 22-23-24										
Graemer	^{125}I <1.0 μci	Outside Container	100	γ	10	248	24.8	25.2	N.S.O	N.S.O	
...Jun 88	19 Dec. 88										
.33 μci											
...eva	^{125}I <1.0 μci	Outside Container	100	γ	10	512	25.6	25.0	0.6	1.18	1.96×10^{-2}
...Mayes	" "		"	"	"	502	25.1	"	0.1	0.196	3.27×10^{-3}
	" "	Outside Container	100	γ	10	584	29.2	"	4.2	8.24	1.37×10^{-1}
Graemer	^{125}I <1.0 μci	Outside Container	100	γ	10	486	24.3	25.0	N.S.O.	N.S.O.	
Mayes	<3.66 μci - 12-28-88										

ATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm²	Bq/100 cm²
va	^{125}I <1.0μCi	Outside Container	100	BY	10	139	13.9	14.1	NDA		
-13-87	^{125}I <1.0μCi	" "	100	BY	10	142	14.2	14.3	NDA		
eva	^{125}I <1.0μCi	Outside Container	100	BY	10	133	13.3	13.8	NDA		
-26-87	^{125}I <1.0μCi	" "	100	BY	10	135	13.5	13.8	NDA		
eva	^{125}I <1.0μCi	Outside Container	100	BY	10	14.3	14.3	11.9	2.4	8.0	1.33×10^{-1}
-22-87											
-23-87	^{125}I <.8μCi	Outside Container	100	BY	10	13.3	13.3	13.4	NDA		
-26-87	^{125}I <1.0μCi	" "	"	"	"	11.9	11.9	12.9	NDA		
-27-87	^{125}I <1.0μCi	" "	"	"	"	12.8	12.8	12.8	0.8	2.67	4.45×10^{-2}
-28-87	^{125}I <1.0μCi	Outside Container	100	BY	10	130	13.0	127	0.3	1.0	1.67×10^{-2}
amer	^{125}I 2.12μCi	Outside Container	100	BY	10	134	13.4	13.1	0.1	0.333	5.56×10^{-3}
/18/87	(8/26/87)										
/13/87	1/13/88	Outside Container	100	BY	10	140	14.0	142	N.S.O		
4.1μCi	<1.0μCi										
/28/88	^{125}I 6.48μCi	Outside Container	100	BY	10	14.1	14.1	14.4	N.S.O.		
	(7/31/87										
-16/88	^{125}I 6.93μCi	Outside Container	100	BY	10	212	21.2	22.0	N.S.O.		
6.83μCi											
eva	^{125}I <1.0μCi	Outside Container	100	BY	10	240	24.0	24.1	N.S.O		
-17-88											
ssemer	^{125}I 5.93μCi	Outside Container	100	BY	10	224	22.4	23.5	N.S.O		
-6-88	<1.0μCi										
	^{125}I 7.33μCi	Outside Container	100	BY	10	218	21.8	22.4	N.S.O		
-10-88	<1.0μCi										
nsemer	^{125}I 8.83μCi	~~Out~~ Outside Container	100	BY	10	26.1	26.1	22.7	3.4	6.67	1.11×10^{-1}
7-6-88	<1.0μCi										
7-7-88	^{125}I 3.33μCi	Outside Container	100	BY	10	263	26.3	22.7	3.6	7.06	1.18×10^{-1}
	<1.0μCi										

N.S.O - NOT SIGNIFICANT & different from Zone

ATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm²	Bq/100 cm²
...bose 3-2-87	^{125}I 2.7 pci	Outside Container	100	Bγ	10	149	14.9	13.4	1.5	5.0	8.33×10^{-2}
...mer 3-11-87	^{125}I 5.4 pci	Outside Container	100	Bγ	10	145	14.5	14.2	0.3	1.0	1.67×10^{-2}
" 3-30-87	^{125}I 4.29 pci	" "	100	Bγ	10	143	14.3	14.7	NDA	NDA	
...mer 3-3-87	^{125}I 1 pci	Outside Container	100	Bγ	10	139	13.9	14.2	NDA	NDA	
...mer 4-1-87	^{125}I 8.9 pci	Outside Container	100	Bγ	10	136	13.6	13.4	0.2	0.67	1.12×10^{-2}
...ond 4-6-87	^{125}I 1 pci	Outside Container	100	Bγ	10	140	14.0	13.9	NDA	NDA	
...mer 4-14-87	^{125}I 8.9 pci	Outside Container	100	Bγ	10	141	14.1	14.2	NDA	NDA	
...ena 5-7-87	^{125}I 5.6 pci	Outside Container	100	Bγ	10	139	13.9	14.3	NDA	NDA	
" "	^{125}I 7 pci	" "	"	"	"	142	14.2	14.3	NDA	NDA	
...mer	^{125}I 5.28 pci	Outside Container	100	Bγ	10	137	13.7	14.2	NDA	NDA	
...3-87	3.96 pci	" "	"	"	10	141	14.1	14.2	NDA	NDA	
...14-87	^{125}I 7.92 pci	" "	"	"	"	135	13.5	13.6	NDA	NDA	
...15/87	^{125}I 5.28 pci	" "	"	"	"	142	14.2	14.1	0.1	0.33	5.5×10^{-3}
...16/87	^{125}I 3.96 pci	" "	"	"	"	139	13.9	14.1	NDA	NDA	
...ad 5/2-2-87	^{125}I 2 pci	Outside Container	100	Bγ	10	140	14.0	14.3	NDA	NDA	
...mer ...9/87	^{125}I 5.28 pci	Outside Container	100	Bγ	10	138	13.8	14.1	NDA	NDA	
...mer ...10/87	^{125}I 7.92 pci	Outside Container	100	Bγ	10	140	14.0	13.9	0.1	0.33	5.5×10^{-3}
...22/87	^{125}I 9.24 pci	Outside Container	100	Bγ	10	131	13.1	13.3	NDA	NDA	
...23/87	^{125}I 5.18 pci	" "	"	Bγ	"	126	12.6	12.9	NDA	NDA	
...24/87	^{125}I 4.62 pci	Outside Container	100	Bγ	10	117	11.7	12.6	NDA	NDA	

WIPE TESTS

<.001 mR at Contact

ATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/100cm²	Bq/100 cm²
-16-84 Kramer	^{125}I 5.25μm	Outside Container	100	β	10	148	14.8	15.1	NDA		
-2-86	^{125}I 3.3μm	Outside Container	100	β	10	122	12.2	12.4	NDA		
-9-86	^{125}I 2.97	" "	"	"	"	140	14.0	13.9	0.1	0.33	5.5×10^{-3}
-8-86	^{125}I 1.32μm	Outside Container	100	β	10	110	11.0	11.8	NDA		
-29-86	^{125}I 3.3μm	Outside Container	100	β	10	142	14.2	14.0	0.2	0.67	1.12×10^{-2}
-6-86	^{125}I < 4.0μm	Outside Container	100	β	10	130	13.0	13.2	NDA		
-20-88	^{125}I 3.3μm	Outside Container	100	β	10	140	14.0	14.1	NDA		
	2.7μm	" "	100	β	10	143	14.3	14.1	0.2	0.67	1.12×10^{-2}
-27-86	^{125}I 4.49μm	Outside Container	100	β	10	140	14.0	12.8	0.2	0.67	1.12×10^{-2}
	2.97μm	" "	100	β	10	136	13.6	13.8	NDA		
-2/86	^{125}I 5.28μm Kramer	Outside Container	100	β	10	132	13.2	13.5	NDA		
2/8/86	^{125}I 8.0μm	Outside Container	100	β	10	146	14.6	14.7	NDA		
/12/86	^{125}I 4.62μm Kramer	Outside Container	100	β	10	139	13.9	13.8	0.1	0.33	5.5×10^{-3}
/31/86	^{125}I 2.04μm	Outside Container	100	β	10	133	13.3	13.5	NDA		
	3.0μm	" "	"	"	"	152	15.2	"	1.7	5.67	9.45×10^{-2}
	2.0μm	" "	"	"	"	139	13.9	"	0.4	1.33	2.22×10^{-2}
	1.0μm	Outside Container	100	β	10	142	14.2	13.5	0.7	2.33	3.88×10^{-2}
/12/87 Kramer	^{125}I 5.28μm	Outside Container	100	β	10	136	13.6	13.7	NDA		

WIPE TESTS

ATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/$100cm^2$	Bq/100 cm^2
-28-86	125I 2.23μci Planar	Outside Container	100	β	10	152	15.2	13.8	1.4	4.67	7.78×10^{-2}
8-30-86	125I 2.23μci Planar	Outside Container	100	β	10	149	14.9	13.4	1.5	5.0	8.33×10^{-2}
-1-86 Planar	125I 2.23μci	Outside Container	100	β	10	141	14.1	14.3	NDA		
-8-86 Planar	125I 7.14μci	Outside Container	100	β	10	130	13.0	12.0	1.0	3.33	5.55×10^{-2}
-9-86 Inal	125I 6.5μci	Outside Container	100	β	10	135	13.5	14.1	N.D.A.		
-12-86 Inal	125I 5.13μci	Outside Container	100	β	10	149	14.9	14.7	0.2	0.67	1.11×10^{-2}
-13-86 Inal	125I 3μci	Outside Container	100	β	10	159	15.9	14.9	1.0	3.33	5.55×10^{-2}
-16-86 eon	125I 4μci	Outside Container	100	β	10	147	14.7	13.2	1.5	5.0	8.33×10^{-2}
-19-86 eon	125I 4μci	Outside Container	100	β	10	135	13.5	13.7	NDA		
-20-86	125I 4.23μci	Outside Container	100	β	10	151	15.1	14.8	0.3	1.0	1.67×10^{-2}
-28-86 Tue	125I 8.6μci	Outside Container	100	β	10	155	15.5	15.6	NDA		
9-86	125I	Outside Container	100	β	10	141	14.6	14.7	NDA		

WIPE TESTS

DATE	WIPE	LOCATION	AREA cm^2	COUNTED FOR	TIME MIN	GROSS COUNTS TOTAL	GROSS COUNTS CPM	BKG	NET CPM	DPM/$100cm^2$	Bq/100 cm^2
7-26-85	^{125}I 1.2μci	Outside Waste Container	100	β	10	159	15.9	16.8	NDA		
[illegible]											
2-2-85	^{125}I 5μci	Outside W. Container	100	β	10	157	15.7	14.7	1.0	3.33	5.55×10^{-2}
[illegible]	" 3μci	" " "	"	β	10	169	16.9	14.7	2.2	7.33	1.22×10^{-1}
2-20-85	^{125}I 7.5μci	Outside W. Container	100	β	10	136	13.3	13.8	N.D.A.		
[illegible]											
1-21-85	^{125}I 1μci	Outside Waste Container	100	β	10	170	17.0	14.0	3.0	10.0	1.67×10^{-1}
[illegible]	2.25μci	" " "	"	β	10	139	13.9	14.0	NDA		
2-23-85	^{125}I 4.8μci	Outside Waste Container	100	β	10	154	15.4	15.2	0.2	0.67	1.11×10^{-2}
[illegible]	" "	" " "	100	β	10	157	15.7	15.2	0.5	1.67	
[illegible]	^{125}I 2.8μci	Outside Waste Container	100	β	10	164	16.4	14.2	2.2	7.33	1.22×10^{-1}
[illegible]	2.8μci	" " "	"	"	"	160	16.0	"	2.0	6.67	1.11×10^{-1}
	1.5μci	Outside Waste Container	100	β	10	143	14.3	14.2	0.1	0.33	5.5×10^{-3}
[illegible]	^{125}I 1.5μci	Outside Waste Container	100	β	10	138	13.8	13.6	0.2	0.67	1.11×10^{-2}
[illegible]	2.0μci	" " "	"	"	"	147	14.7	"	1.1	3.67	6.12×10^{-2}
	1.5μci	" " "	"	"	"	134	13.4	"	NDA		
	2.0μci	Outside Waste Container	100	β	10	158	15.8	13.6	2.2	7.33	1.22×10^{-1}
[illegible]-4-86	^{125}I 2.6μci	Outside Waste Container	100	β	10	144	14.4	13.4	1.0	3.33	5.55×10^{-2}
[illegible]	4.32μci	" " "	"	"	"	128	12.8	13.4	NDA.	NDA.	
[illegible]-8-86	^{125}I 5.32μci	Outside Container	100	β	10	138	13.8	13.6	0.2	0.67	1.11×10^{-2}
[illegible]											
[illegible]-4-86	^{125}I 5.32μci	Outside Container	100	β	10	124	12.4	13.1	NDA	NDA.	
[illegible]-4/6-86	^{125}I 6.6μci	Outside Container	100	β	10	135	13.5	13.4	0.1	0.33	5.5×10^{-3}
[illegible]											

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No. ~~1~~ (9)

te To Barrel	Radionuclide	Form	Amount (mCi) μCi	By
2-6-85	^{3}H	Solid	25+25 = 50μCi	(MS) Dubose
12-10-85	^{3}H	Solid	25μCi	"
12-11-85	^{3}H	Solid	25μCi	"
1-10-86	^{3}H	Solid	25μCi	"
3-7-86	^{3}H	Solid	25μCi	Dubose
3-12-86	^{3}H	Solid	25μCi	"
3-18-86	^{3}H	Solid	25μCi	Dubose
3-17-86	^{14}C	Solid	1+1 = 2μCi	Dunkot
3-19-86	^{3}H	Solid	25+50 = 75μCi	Dubose
3-20-86	^{3}H	Solid	25+25 = 50μCi	Dubose
1-4-86	^{3}H	Solid	25+25+25 = 75μCi	"
7-3-86	^{3}H	Solid	2.6+2.6 = 5.2μCi	Dubose
7-25-86	^{3}H	Solid	2.6μCi	"
8-27-86	^{3}H	Solid	23.9+25 = 48.9μCi	Dubose
10-23-86	^{3}H	Solid	2.4+13.8+3.4 = 19.6μCi	Dubose
2-18-87	^{3}H	Solid	3+22.2+14.9 = 40.1μCi	"
2-19-87	^{3}H	Solid	5.9+1.5 = 7.4μCi	"
4-28-87	^{3}H	Solid	1.0+0.8 = 1.8μCi	"

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No. 3

te To Barrel	Radionuclide	Form	Amount (mCi)	By
22 Apr. 87	^{3}H	Solid	1 μCi	Dubose
28 Apr. 87	^{3}H	"	0.8 μCi	"
3 May 87	^{3}H	"	2.67 μCi	"
15 May 87	^{3}H	"	15.5 μCi	Dubose
July 87	^{3}H	Solid	8.3 μCi	Dubose
[illegible] 87	^{3}H	Solid	<1.10 μCi	Dubose
Aug 87	^{3}H	Solid	<1.6 μCi + <1 μCi	Dubose
Aug 87	^{3}H	Solid	1.3 μCi	Dubose
Sept 87	^{3}H	Solid	141 μCi	Dubose
17 Sept 87	^{3}H	Solid	18.7 μCi	Dubose
8 Sept. 87	^{63}Ni	Solid. Source	15 mCi	[illegible]
Sept 87	^{3}H	Solid Source	200 mCi	[illegible]
Oct 87	^{3}H	Solid	<1 μCi	Dubose
Dec. 87	^{3}H	Solid	<1 μCi	Manager
"	^{14}C	Solid	<1 μCi	Manager
Dec. 87	^{14}C	Solid Source	1.4 mCi	Manager.
Dec. 87	^{252}Cf	Solid Source	3.21×10^{-4} μCi	MARTIN
"	^{60}Co	Solid	<0.001 μCi	"
"	^{14}C	Solid	<0.1 μCi	"
Dec. 87	^{3}H	Solid	<0.2 μCi	Dubose
Dec. 87	^{3}H	Solid	<0.2 μCi	Dubose
[illegible] 87	^{3}H	"	.006	"
[illegible] 87		"	0.2	"
[illegible]	^{3}H	Solid	0.5	Dubose

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No. 3

te To Barrel	Radionuclide	Form	Amount (mCi)	By
9 July 88	^{63}Ni	Solid S. Source	2 mCi	[illegible]
9 July 88	^{133}Ba	Solid S. Source	< 1.5 μCi	[illegible]
6 July 88	^{3}H	Solid	< .21 μCi	Dubose.
May 88 July 88	^{3}H	Solid	0.5 μCi	Dubose.
Aug 88	^{3}H	Solid	< .21 μCi	Dubose
Oct 88	^{3}H	Solid	< 0.142 μCi	Dubose & Lombard.
Nov 88	^{3}H	Solid	< 0.1 μCi	Gymnarmaci
Nov. 88	^{3}H	Solid	< .06 μCi	Dubose.
Dec. 88	^{3}H	Solid	< 0.8 μCi	Dubose.
Dec. 88	^{3}H	Solid	1.5	Durkol
"	^{14}C	Solid	1.7	Durkol
Dec. 88	^{14}C	Solid	10 μCi	Jean Mayer
Mar 89	$^{14}C + ^{3}H$	Solid	< 2 μCi	Siechanski
July "	^{3}H	solid	< .23 μCi	Dubose
Aug "	^{3}H	Solid	< .23 μCi	Dubose
Oct "	^{3}H	Solid	0.4 μCi	Dubose.

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No.

e To Barrel	Radionuclide	Form	Amount (mCi)	By
7	^{3}H	Solid	3.0	JFS
	^{14}C	"	0.3	"
	^{35}S	"	0.04	"
	^{3}H	"	0.02	"
2	^{14}C	Solid	0.2	"
	^{14}C	"	1.0	"
	^{3}H	"	0.5	"
	^{3}H	"	1.1	"
	^{3}H	"	0.2	"
	^{3}H	Solid	0.2	"
5	^{14}C	"	0.4	"
	^{3}H	"	2.0	"
	^{3}H	"	0.5	JFS
4	^{14}C	Solid	0.7	"
	^{3}H	"	0.2	"
	^{3}H	"	3.5	"
	^{3}H	"	8.09	"
	^{3}H	"	3.00	"
	^{35}S	"	0.15	"
	^{35}S	"	1.2	"
	^{3}H	"	1.0	"
	^{14}C	Solid	0.2	"
	^{3}H	"	2.00	"
	^{3}H	"	3.00	JFS

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No.

te To Barrel	Radionuclide	Form	Amount (mCi)	By
	~~3H~~	~~Solid~~	~~900 μci~~	
	~~14C~~	~~Solid~~	~~300 μci~~	
12	14C	"	300 μci	
	3H	"	900 μci	
14	3H	"	300 μci	
	3H	"	8.05 μci	
	14C	"	6.82 μci	
13	14C		750 μci	
	14C	"	.014 μci	
	3H	"	.09 μci	
	3H		.033 μci	
BC	14C	Solid	150 μci	
	14C	"	25 μci	
	14C		~~[illegible]~~ 2.1	
	3H	"	7.7	
16	3H	"	.004 μci	
	14C	"	10 μci	
	3H	"	1.0	
	14C	"	.005 μci	
	14C	"	500 μci	
	14C	"	1.5 mci	
10	14C	Solid	276 μci	
	3H	"	17 μci	

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No.

te To Barrel	Radionuclide	Form	Amount (mCi)	By
11	^{14}C	Solid	280 μci	[illegible]
9	^{14}C	Solid	71 μci	[illegible]
7	^{14}C	Solid	144 μci	[illegible]
6	^{14}C	"	[illegible] μci	[illegible]
8	^{14}C	"	1 μci [illegible]	[illegible]
	^{3}H	"	1 μci [illegible]	[illegible]
	^{3}H	"	113 μci	"
	^{14}C	"	9 μci	"
	^{35}S	"	4 μci	"
	^{14}C	"	4 μci	"
	^{3}H	"	8 μci	"

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No.

te To Barrel	Radionuclide	Form	Amount (mCi)	By
8	^{3}H	Vials	25μci	
	^{3}H	Vials	0.27μci -10.1μci	
9	^{3}H	Solid	25μci -25μci = 50μci ✓	
	^{14}C	Solid	1μci - 1μci = 2μci	
	^{14}C	Solid	25μci ✓	
	^{3}H	Solid	25μci 25μci = 50μci	
	^{3}H	Solid	(25 + 25 - 125 μci = 75μci) one Gag.	
	^{3}H	Solid	25 + 25 = 50μci	
	^{3}H	Solid	0.200μci .006μci	

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No.

e To Barrel	Radionuclide	Form	Amount (mCi)	By
	^{3}H	Solid	250 μci	
	^{35}S	"	100 μci	
152 μci	^{35}S	"	200 μci	
	^{3}H	"	40 μci	
	^{35}S	"	125 μci	
	^{3}H	"	37 μci	
4	^{3}H	"	50 μci	
	^{14}C	"	50 μci	
	^{3}H	"	1.0 μci	
	^{14}C	"	1.0 μci	
	^{3}H	"	800 μci	
	^{14}C	"	300 μci	
	^{14}C	"	31 μci	
	^{14}C	"	25 μci	
	^{14}C		31 μci	
	^{12}C		25 μci	
	^{3}H		900 μci	
	^{3}H		250 μci	
	^{12}C		50 μci	
	^{3}H		50 μci	
	U compounds.		311.1 μci	
	^{14}C		500 μci	
	^{14}C		[illegible] μci	
	^{14}C		[illegible]	

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No.

e To Barrel	Radionuclide	Form	Amount (mCi)	By
16	^{14}C	Solid	400 μci	
	^{3}H	Solid	1.2 mci	
	^{14}C	"	30 μci	
	^{14}C	Solid	100 μci	
	^{3}H	"	4 mci	
	^{14}C	Solid	~~1 mci~~	
	^{3}H	"	~~1 mci~~	
	^{60}Co	Solid	.029 μci = 5.1 μci	
	^{14}C	Solid	250 μci	
	^{3}H	Solid	100 μci	
	^{35}S	Solid	1.001 μci	
	^{14}C	"	200 μci	
	^{14}C	Solid	1 mci	
	^{3}H	"	1 mci	
	^{3}H	Solid	100 μci	
	^{3}H	Solid	25 μci	
	^{3}H	Solid	25 μci	
8.	^{3}H	Vials	25 μci	
	"	"	"	
	"	"	"	
	"	"	"	
	"	"	"	
	^{3}H	Vials	25 μci	
	"	"		

RAD WASTE INVENTORY LOG

Isotope: C-14 Half-Life: 5730 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity	
12/09/87	Unknown	N/A	1400.0 µCi	
12/18/88	Mayer	"	10.0 "	1430 uCi
07/28/91	Dr. Mello	"	10.0 "	
05/12/95	"	"	10.0 "	
04/04/96	Dr. McGrath	"	50.0 "	
11/08/96	Dr. Narayan	"	500.0 "	Two vials 552 uCi
11/08/96	"	"	<1.0 "	Contaminated Plastic barrel (24"dia x30" high)
11/08/96	Arcidiacono	"	<1.0 "	Contaminated Plexiglass storage box, 10" cube

0. C

1,400.00 +
10.00 +
10.00 +
10.00 +
50.00 +
5.00.00 +
1,980.00 *

Gutierrez-Palmenberg, Inc.
2922 W. Clarendon Ave., Phoenix, AZ 85017

Shipment Control #
97-051 / 0263-97

LENGTH	WIDTH	HEIGHT
LEGAL	LEGAL	LEGAL

Tractor 116
Trailer 4008

STRAIGHT BILL OF LADING--ORIGINAL--NOT NEGOTIABLE.
RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading

The property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown). Marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination. If on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination. And as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the uniform domestic straight bill of lading set forth (1) in official, Southern, Western and Illinois Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment. Or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(MAIL OR STREET ADDRESS OF CONSIGNEE-FOR PURPOSES OF NOTIFICATION ONLY.)

FROM : US Army Soldier Sys. Com. Date : 10/01/97
At Natick, MA
CONSIGNED TO: Chem-Nuclear Consolidation Facility
DESTINATION: Barnwell STATE: SC COUNTY: Barnwell
****** **EMERGENCY CONTACT: Gutierrez-Palmenberg, Inc. (602) 739-1885** ******

No. Pkgs.	HM	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, LINER NUMBERS, SPECIAL MARKS & EXCEPTIONS	WEIGHT
1	X	Radioactive Material, n.o.s., 7, UN 2982, Fissile Excepted	210 Lbs
		Chk Sources, static eliminators, vac guages, GCD's, contaminated cement & plexiglass in a metal 55 gallon drum	
		RADIONUCLIDES: Cf252,Ra226,Po210,I129,Bi210,Tl204,Ru106, Ba133,C-14,Co60,Cs137,P32,Ni63,H-3,Unat,Th232 — TOTAL ACTIVITY: 247.468632668805 mCi / 9156.33940874579 MBq	
		CHEMICAL FORM: oxides/elemental — PHYSICAL FORM: solid	
		CONTAINER TYPE: 55 gallon metal drum — CONTAINER SPEC.: USA DOT 7A Type A	
		SPEC. LABELS: Radioactive Yellow-II — MARKINGS: Proper Shipping Name	
		PLACARDING: None — NON-EXCLUSIVE USE	
		TI: 1.0	
3	X	Radioactive Material, Excepted Package - Limited Quantity of Material, 7, UN2910	280 Lbs
		Lab trash : brokenglasswware, paper, plastic, rubber, metal in 55 gallon metal drums	
		RADIONUCLIDES: Ca45, C-14, H-3 — TOTAL ACTIVITY: 4.816774 mCi / 178.220638 MBq	
		CHEMICAL FORM: oxides/elemental — PHYSICAL FORM: solid	
		CONTAINER TYPE: 55 gallon metal drum — CONTAINER SPEC.: Strong Tight Container	
		SPEC. LABELS: none — MARKINGS: Radioactive, Consignee/Consignor Address	
		PLACARDING: None — NON-EXCLUSIVE USE	
		TI: N/A	

IMPORTANT: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.
Signature
Company GPI Date 10/01/97
2922 W. Clarendon Ave.
Phoenix, AZ 85017

Received the property described above in good condition, except as otherwise noted.
Carrier Boyles Transportation
Driver Jerry Leone
Date and time 10/01/97

SCHEDULED TO ARRIVE	DATE 10/01/97	TIME 0800 A.M. P.M.	COMPLETED LOADING	DATE 10/01/97	TIME 0900 A.M. P.M.	SHIPPER'S SIGNATURE
ARRIVED AT SHIPPER	DATE 10/01/97	TIME 0810 A.M. P.M.	LEFT SHIPPER	DATE 10/01/97	TIME 0930 A.M. P.M.	SHIPPER'S SIGNATURE

SHIPPER IMPORTANT NOTE: Your signature certifies tha the above dates and times are correct for record keeping and billing purposes.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
Radioactive Waste Shipment Prior Notification and Manifest Form

(Failure to Complete ALL Entries Will Result in Return of Form and Constitute Noncompliance.)

See Reverse Side for Instructions

1. Name and Address of Shipper/Generator: GPI 2922 W. Clarendon Ave. Phoenix, AZ 85017	2. Person Responsible for Waste Shipment: a) Name: David A. Wise b) Title: Broker c) Telephone: (602) 234-0696
3. Radioactive Waste Transport Permit No. X 3487-02-97	4. Shipment Identification No.: 97-051 / 0263-97
5. Location from which waste will be shipped: HQ, US Army Soldier Sys. Com. Natick, MA	6. Name and Address of Consignee: Chem-Nuclear Consolidation Facility Barnwell, SC 29812
7. Scheduled Date of Departure of Shipment: 10/01/97	8. Estimated Date of Arrival of Shipment: 10/02/97

9. Carrier: Boyles Transportation Bilerica, MA	10. Trailer No. & Owner (if available) 4208 BOYLES	11. Type Transport Vehicle: Closed Transport

12. Routes shipment will follow in State of South Carolina (Be Specific):
I-77 to I-26 to Rt-6 to SC 64 to CNCF

13. Type Package or Cask Model No.: 55 gallon metal drum	14. Type Container in Cask: N/A	15. Package or Cask Spec.: STRONG TIGHT CONTAINER & USA DOT 7A Type A

16. Complete Waste Description (Be Specific): CHECK SOURCES, GCDS, STATIC ELIMINATORS
~~Instruments & Articles~~ ~~Compasses, watches, meters, collimators~~
DAW: GLASS, PAPER ~~guages~~
PLASTIC, RUBBER, CEMENT, METAL

17. Physical & Chemical Form: SOLID Elemental / OXIDE	18. Total No. of Packages: 4 ~~50~~	19. Prominent Radionuclides: Ni 63, C-14, H-3, Cf 252, Ra 226, Po 210, I 129, Bi 210, Tl 204, Ru 106, Ba 133, Co 60, Cs 137, P 32, Unat, Th 232, Ca 45
20. Total Curies: 0.252285406668805 ~~1.5~~	21. Waste Class & Stability: C	22. Total Cubic Feet: 30.0 ~~37.5~~
23. DOT Sub Type: LIMITED QUANTITY, Type A	24. DOT Class. & Hazard Class UN No.: 2982, 2910 Radioactive Material, n.o.s., 7, UN 2982, ~~FISSILE EXCEPTED~~ RADIOACTIVE MATERIAL, ~~NOS~~ EXCEPTED PACKAGE-LIMITED QUANTITY of MATERIAL, 7, UN2910	25. Hwy. Route Controlled: (Large Quantity) [ ] Yes [X] No

CERTIFICATION

I hereby certify on behalf of the above-named shipper/generator to the South Carolina Department of Health and Environmental Control that the information provided herein is complete and correct to the best of my knowledge; and that the shipper/generator has complied with all the provisions as required by Act No. 429 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, and Department Regulation 61-83.

Date: 09/29/97

David A. Wise
Typed Name

Signature of Consignor's Authorized Representative

CONSIGNEE ACKNOWLEDGEMENT

This acknowledges to the South Carolina Department of Health and Environmental Control that the above-described radioactive waste shipment was received.

Date of Delivery

Signature of Consignee's Authorized Representative

Typed or Printed Name and Title

DHEC 802 (Rev. 10/84)

(Copies of this form may be reproduced locally as needed)

Form RHA-CT
(5/80)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
Radioactive Waste Shipment Certification Form

General Instructions and Information: This is a two part form to be used by shippers and carriers of radioactive waste. The certifications contained herein satisfy the requirements of Section 13-7-150, of Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act. This certification along with a copy of the prior notification form shall accompany each shipment of radioactive waste into and within the State of South Carolina. The shipper is to complete his portion of the form and present it to the carrier as part of the shipping documents. Upon receipt, the carrier shall complete his portion of the form. Upon delivery of the shipment to the consignee, a copy of this certification form, and a copy of the Prior Notification and Manifest form with the consignee acknowledgement, shall be returned to the Department.

Part I: Shipper's Certificate of Compliance

1. Name of Shipper and Address: GPI 2922 W. Clarendon Ave. Phoenix, AZ 85017 Telephone No. (602) 234-0696	2. Shipment Identification No. 97-051 / 0263-97 3. Transport Permit No. X 3487-02-97

In compliance with Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, I hereby certify on behalf of the above-named shipper to the South Carolina Department of Health and Environmental Control that the above-named shipper has complied with all provisions of Act No. 499 of 1980, and all applicable laws and administrative rules and regulations, both State and Federal, regarding the packaging, transportation, storage, disposal and delivery of such wastes. I further certify that this shipment of radioactive waste has been inspected within 48 hours of the time of departure and that no items of non-compliance with applicable laws, rules or regulations were found.

Date 10/01/97

David A. Wise / Broker
Typed Name and Title of Agent of Shipper

Signature

Part II: Carrier's Certification

1. Name of Carrier and Address: Boyles Transportation Billerica, MA Telephone No. (800) 343-2004	2. Shipment Identification No. 97-051 / 0263-97 3. Transport Trailer No. 4008
4. Scheduled Date of Departure of Shipment: 10/01/97	5. Estimated Date of Arrival of Shipment: 10/02/97

Certification is hereby made to the South Carolina Department of Health and Environmental Control that: (a) the shipper has provided the carrier with a copy of the shipment manifest, the certificate of compliance, and the routing instructions; (b) the shipment of radioactive waste has been properly placarded for transport according to applicable U.S. Department of Transportation Regulations; (c) all shipping papers originated or reproduced by the carrier have been properly executed; (d) the transport vehicle has been inspected according to applicable State and Federal regulations within the prescribed intervals and that all safety and operational components are in good working order and meet the requirements of regulations; (e) all drivers who will operate the vehicle within the State of South Carolina are qualified to transport hazardous materials as specified by applicable U.S. Department of Transportation regulations; (f) the Department shall be immediately notified of any variance, occuring after departure, from the shipper's notification of primary routes in South Carolina and estimated date of arrival; (g) all applicable laws and administrative rules and regulations, both State and Federal, regarding the transportation of radioactive wastes will be complied with.

Date 10/01/97

Terry Leone
Typed or Printed Name and Title

Signature

DHEC 803
(5/80)

(Copies of this form may be reproduced locally as needed)

LIMITED QUANTITY CERTIFICATION

CONSIGNEE:	CONSIGNOR:
Chem-Nuclear Consolidation Facility Hwy 64 / Near SRS Gate Barnwell, SC 29812	GPI 2922 W. Clarendon Ave. Phoenix, AZ 85017 @ US Army Soldier Sys. Com Natick, MA

Mark the applicable exception statement

☐ **This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package-limited quantity of material, 7, UN2910.**

☐ **This package conforms to the conditions and limitations specified in 49 CFR 173.424 for radioactive material, excepted package-instruments or articles, 7, UN2910.**

☐ **This package conforms to the conditions and limitations specified in 49 CFR 173.426 for radioactive material, excepted articles manufactured from natural or depleted uranium or natural uranium, 7, UN2910.**

☐ **This package conforms to the conditions and limitations specified in 49 CFR 173.428 for radioactive material, excepted empty packaging, 7, UN2910.**

This applies to the following packages: NAT-1, NAT-2, NAT-3

POTENTIAL HAZARDS

HEALTH HAZARDS

Low-level radioactive material; little personal radiation hazard.
Many packages are not required to have radioactive materials labels or markings.
Some radioactive materials cannot be detected by commonly available instruments.

FIRE OR EXPLOSION

Some of these materials may burn, but none of them ignites readily.
Radioactivity does not change flammability or other properties of the materials.

EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.
Response actions may be performed prior to any radiation measurements.
Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.
Notify Radiation Authority of accident conditions.
Detain uninjured persons, isolate equipment with suspected contamination, and delay cleanup until instruction of Radiation Authority.
CALL CHEMTREC AT 1-800-424-9300 FOR EMERGENCY ASSISTANCE.

FIRE

Do not move damaged containers; move undamaged containers out of fire zone.
Small Fires: Dry chemical, CO_2, water spray or regular foam.
Large Fires: Water spray, fog (flooding amounts).

SPILL OR LEAK

Do not touch damaged containers or spilled material.
Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.
Cover powder spill with plastic sheet or tarp to minimize spreading.

FIRST AID

Use first aid treatment according to the nature of the injury.
Advise medical personnel that victim may be contaminated with low-level radioactive material.

This Emergency Response Guide applies to the following Identification Numbers :

☐	UN2910	Radioactive Material, Excepted Package - Articles Manufactured from Natural or Depleted Uranium or Natural Thorium
☐	UN2910	Radioactive Material, Excepted Package - Empty Packaging
☐	UN2910	Radioactive Material, Excepted Package - Instruments or Articles
☒	UN2910	Radioactive Material, Excepted Package - Limited Quantity of Material

POTENTIAL HAZARDS

HEALTH HAZARDS

External radiation hazard from shielded radioactive material.
Internal radiation hazard from inhalation, ingestion or breaks in skin.
Radioactive material; degree of hazard will vary greatly, depending on type and quantity of radioactive material and type of packaging.
Materials in Special Form or in Type B packaging are not expected to cause contamination in accidents.
Some radioactive materials cannot be detected by commonly available instruments.
Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

Some of these materials may burn, but none of them ignites readily.
Radioactivity does not change flammability or other properties of the materials.

EMERGENCY ACTION

Keep unnecessary people at least 150 feet upwind of spill; greater distances may be necessary for people downwind, or if advised by Radiation Authority.
Isolate hazard area and deny entry.
Response actions may be performed prior to any measurement of radiation; limit entry to shortest possible time.
Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.
Notify Radiation Authority of accident conditions.
Detain uninjured persons, isolate equipment with suspected contamination, and delay cleanup until instruction of Radiation Authority.
CALL CHEMTREC AT 1-800-424-9300 FOR EMERGENCY ASSISTANCE.
If water pollution occurs, notify the appropriate authorities.

FIRE

Do not move damaged containers; move undamaged containers out of fire zone.
Small Fires: Dry chemical, CO_2, water spray or regular foam.
Large Fires: Water spray, fog (flooding amounts).
For massive fire in cargo area, use unmanned hose holder or monitor nozzles.

SPILL OR LEAK

Do not touch damaged containers or spilled material.
Damage to outer container may not affect primary inner container.
Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.
Large Spills: Dike far ahead to collect runoff water.

FIRST AID

use first aid treatment according to the nature of the injury.
If not affecting injury, remove and isolate suspected contaminated clothing and shoes; wrap victim in sheet or blanket before transporting.
If there is no injury, remove and isolate suspected contaminated clothing and shoes; assist person to shower with soap and water and notify Radiation Authority of action.
Advise medical personnel that victim may be contaminated with radioactive material.

This Emergency Response Guide applies to the following Identification Numbers :

☐	UN2918	Radioactive Material, Fissile, n.o.s.
☐	UN2974	Radioactive Material, Special Form, n.o.s.
☒	UN2982	Radioactive Material, n.o.s.

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

SHIPMENT NO.: USA 97-051 PAGE NO 1 OF 1

DRUM NO.: NAT-1

CONTAINER SURFACE 0.02 mR/hr 1 METER: 0.02 mR/hr

CONTAINER WEIGHT: 100 Lbs CONTAINER LABELS: Radioactive

CONTAMINTATION: <200 / <1000

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/MBq)	TOTAL ACTIVITY (mCi/MBq)
1	Bag # 9	Broken Glass, paper,plastic	1	H-3	0.01235	0.01235
2	Bag # 10	Broken Glass, paper,plastic	1	C-14	1.98	1.98
3	Bag # 11	Broken Glass, paper,plastic	1	Ca45	2.141	2.141
4	Plastic Barrel		1	C-14	0.001	0.001
5	Piping		1	C-14	0.001	0.001
	"		1	H-3	0.001	0.001
			TOTAL :	H-3	0.01335	
				C-14	1.982	
				Ca45	2.141	
					Grand Total :	4.13635 mCi
						153.0505 MBq

INSTRUMENT TYPE LUDLUM MODEL 19 CALIBRATION DATE: 11/13/97

INSPECTED BY D. WISE LOADED: 9/30/97

As installation Radiation Safety Officer of designee, I certify, based on direct observation or performanc that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous wastes (such as lead) are present.

Signature Date 10/1/97

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

SHIPMENT NO.: USA 97-051 PAGE NO 1 OF 1

DRUM NO.: NAT-2

CONTAINER SURFACE 0.02 mR/hr 1 METER: 0.02 mR/hr

CONTAINER WEIGHT: 90 Lbs CONTAINER LABELS: Radioactive

CONTAMINTATION: <200 / <1000

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/MBq)	TOTAL ACTIVITY (mCi/MBq)
1	Bag # 12	Broken Glass, paper,plastic	1	C-14	0.0112	0.0112
	"		1	H-3	0.0112	0.0112
2	Bag # 6	Broken Glass, paper,plastic	1	H-3	0.041384	0.041384
3	Bag # 7	Broken Glass, paper,plastic	1	H-3	0.0159	0.0159
4	Bag # 8	Broken Glass, paper,plastic	1	H-3	0.05817	0.05817
			TOTAL :	H-3	0.126654	
				C-14	0.0112	
					Grand Total :	0.137854 mCi
						5.100598 MBq

INSTRUMENT TYPE LUDLUM MODEL 19 CALIBRATION DATE: 11/13/97

INSPECTED BY D. WISE LOADED: 9/30/97

As installation Radiation Safety Officer of designee, I certify, based on direct observation or performance that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous wastes (such as lead) are present.

John E Sheehan

Signature

10/1/97

Date

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

SHIPMENT NO.: USA 97-051 PAGE NO 1 OF 1

DRUM NO.: NAT-3

CONTAINER SURFACE 0.02 mR/hr 1 METER: 0.02 mR/hr

CONTAINER WEIGHT: 90 Lbs CONTAINER LABELS: Radioactive

CONTAMINTATION: <200 / <1000

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/MBq)	TOTAL ACTIVITY (mCi/MBq)
1	Bags # 1-5	Broken Glass, paper,plastic	1	H-3	0.54242	0.54242
			TOTAL :	H-3	0.54242	
					Grand Total :	0.54242 mCi
						20.06954 MBq

INSTRUMENT TYPE LUDLUM MODEL 19 CALIBRATION DATE: 11/13/97

INSPECTED BY D. WISE LOADED: 9/30/97

As installation Radiation Safety Officer of designee, I certify, based on direct observation or performanc that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous wastes (such as lead) are present.

[signature]
Signature

10/1/97
Date

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

SHIPMENT NO.: USA 97-051 PAGE NO 1 OF 2

DRUM NO.: NAT-4

CONTAINER SURFACE 24 mR/hr 1 METER: 1.0 mR/hr

CONTAINER WEIGHT: 210 Lbs CONTAINER LABELS: Yellow-II

CONTAMINTATION: <200 / <1000

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/MBq)	TOTAL ACTIVITY (mCi/MBq)
1	Chk Source		1	Cf 252	3.20E-07	3.2E-07
2	Vac Guage	Alphatron Model # 58796	1	Ra 226	0.275	0.275
3	Vac Guage	Alphatron Model # 530	1	Ra 226	0.1	0.1
4	Chk Source		1	Po 210	4.76E-05	4.76E-05
5	Chk Source		1	I 129	1E-06	1E-06
6	Chk Source		1	Bi 210	8.03E-08	8.03E-08
7	Chk Source		1	Tl 204	9.59E-08	9.59E-08
8	Chk Source		1	Ru 106	6.08E-08	6.08E-08
9	Chk Source		1	Ba 133	0.0015	0.0015
10	Chk Source		1	Ba 133	5.00E-04	0.0005
11	Chk Source		1	C-14	2.04E-08	2.04E-08
12	Chk Source		1	C-14	6.97E-06	6.97E-06
13	Chk Source		1	C-14	0.0022	0.0022
14	Chk Source	Tracerlab S/N B-311	1	Co 60	0.00641	0.00641
15	Chk Source		1	Co 60	1.51E-10	1.51E-10
16	Chk Source		1	Co 60	0.0005	0.0005
17	Chk Source		1	Co 60	4.24E-08	4.24E-08
18	Chk Source		1	Co 60	3.82E-10	3.82E-10
19	Chk Source		1	Co 60	4.32E-10	4.32E-10
20	Chk Source		1	Co 60	9.64E-09	9.64E-09
21	Chk Source		1	Cs 137	0.0001	0.0001
22	Chk Source		1	Cs 137	0.0001	0.0001
23	Chk Source		1	Cs 137	0.0001	0.0001
24	Chk Source		1	Cs 137	0.0001	0.0001
25	Chk Source		1	Cs 137	3.42E-08	3.42E-08
26	Chk Source		1	Cs 137	3.42E-08	3.42E-08

INSTRUMENT TYPE LUDLUM MODEL 19 CALIBRATION DATE: 11/13/97

INSPECTED BY D. WISE LOADED: 9/30/97

As installation Radiation Safety Officer of designee, I certify, based on direct observation or performanc that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous wastes (such as lead) are present.

John F. Suchoski
Signature

10/1/97
Date

SHIPPER INVENTORY, INSPECTION AND SURVEY FORM

CONTINUATION SHEET

PAGE NO. 2 OF 2

NO.	NOMEN	STOCK NUMBER	QTY	ISOTOPE	ACTIVITY PER ITEM (mCi/TBq)	TOTAL ACTIVITY (mCi/TBq)
26	Check Source		1	P 32	2.64E-05	2.64E-05
27	ECD	S/N C1924	2	Ni 63	15	30
28	ECD	S/N A755	1	Ni 63	2	2
29	ECD	S/N 18713A	1	Ni 63	15	15
30	Plex Cube		1	C-14	0.001	0.001
31	Static Eliminator	Model # 7777	1	H-3	200	200
32	Plex Cube		1	H-3	0.001	0.001
33	Refer Door		1	H-3	0.001	0.001
34	Cement	Solidified Liquids	1	U nat	0.05	0.05
	"		1	Th 232	0.02904	0.02904
			Totals :	Cf 252	3.2E-07	
				Ra 226	0.375	
				Po 210	4.76E-05	
				I 129	1E-06	
				Bi 210	8.03E-08	
				Tl 204	9.59E-08	
				Ru 106	6.08E-08	
				Ba 133	0.002	
				C-14	0.0032069904	
				Co 60	0.00691005301	
				Cs 137	0.0004000684	
				P 32	2.64E-05	
				Ni 63	47	
				H-3	200.002	
				U nat	0.05	
				Th 232	0.02904	
	Source Mat =				Grand Total :	247.468632668805 mCi
						9156.33940874579 MBq

VEHICLE INSPECTION SHEET

GPI Shipment # USA 97-051 Disposal Shipment # USA 97-051

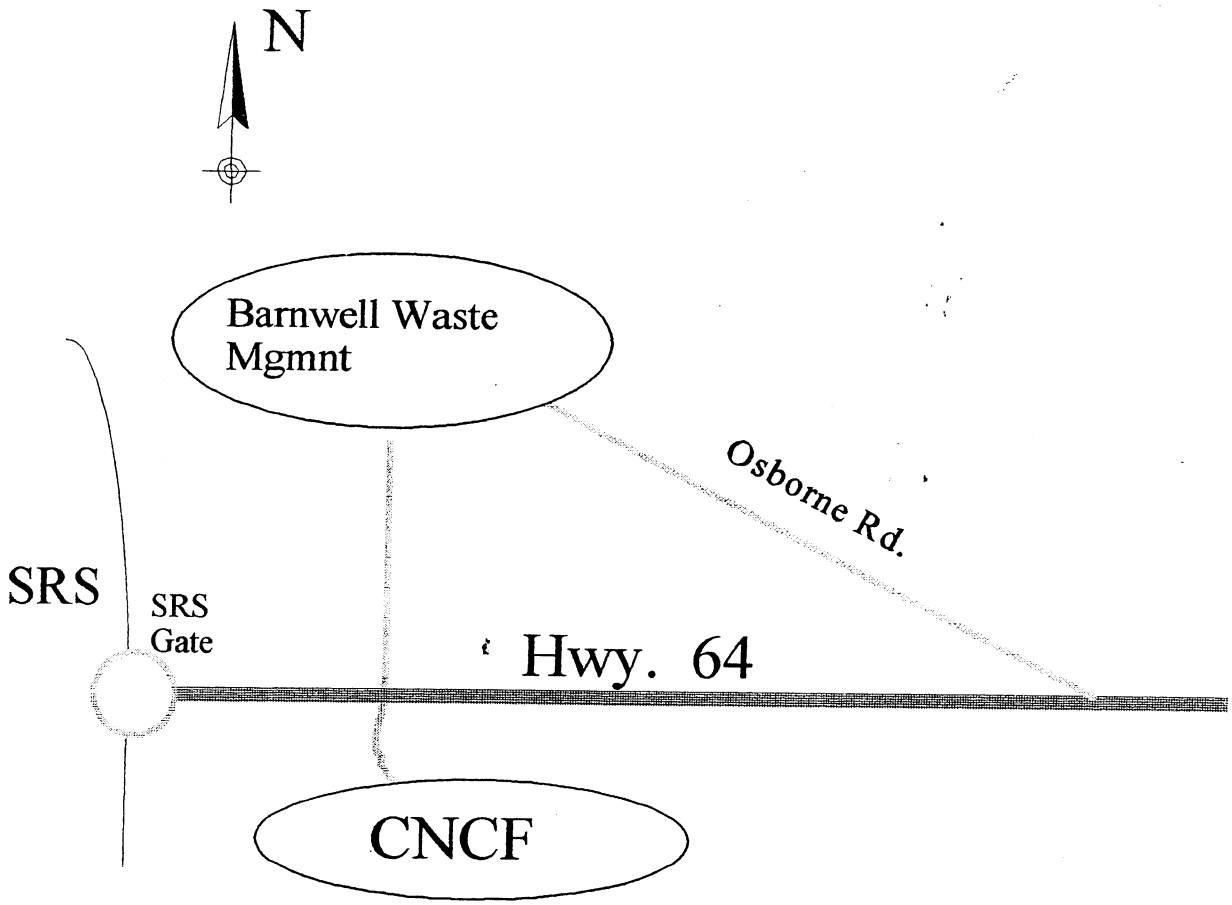
Carrier name/address USDOT Hazmat Reg # Tractor # 116 Trailer # 4008

Boyle Transportation
Billerica MA

Driver's Name: Jerry Leone State: MA License #: 026480210 Exp Date: 5-14-98

1	Operator'sLicense	(X)SAT ( ) UNSAT	Driver possesses valid commercial driver's license (with a tank vehicle /hazardous materials endorsement)
2	Windshield, Side Glass & Mirror	(X)SAT ( ) UNSAT	No cracked or broken glass that would affect the driver's vision. Mirror(s) in place and usable.
3	Wipers	(X)SAT ( ) UNSAT	Wipers operate and are in good condition.
4	Horn	(X)SAT ( ) UNSAT	Air/electric horn works.
5	Suspension	(X)SAT ( ) UNSAT	Visually check for loose, broken, or damaged spring leaves, "U" bolts, shackles, pads, torque arms, and locking pins.
6	Brake Lines	(X)SAT ( ) UNSAT	Brake lines and connectors do not have cracks, crimps, restrictions, or evidence of damage or audible air leaks.
7	Brake Pots & Cams	(X)SAT ( ) UNSAT	Brake pots are in good physical condition and mechanical linkages are intact and in good condition.
8	Exhaust System	(X)SAT ( ) UNSAT	No loose or broken brackets and no evidence of leaks which would affect driving/sleeping compartment.
9	Fuel System	(X)SAT ( ) UNSAT	No damage affecting fuel tank integrity, no visible leaks, no loose or broken mounting brackets, no evidence of damage to vents, and fuel cap is securely in place.
10	Structure&Welds	(X)SAT ( ) UNSAT	No cracks in load bearing welds or assemblies.
11	Frame	(X)SAT ( ) UNSAT	No cracked, loose, sagging, or broken frame.
12	Van/Trailer Floor	(X)SAT ( ) UNSAT	No holes or projecting nails. Capable of bearing weight of load and fork truck (if used).
13	Van walls, ceiling	(X)SAT ( ) UNSAT	No holes, severe dents, or buckling.
14	Van doors	(X)SAT ( ) UNSAT	Can be closed and secured properly.
15.	Rims	(X)SAT ( ) UNSAT	Rims are not bent or cracked, and stud nuts are in place.
16	Tires	(X)SAT ( ) UNSAT	Tires appear properly inflated, tread depths appear greater than minimum (major tread depth at least 1/8" on front and 1/16" on all others) and show no evidence of cuts or damage affecting the plycord.
17	Hubs	(X)SAT ( ) UNSAT	Oil level visible, no visible oil leakage from seals.
18	Head lights	(X)SAT ( ) UNSAT	Both low beams working.
19	Running Lights	(X)SAT ( ) UNSAT	All affixed running lights operable.
20	Turn Signals	(X)SAT ( ) UNSAT	Front and back working.
21	Brake Lights	(X)SAT ( ) UNSAT	Must work on tractor and trailer.
22	Bracing	(X)SAT ( ) UNSAT	Bracing/shoring must be sufficient to prevent shifting of lading during conditions normally incident to transportation.

Tractor & Trailer (X) are ( ) are not acceptable for use.


N
Barnwell Waste
Mgmnt
Osborne Rd.
SRS
SRS
Gate
Hwy. 64
CNCF

FORM 541

CHEM-NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and Disposal of Radioactive Waste

1. MANIFEST TOTALS

# OF PKGS/	NET WASTE VOLUME	NET WASTE WEIGHT
4	m3 0.178 ~~0.732~~	113.64
	ft3 26	250

SPECIAL NUCLEAR MATERIAL (grams)

U-233	U-235	Pu	TOTAL
NP	NP	NP	NP

ACTIVITY (MBq/mCi)

	ALL NUCLIDES	TRITIUM	C-14	Tc-99	I-129	SOURCE
MBq	~~9274.5600467456~~ 7337.554496747	7425.323688	73.86705864	NP	1E-06	kg 0.334423
mCi	~~252.285406668885~~ 232.285256668881	200.684424	1.9964069904			lb 0.737

2. MANIFEST NUMBER: SCN 0263-97

3. PAGE 1 OF 2 PAGE(S)

4. SHIPPER NAME: GPI

SHIPMENT ID NUMBER: SCN 0263-97

DISPOSAL CONTAINER DESCRIPTION / WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER

5. CONTAINER IDENTIFICATION NUMBER/ S.C.TRANSPORT PERMIT NUMBER	6. CONTAINER DESCRIPTION (See Note 1 & Note 1A)	7. VOLUME m3 / ft3	8. WASTE AND CONTAINER WEIGHT kg / lb	9. SURFACE RADIATION LEVEL mSv/hr / mrem/hr	10. SURFACE CONTAMINATION MBq/100 cm2 / dpm/100 cm2 ALPHA	BETA-GAMMA	11. WASTE DESCRIPTOR (See Note 2 & Note 2A)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER m3 / ft3	13. SOLIDIFICATION OR STABILIZATION MEDIA (Note 3 &3A)	14. CHEMICAL DESCRIPTION: CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF>0.1%	15. RADIOLOGICAL DESCRIPTION: INDIVIDUAL RADIONUCLIDES AND ACTIVITY AND CONTAINER TOTAL; OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT: RADIONUCLIDES	MBq	mCi	16 WASTE CLASS (AS-CLASS A, STABLE ALL A UNSTABLE B-CLASS B, C-CLASS C)
Nat-1 0137-00-97E	4	0.21 / 7.5	45.45 / 100	0.0002 / 0.02	< 2e-4 / < 200	< 1e-3 / < 1000	35 / 39 H	0.21 / 7.5	100	OXIDE / NP	NP	Ca 45 C-14 H-3 Total :	79.217 73.334 0.49395 153.04495	2.141 1.982 0.01335 4.13635	AU
Nat-2 0137-00-97E		0.21 / 7.5	40.91 / 90	0.0002 / 0.02	< 2e-4 / < 200	< 1e-3 / < 1000	35/39 H	0.21 / 7.5	100	OXIDE / NP	NP	C-14 H-3 Total :	0.4144 4.686198 5.100598	0.0112 0.126654 0.137854	AU
Nat-3 0137-00-97E	2	0.21 / 7.5	40.91 / 90	0.0002 / 0.02	< 2e-4 / < 200	< 1e-3 / < 1000	35 / 39 H	0.21 / 7.5	100	Oxide / NP	NP	H-3 Total :	20.06954 20.06954	0.54242 0.54242	AU

NOTE 1: Container Description codes. For containers/ waste requiring disposal in approved structural overpks the numerical code must be followed by "-OP."

1. Wooden Box
2. Metal Box
3. Plastic Drum
4. Metal Drum
5. Metal tank or liner
6. Concret tank or liner
7. Polyethylene tank or liner
8. Fiberglass Tank or Liner
9. Demineralizer
10. Gas Cylinder
11. Bulk, Unpackaged waste
12. Unpackaged Components
13. High Integrity Container
19. Other describe in 6

NOTE 1A: Barnwell Specific Container Description Codes. (Choose one code as may be applicable.)

A High Integrity Container-Poly
B High Integrity Container-Poly w/ Steel Shell
C High Integrity Drum Overpack- Poly
D High Integrity Container-Stainless Steel
E High Integrity Container-Fiberglass
F Liner-Steel

Note 2: Waste Descriptor Codes. (Choose up to three which predominate by volume.)

20. Charcoal
21. Incinerator Ash
22. Soil
23. Gas
24. Oil
25. Aqueous Liquid
26. Filter Media
27. Mechanical Filter
28. EPA or State Hazardous
29. Demolition Rubble
30. Cation Ion-exchange Media
31. Anion Ion-exchange Media
32. Mixed Bed Ion-exchange Media
33. Contaminated Equipment
34. Organic Liquid (except oil)
35. Glassware or Labware
36. Sealed Source/Device
37. Paint or Plating
38. Evaporator Bottoms/Sludges/Concentrates
39. Compactible Trash
40. Noncompactible Trash
41. Animal Carcass
42. Biological Material (except animal carcass)
43. Activated Material
59. Other, Describe in Item 11, or additional page

Note 2A: Barnwell Specific Waste Descriptor Codes (Choose all applicable codes.)

G Dewatered
H Solid
I Combustible
J Non-combustible
K Air Filtration Filters
L Asbestos

Note 3: Solidification and Stabilization Media Codes

For media meeting disposal site structural stability requirements, the numerical code must be followed by "s"

For all solidification media the vendor and brand name must also be identified in Item 13. Code 100=none req.

Solidification

90. cement
91. concrete (encapsulation)
92. Bitumen
93. Vinyl Chloride
94. Vinyl Ester Styrene
99. Other, Describe in Item 13, or additional page
100. None Required

Note 3A: Barnwell Specific Solidification and Stabilization Media Codes. (Choose this code if applies)

M Wax Binder

FORM 541

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

CHEM-NUCLEAR CONSOLIDATION FACILITY

2. MANIFEST NUMBER: SCN 0263-97

3. PAGE_2_OF_2_PAGE(S)

DISPOSAL CONTAINER DESCRIPTION / WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER

5. CONTAINER IDENTIFICATION NUMBER/ S.C.TRANSPORT PERMIT NUMBER	6. CONTAINER DESCRIPTION (See Note 1 & Note 1A)	7. VOLUME m3 / ft3	8. WASTE AND CONTAINER WEIGHT kg / lb	9. SURFACE RADIATION LEVEL mSv/hr / mrem/hr	10. SURFACE CONTAMINATION MBQ/100 cm2 / dpm/100 cm2 ALPHA	BETA-GAMMA	11. WASTE DESCRIPTOR (See Note 2 & Note 2A)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER m3 / ft3	13. SOLIDIFICATION OR STABILIZATION MEDIA (Note 3 &3A)	14. CHEMICAL DESCRIPTION: CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF>0.1%	15. RADIOLOGICAL DESCRIPTION: INDIVIDUAL RADIONUCLIDES AND ACTIVITY AND CONTAINER TOTAL; OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT: RADIONUCLIDES	MBq	mCi	16 WASTE CLASS A-S-CLASS A STABLE AU-A UNSTABLE B-CLASS B C-CLASS C
Nat-4 0137-00-97E	4	0.21 ====== 7.5	95.45 ======= 210	0.24 ======= 24	< 2e-4 ======= < 200	< 1e-3 ====== < 1000	36H	0.014 ========== 0.5	100	Oxides/ NP	NP	Cf 252	1.184E-05	3.2E-07	C
		======	=======	=======	=======	======		==========				Ra 226	13.875	0.375	
		======	=======	=======	=======	======		==========				Po 210	0.0017612	4.76E-05	
		======	=======	=======	=======	======		==========				I 129	3.7E-05	1E-06	
		======	=======	=======	=======	======		==========				Bi 210	2.971E-06	8.03E-08	
		======	=======	=======	=======	======		==========				Tl 204	3.548E-06	9.59E-08	
		======	=======	=======	=======	======		==========				Ru 106	2.25E-06	6.08E-08	
		======	=======	=======	=======	======		==========				Ba 133	0.074	0.002	
		======	=======	=======	=======	======		==========				C-14	0.08165864	0.0022069904	
		======	=======	=======	=======	======		==========				Co 60	0.25567196	0.00691005301	
		======	=======	=======	=======	======		==========				Cs 137	0.01480253	0.0004000684	
		======	=======	=======	=======	======		==========				P 32	0.0009768	2.64E-05	
		======	=======	=======	=======	======		==========				Ni 63	1739	47	
		======	=======	=======	=======	======		==========				H-3	7400	200	
		======	=======	=======	=======	======	39H	0.028 ========== 1	100	Oxides / NP	NP	Total :	9153.30392874597	247.38659266881	
		======	=======	=======	=======	======	SOLIDIFIED LIQUIDS 59H	0.056 ========== 2	90	Oxides / NP	NP	H-3	0.074	0.002	AU
												C-14	0.037	0.001	
												Total :	0.111	0.003	
												Th 232	1.07448	0.02904	AU
												U nat	1.85	0.05	
												Total :	2.92448	0.07904	
		======	=======	=======	=======	======		==========				SOURCE MAT = 334.423 g 0.737 Lb			
		======	=======	=======	=======	======		==========							
		======	=======	=======	=======	======		==========							
		======	=======	=======	=======	======		==========							
		======	=======	=======	=======	======		==========							

FORM 540 CHEM-NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST (SHIPPING PAPER)

5. Shipper-Name and Facility
GPI
2922 W. Clarendon Ave
Phoenix, AZ 85017

SHIPMENT ID NUMBER: SCN 0263-97

X	COLLECTOR
	PROCESSOR
	GENERATOR
	TYPE (SPECIFY)

7. FORM 540 & 540A — PAGE 1 OF 1 PAGE(S)
FORM 541 & 541A — 2 ~~1~~ PAGE(S)
FORM 542 & 542A — 1 PAGE(S)
ADDITIONAL INFORMATION — PAGE(S)

8. MANIFEST NUMBER (Use this number on all continuation pages): SCN-0263-97

1. EMERGENCY TELEPHONE NUMBER (INCLUDE AREA CODE): (602) 739-1885

S.C. TRANSPORT PERMIT #: X 3487-02-97
SHIPMENT NUMBER: USA 97-051

ORGINIZATION: Gutierrez-Palmenberg, Inc.

CONTACT: Mr. Walter Cunningham
TELEPHONE NUMBER: (602) 234-0696

9. CONSIGNEE- Name and Facility Address
CHEM-NUCLEAR SYSTEMS, INC. CNCF
HWY 64 (1 MILE WEST OF SNELLING)
BARNWELL,SC 29812

CONTACT: INVENTORY CONTROL
TELEPHONE NUMBER (Include Area Code): 803/259-1119

2. "EXCLUSIVE USE" SHIPMENT? [ ] YES [X] NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST: 4

6. CARRIER-Name and Address
Boyles Transportation
15 Riverhurst Rd.
Billerca, MA

EPA I.D. NUMBER: N/A

SIGNATURE-Authorized consignee acknowledging waste receipt

DATE

4. Does EPA Regulated waste requiring a manifest accompany this shipment? [ ] YES [X] NO
IF "Yes," manifest number-->

EPA MANIFEST NUMBER: N/A

CONTACT: Rick Araniz
TELEPHONE NUMBER: (800) 343-2004

SHIPPING DATE: 10/01/97

SIGNATURE-Authorized carrier acknowledging waste receipt: Perry Jeane

DATE: 10/01/97

10. CERTIFICATION — This is to certify that the herein-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. This also certifies that the materials are classified, packaged, marked and labeled and are in proper condition for transportation and disposal as described in accordance with the requirements of 10 CFR Parts 20 and 61, or equivalent state regulations.

AUTHORIZED SIGNATURE

TITLE: Broker

DATE: 10/01/97

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information)	12 DOT LABEL RADIOACTIVE"	13 TRANSPORT INDEX	14 PHYSICAL AND CHEMICAL FORM	15 INDIVIDUAL RADIONUCLIDES	16 TOTAL PACKAGE ACTIVITY MBq	mCi	17 LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (USE APPROPRIATE UNITS)	19 IDENTIFICATION NUMBER OF PACKAGE
RADIOACTIVE MATERIAL,n.o.s.,7,UN2982 Fissile Excepted (chk sources, GCD's, guages, solidified liquids, plexiglass)	Yellow-II	1	SOLID, OXIDES, Elemental	Cf252,Ra226,Po210,I129,Bi210,Tl204, Ru106,Ba133,C-14,Co60,Cs137,P32 Ni63,H-3,Unat,Th232	9156.33940874579	247.468632668805	N/A	7.5 ft3	Nat-4
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-LIMITED QUANTITY of MATERIAL, 7, UN 2910 (contaminated glass, paper, plastic, rubber, metal)	Radioactive	0.1	SOLID, Oxides Elemental	Ca 45, C-14, H-3	153.0505	4.1365	N/A	7.5 ft3	Nat-1
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-LIMITED QUANTITY of MATERIAL, 7, UN 2910 (contaminated glass, paper, plastic, rubber, metal)	Radioactive	0.1	SOLID, Oxides Elemental	C-14, H-3	5.100598	0.137854	N/A	7.5 ft3	Nat-2
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-LIMITED QUANTITY of MATERIAL, 7, UN 2910 (contaminated glass, paper, plastic, rubber, metal)	Radioactive	0.1	SOLID, Oxides Elemental	H-3	20.06954	0.54242	N/A	7.5 ft3	Nat-3

FOR CONSIGNEE USE ONLY

20. "Certification is hereby made to the South Carolina Department of Health and Environmental Control that this shipment of low-level radioactive waste has been inspected in accordance with the requirements of South Carolina Radioactive Material License 287-04 as amended, and the effective consolidation facility acceptance criteria, within 48 hours prior to shipment, and further certification is made that the inspection revealed no items of non-compliance with all applicable laws, rules and regulations."

Date: 10/01/97 ~~09/17/97~~ Signature

Title and Orginization: Broker / GPI

Telephone No. (602) 234-0696

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Ni - 63

2.2 Activity: (a) _____ Curies (b) 15 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/_____ (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: Hewlett Packard

4.2 Model Number: 5840A

4.3 Serial Number: 2107A08582

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☒ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) [X] Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) [ ] Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) [ ] Not Needed (c) [ ] Other (Describe) _____

(b) [ ] Damaged _____

LICENSE #: 20-00315-02

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) ☐ Continue storage for future use (b) ☐ Transfer to other licensee (c) ☐ Send for disposal (d) ☐ Transfer to Manufacturer (e) ☐ Problems with disposal. (Explain in number 8.0) (f) ☐ Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) ☒ NO - Go to 6.0 (b) ☐ YES - How many? (c) _____ (Continue)
2.0	INFORMATION ABOUT THE SOURCE
2.1	Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0	SOURCE DESCRIPTION	4.0	DEVICE DESCRIPTION
3.1	Manufacturer: _____	4.1	Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

Record of Sealed Source Leak Tests

Radionuclide: 63 Ni Activity: 15 mCi Date: 12/23/87

Source Location:

H.P. M.No = 5840A
ECD S.N = C1924

Diagram of Description of Source:

Located in Hewlett Gas Chromatograph

Radiation Measurements (in use - in storage):

Source disassembled from instrument

Description of Test:

Wipe OF Source Area

wet wipe

Counting Results (uc):

60.6 CPM
52.1 CPM Bhrd
8.5 CPM

4.91 DPM = 2.48×10^{-1} Bq

Date: 6/18/97 Tested By: J.F. Seachoak

Date: 6/18/97 Counted By: J.F. Seachoak

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Ni - 63

2.2 Activity: (a) _____ Curies (b) 2 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/_____ (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: Hewlett Packard

4.2 Model Number: 5754B

4.3 Serial Number: 746B01161

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☒ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) ☐ Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) ☒ Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) ☐ Not Needed (c) ☒ Other (Describe) Removed from GC which was obsolete.

(b) ☐ Damaged

LICENSE #: 20-00315-02

NRC SSD Survey (OMB Approved 3150-0152) 1/91

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) [ ] Continue storage for future use (b) [ ] Transfer to other licensee (c) [X] Send for disposal (d) [ ] Transfer to Manufacturer (e) [ ] Problems with disposal. (Explain in number 8.0) (f) [ ] Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) [X] NO - Go to 6.0 (b) [ ] YES - How many? (c) _____ (Continue)
2.0	INFORMATION ABOUT THE SOURCE
2.1	Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0	SOURCE DESCRIPTION	4.0	DEVICE DESCRIPTION
3.1	Manufacturer: _____	4.1	Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

Record of Sealed Source Leak Tests

Radionuclide: ^{63}Ni Activity: 2 mCi Date: 12/21/83

Source Location:

HP M.No. = 5750
ECD S.No = A755

Diagram of Description of Source:

Located in Hewlett Packard Gas Chromatograph

Radiation Measurements (in use - in storage):

Source disassembled from instrument

Description of Test:

wipe of Source Area Housing
wet wipe

Counting Results (uc):

80.7 CPM
52.1 CPM Bkgd
28.6 CPM

0.18 DPM → 8.36×10^{-1} Bq

Date: 6/18/97 Tested By: J.F. Seechasha

Date: 6/18/97 Counted By: J.F. Seechasha

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Ni - 63

2.2 Activity: (a) _____ Curies (b) 15 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/_____ (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: Bendix Corporation

4.2 Model Number: 25621R

4.3 Serial Number: 100129

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☒ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) ☐ Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) ☒ Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) ☐ Not Needed (c) ☒ Other (Describe) Removed from GC which was obsolete.

(b) ☐ Damaged

LICENSE #: 20-00315-02

NRC SSD Survey (OMB Approved 3150-0152) 1/91

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) [ ] Continue storage for future use (b) [ ] Transfer to other licensee (c) [x] Send for disposal (d) [ ] Transfer to Manufacturer (e) [ ] Problems with disposal. (Explain in number 8.0) (f) [ ] Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) [X] NO - Go to 6.0 (b) [ ] YES - How many? (c) _____ (Continue)
2.0 2.1	INFORMATION ABOUT THE SOURCE Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0 3.1	SOURCE DESCRIPTION Manufacturer: _____	4.0 4.1	DEVICE DESCRIPTION Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

Record of Sealed Source Leak Tests

Radionuclide: ^{63}Ni Activity: 15mCi Date:

Source Location:

Bendex MN=2562
ECD-S No=18713A

Diagram of Description of Source:

Located In Bendix Gas Chromatograph

Radiation Measurements (in use - in storage):

Source Disasembled From Instrument

Description of Test:

Wipe OF Source Housing Area

Wet wipe

Counting Results (uc):

1645.6 CPM
52.1 CPM Bkgd
1593.5 CPM

1795.6 D.P.M. = 46.59 Bq

Date: 6/18/97 Tested By: J.F. Seichaski

Date: 6/18/97 Counted By: J.F. Seichaski

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number H - 3

2.2 Activity: (a) _____ Curies (b) 200 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: _____/___/1967 (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: _____

3.2 Model Number: _____

3.3 Serial Number: _____

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: B.K. Sweeney Company

4.2 Model Number: _____

4.3 Serial Number: _____

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☐ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☒ Other (Describe): Static Electricity Eliminator

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) ☐ Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) ☒ Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) ☐ Not Needed (c) ☒ Other (Describe) Removed from Static Eliminator which was obsolete.

(b) ☐ Damaged

LICENSE #: 20-00315-02

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status)
	(a) [ ] Continue storage for future use (b) [ ] Transfer to other licensee
	(c) [x] Send for disposal (d) [ ] Transfer to Manufacturer
	(e) [ ] Problems with disposal. (Explain in number 8.0)
	(f) [ ] Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed)
	(Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type.
	(a) [X] NO - Go to 6.0 (b) [ ] YES - How many? (c) _____ (Continue)
2.0	INFORMATION ABOUT THE SOURCE
2.1	Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries
	(c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0	SOURCE DESCRIPTION	4.0	DEVICE DESCRIPTION
3.1	Manufacturer: _____	4.1	Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION.
	(a) Form completed by: Paul G. Angelis - Radiation Protection Officer
	(b) Date: 5 September 1991

LICENSE #: 20-00315-02

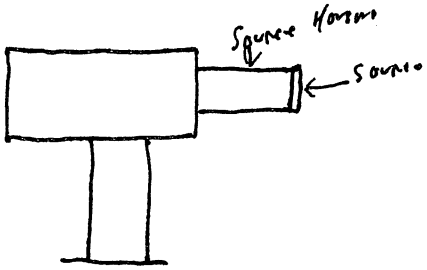
Record of Sealed Source Leak Tests

Radionuclide: ^3H Activity: 200 mCi Date: Aug. 1967

Source Location:

MFG. B.K. Sweeney, Mfg. Co
Denver Col
Model # 7777

Diagram of Description of Source:



Radiation Measurements (in use - in storage):

Description of Test:

wipe OF Housing Source
" " Source Face (Front)
wet wipes

Counting Results (uc):

Housing Area 92.5 CPM
25.9 CPM Bkgd
66.6 CPM

5136 DPM = 2.52 Bq

Face Area 44.5 CPM
25.9 CPM Bkgd
18.6 CPM

2027 DPM = 7.04×10^{-1} Bq

Date: 6/18/97 Tested By: [signature]

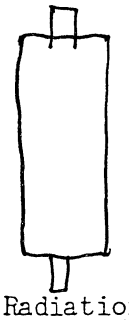
Date: 6/18/97 Counted By: [signature]

Record of Sealed Source Leak Tests

Radionuclide: ^{226}Ra Activity: 375 micrograms Date: 6/27/97

Source Location:
Waste Drum

Diagram of Description of Source:



Radiation Measurements (in use - in storage):

Description of Test:
Wipe of Source Area (Housing)

Counting Results (uc):
0.25 CPM
0.1 CPM Bkgd
0.15 C.P.M

0.363 DPM = 6.05×10^{-3} Bq. / 100cm²

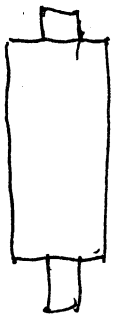
Date: 6/23/97 Tested By: [signature]
Date: 6/23/97 Counted By: [signature]

Record of Sealed Source Leak Tests

Radionuclide: ^{226}Ra Activity: 100 μ grams Date: 6/23/97

Source Location:
Waste Drum

Diagram of Description of Source:



Radiation Measurements (in use - in storage):

Description of Test:
Wipe of Housing Area (Source)

Counting Results (uc):

0.25 CPM
0.1 CPM Bkgd
0.15 C.P.M

0.363 DPM = 6.05×10^{-3} Bq/100 cm²

Date: 6/23/97 Tested By: [signature]

Date: 6/23/97 Counted By: [signature]

Record of Sealed Source Leak Tests

Radionuclide: ^{63}Ni Activity: 15 mCi Date: 6/26/93

Source Location:

Perkin Elmer.
M.No = Sigma 3B
Decal No = 26009

Diagram of Description of Source:

Perkin Elmer Gas Chromatograph

Radiation Measurements (in use - in storage):

Source disassembled from Instrument

Description of Test:

Wipe of Source Housing Area
wet wipe

Counting Results (uc):

69.7 CPM
52.1 CPM Bkgd
17.6 CPM

30.88 DPM = 5.15×10^{-1} Bq.

Date: 6/18/97 Tested By: J. F. Lechanche

Date: 6/18/97 Counted By: J. F. Lechanche

Perkin Elmer Sigma 3 Bar Code 26009
Research Bldg Room 220

9D. RADIOACTIVE MATERIALS

The Electron Capture Detector incorporates a radioactive source. Users of this detector are required to familiarize themselves with the current regulations governing the use of radioactive materials in their particular country, and should ensure that their procedures comply with the requirements of those regulations. For registration purposes, a source serial number is stamped on the outside of the ECD cell housing. In the U.S., owners of the ECD must be licensed by the U.S. Nuclear Regulatory Commission (NRC) and/or, in some states, by the equivalent state agency. For further information, contact the Customer Service Department at the Perkin-Elmer Corp., Norwalk, Connecticut, or the NRC Material Branch, Office of Nuclear Materials, Safety and Safeguards, Washington, D.C. 20555. Specify Perkin-Elmer Electron Capture Detector, Part No. 330-0119. The owner should indicate on his license application that he intends to perform periodic wipe-tests on the detector in accordance with NRC requirements (refer to Section 10).

In the U.K., registration is required under the Radioactive Substances Act 1960, for anyone keeping or using radioactive materials. Application should be made to one of the following governing bodies:

ENGLAND -	Department of the Environment Queen Anne's Chambers Tothill Street London, SW1H 9J4
SCOTLAND -	Scottish Development Department 21 Hill Street Edinburgh, EH2 3J4
WALES -	Welsh Office Cathay's Park Cardiff, CF1 3NG
NORTHERN IRELAND -	Ministry of Development Parliament Building Stormont Belfast, Northern Ireland

When the equipment is used in research or teaching establishments, the user's attention is especially directed to the 'Code of Practice for the protection of persons exposed to ionizing radiations in Research and Teaching'. Further advice may be obtained from:

Department of Productivity Advisory and Information Unit
Baynard's House
1 - 13 Chepstow Place
Westbourne Grove
London, W2

9E. HEATED ZONES

Heated zones should be treated with caution. Avoid physical contact with the injector caps if heated injectors are installed. The grille on the detector cover may also get hot, especially if flame detectors are operated at high temperatures (in excess of 300°C). As a general rule, allow heated zones to cool before attempting to touch the injector or detector areas.

E) ECD Cleaning and Maintenance Procedure

1) Bake-Out Procedure

It is often possible to decontaminate the ECD by purging it with carrier gas using a flow rate of 50 to 100 cm^3/min. and raising the temperature to 400°C. These conditions should then be maintained until the detector is clean. Periodically, plot a graph of standing current setting versus frequency, as described in the Practical Gas Chromatography Manual. The plot should improve as cleaning progresses, but complete cleaning may require baking for several hours or even days, depending on the type and extent of contamination.

Important: Never attempt to flush the detector cell assembly with acidic solvents, as this will result in the removal of radioactive material from the cell.

2) Wipe Test

The United States Nuclear Regulatory Commission requires that the detector be wipe tested at least once every six months, and that a record of the results of these tests be maintained for NRC inspection. The purpose of the wipe test is to ensure that removable radioactive contamination on the external parts of the cell remains at a safe level.

Important: Until the results of the wipe test are known, assume that the cell is contaminated and handle it only with suitable protection. All equipment coming into contact with the cell should be considered contaminated and handled accordingly.

It is strongly recommended that the user become familiar with the NRC regulations covering the use of nickel-63, as well as any other national, state or local requirements.

Note: The NRC wipe test is not required in the U.K.

Perform the wipe test as follows:

1) Switch the instrument off and allow the detector to cool.

2) Expose the detector by pulling the detector cover forward and downward. The cover may be detached completely if required.

3) Pull off the collector housing (Figure 10-5).

Warning: DO NOT DISMANTLE THE CELL.

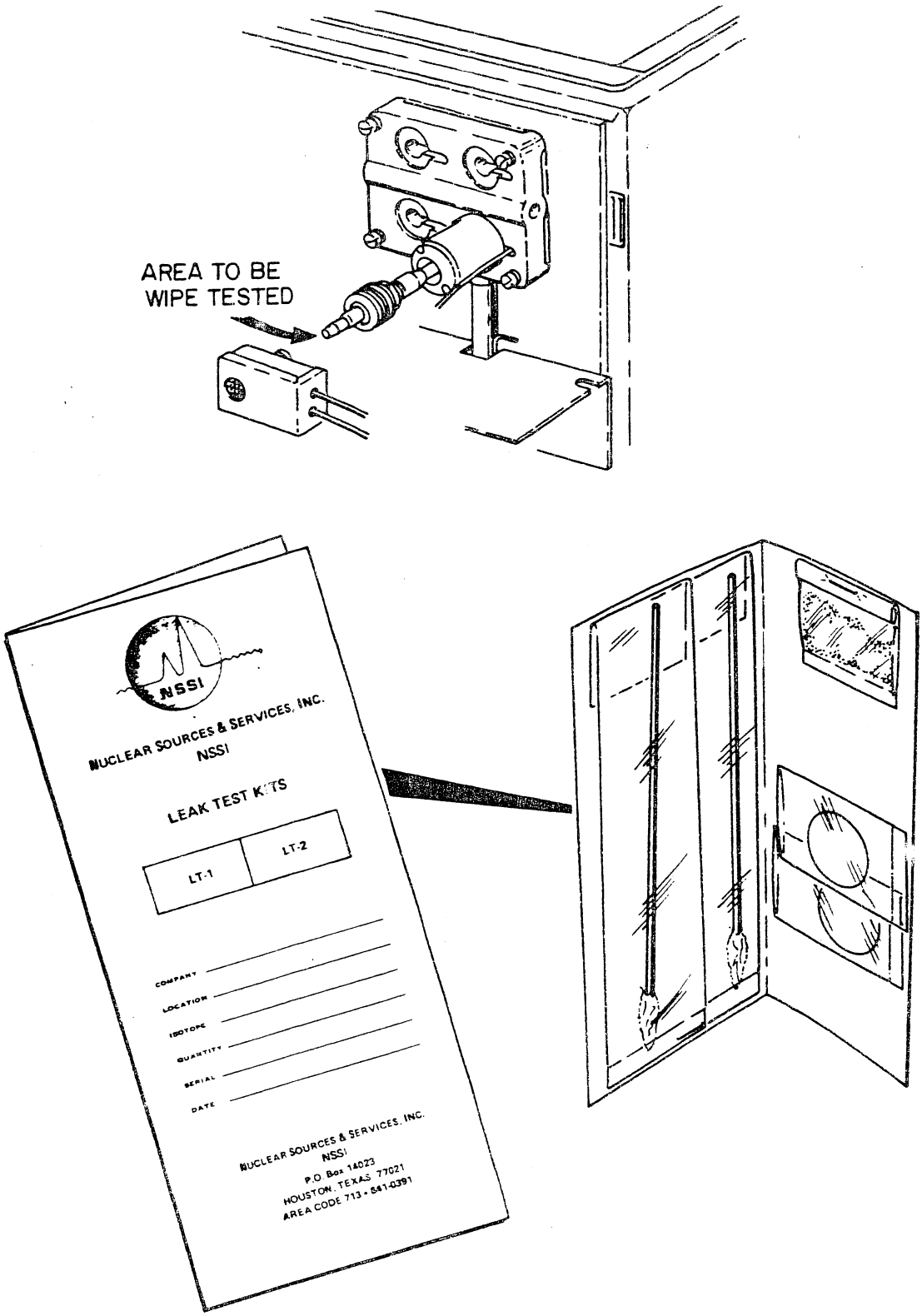


Figure 10-5 - The ECD Wipe Test

Gutierrez - Palmenberg, Inc.

David A. Wise, CHMM
Project Manager
Waste Mgmnt. & Remedial Services

2922 W. Clarendon Ave.
Phoenix, AZ 85017

E-Mail: david.w@gpimail.com
Fax: (602) 234-0699
Phone: (602) 234-0696

FORM 542

CHEM-NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

MANIFEST INDEX AND REGIONAL COMPACT TABULATION

1. WASTE COLLECTOR/PROCESSOR

NAME Gutierrez-Palmenberg, Inc. (GPI)

S.C. RADIOACTIVE WASTE TRANSPORT PERMIT NUMBER X 3487-02-97

SHIPPING DATE 10/01/97

SHIPPER USE ONLY

2. MANIFEST NUMBER SCN 0263-97

3. PAGE_1_OF_1_PAGE(S)

4. SC TRANSPORT PERMIT #	5. GENERATOR NAME AND TELEPHONE NUMBER	6. GENERATOR FACILITY ADDRESS	6A. WASTE DESCRIPTION (NOMENCLATURE)	7. PREPROCESSED WASTE (OR MATERIAL) VOLUME (m3)	(ft3)	8. MANIFEST NUMBER(S) UNDER WHICH WASTE (OR) MATERIAL REC. & DOR.	9. WASTE CODE P=PROCESSED C=COLLECTED	10. ORIGINATING COMPACT OR STATE	11. AS PROCESSED/COLLECTED TOTAL A. SOURCE MATERIAL (kg)	(lb)	B. SNM (g)	C. ACTIVITY (MBq)	(mCi)	D. VOLUME (m3)	(ft3)	E. WEIGHT (lb)	F. MAXIMUM PACKAGE RADIATION LEVEL (mrem/hr)
0137-00-97-E	Paul Angelis (508) 233-5208	HQ, US Army Soldier Sys. Com. Kansas, St Natick, MA 01760-5409	glass,paper,plastic,rubber metal, plexiglass 35 / 39 H	N/A	N/A	N/A	C	MA	NP	NP	NP	178.326088	4.819624	0.658	23.5	100	24
			chk sources, GCD's, guage 36H	N/A	N/A	N/A	C	MA	NP	NP	NP	9153.30392874597	247.38659266881	0.014	0.5	20	
			solidifed liquids 59H	N/A	N/A	N/A	C	MA	0.334423	0.737	NP	2.92448	0.07904	0.056	2	130	
TOTALS OF ALL PAGES (FORMS 542 AND 542A)									0.334423	0.737	0	9334.55449674597	252.28525666881	0.728	26	250	N/A

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

December 31, 1997

Mr. Stephen R. Mapley, Chief
Radioactive Waste Disposal Division
U.S. Army Industrial Operations Command
Rock Island, Illinois 61299-6000

Dear Mr. Mapley:

I am responding to your September 19, 1997 letter to Mr. Jamnes Cameron regarding the necessity for Industrial Operations Command (IOC) to secure a license for conducting activities associated with radioactive waste handling. We have determined, as described below, that IOC does not need a license for these activities.

Specifically, you indicated that IOC, as the Executive Agency for Low-Level Radioactive Waste for the Department of Defense (DoD), is responsible for directing the DoD in the proper methods of packaging, manifesting, transporting, and disposal of low-level radioactive waste. One service IOC offers to other DoD agencies is onsite assistance with waste shipments. The IOC also arranges the transportation and packaging, assists in the packaging, if necessary, manifests the shipment, and contracts for processing and/or disposal at other facilities as requested. At no time during the process is the material transferred from the other DoD agency licenses to IOC's license. The IOC staff, while performing these types of operations, works under the DoD host's license. The DoD host installation remains the generator/shipper of record and continues to assume all regulatory responsibility for the shipment.

Based on our understanding of the facts at hand, IOC does not need to obtain a license for its consulting services described in your letter. As a general matter, consulting services alone do not trigger the requirement for a license. During such consultation, the license holder in question is legally responsible for the material and for compliance with the NRC's regulations. However, if IOC's involvement with the material becomes so extensive as to effectively take control of possession of the material away from the DoD host licensee, the need for IOC to obtain a license would have to be reevaluated.

If you have any questions regarding this issue please contact Mr. Jamnes Cameron of my staff at (630) 829-9833.

Sincerely,

Cynthia D. Pederson

Cynthia D. Pederson, Director
Division of Nuclear Materials Safety

Please
FAX to Bob Cherry
Bob Lingo
Chuck Pelsey
CF MSCs (USASAC, STRICOM)

RECEIVED
AMCSF 11-110
JAN 06 1998
003088

05 JAN 1998

To: smtp@osid7[<pangelis@Natick-EMH2.Army.Mil>]
From: "David W" <david.w@gpimail.com>
Cc:
Bcc: Paul Angelis@SpecStaff
Subject: 5 gallons of vermiculite
Attachment:
Date: 10/24/97 3:46 PM

Mr. Angelis:

I just recieved the response from the TSD in Houston, TX that handles incinerable mixed waste. It was an order of magnitude more than I expected.

He gave us a price of $4504.00.

I presently don't have any other more cost effective alternatives. Let me know what you think, although I think I have a pretty good idea of your response.

Thanks for your time. I look forward to seeing you again in the future.

David A. Wise, CHMM
david.w@gpimail.com

To: smtp@osid7[<pangelis@Natick-EMH2.Army.Mil>]
From: "David W" <david.w@gpimail.com>
Cc:
Bcc: Paul Angelis@SpecStaff
Subject: Test & Eval Doc for 7A Type A containers
Attachment:
Date: 10/20/97 1:31 PM

Mr. Angelis:

Thank you for your time this morning and your uplifting comments regarding our service to you, John and Soldier Sys. Com.

The Test and Evaluation Document For DOT Specification 7A Type A Packaging can be found at the address below. It is a huge document and is somewhat cumbersome to navigate through.

http://www.hanford.gov/pss/t&p/dot7a/pdot7a.htm

Thank you for your time.

David A. Wise, CHMM

Catalytic Extraction Processing Offers Alternative to Incineration

On March 12, 1996, Molten Metal Technology, Inc. (MMT—Waltham, Massachusetts) announced that EPA has recognized its proprietary, noncombustive pollution prevention and recycling technology, catalytic extraction processing (CEP), as achieving the best demonstrated available technology (BDAT) requirements [per §268.42(b)] for processing all wastes for which incineration was previously the only approved treatment method. In fact, CEP was specifically added to the definition of the combustion treatment method (which has a five-letter code of CMBST) in the land disposal restrictions (LDR) treatment standards [Table 1 of §268.42(a)]. (For more about LDR standards and the changes to the definition of the CMBST treatment method, see page 4.11 of the May/June 1996 issue of *The Hazardous Waste Consultant*.)

This BDAT equivalency determination caps a successful technology development program that has produced a treatment alternative applicable to nearly any hazardous- or mixed-waste stream. CEP breaks down hazardous wastes into elemental form and produces marketable by-products. Destruction and removal efficiencies (DREs) of 99.9999% or greater are regularly achieved.

CEP is being used in a growing number of commercial applications, and business alliances implementing the process continue to proliferate. Two papers describing the technology and some of its recent applications are:

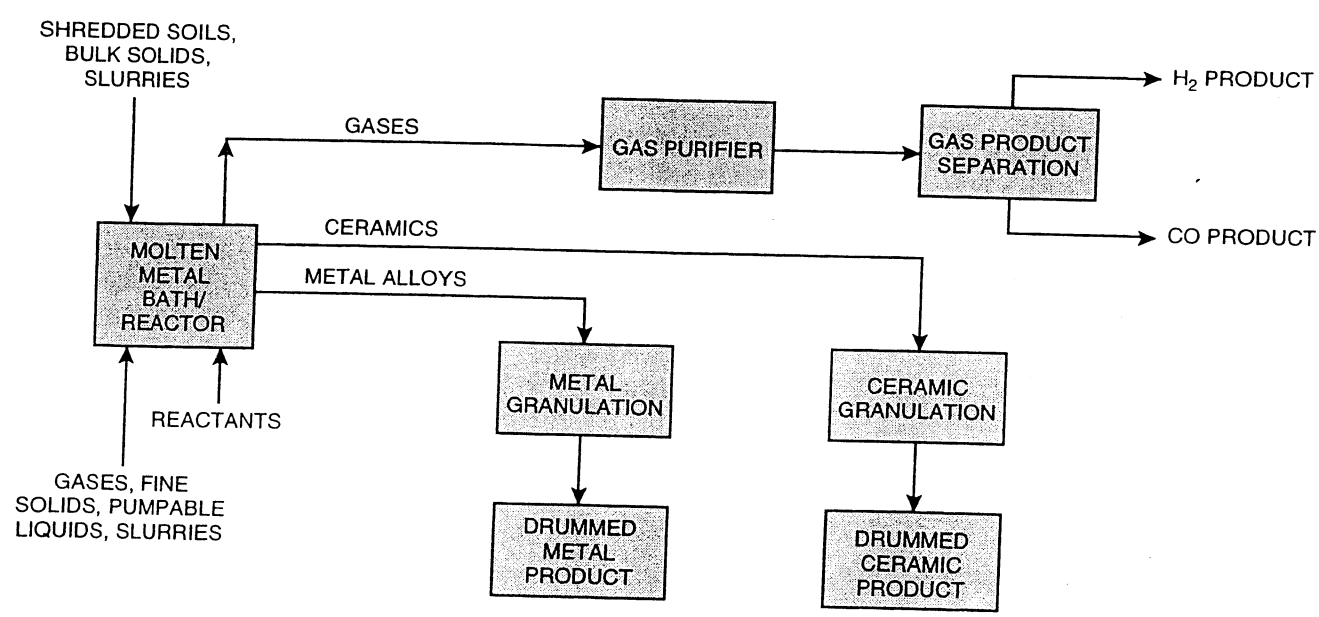
- "Integrated Recycling of Industrial Waste Using Catalytic Extraction Processing at a Chemical Manufacturing Site," by Robert Mather et al. of Hoechst Celanese Corporation (Charlotte, North Carolina), presented at the spring national meeting of the American Institute of Chemical Engineers, which was held March 19–23, 1995 in Houston, Texas; and
- "Quantum-CEP™ Applications to Mixed and Radioactive Wastes," by Christopher A. Herbst et al. of MMT, presented at Waste Management '95, which was held February 26–March 2, 1995 in Tucson, Arizona.

CEP Technology

In catalytic extraction processing, waste materials of any physical form (i.e., gas, liquid, slurry, sludge, or solid) are injected into a bath of molten iron (nickel can also be used). The iron acts as both a catalyst and a solvent, and the waste feed is broken down into elemental form. CEP operating parameters and reactant additions can be tailored to convert nearly any hazardous material into useful products, including recyclable metals, ceramics, and gases that can be used in chemical manufacturing processes.

How It Works

MMT's basic CEP system is illustrated in Figure 1. Iron is maintained in a molten metal bath, where both chemical reactions and product separation occur. The iron initially



Source: Adapted from Molten Metal Technology, Inc.

FIGURE 1
Block Flow Diagram of MMT's Catalytic Extraction Processing System

The Hazardous Waste Consultant: September/October 1996
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can be heated in the refractory-lined, steel-shell reactor vessel by induction coil, oxyfuel burner, plasma torch, or electric arc with retractable electrodes. The iron is typically heated to about 3,000°F (1,650°C). Although some supplementary fuel may be required to maintain bath temperature, chemical energy from waste feed dissociation continually adds heat to the bath.

Depending on the form and size of the waste material, the feed stream is injected into the bath via top hopper, top-mounted lance injection, or submerged-bottom tuyère injection. The waste feed generally does not require pretreatment, but drying or grinding may be cost-effective in specific cases.

Although the process occurs at high temperature, the specific operating temperature is not critical to the process. Complex compounds in feeds are dissociated into their elements through the catalytic effect of the molten metal. The elements then readily dissolve in the metal bath, forming elemental intermediates. The catalytic and solvation effects of the metal bath ensure that, unlike open-flame combustion technologies, CEP forms only elemental intermediates in the bath.

Dissociated elements 1) dissolve into the metal bath (metal alloys), 2) form a distinct molten layer on the surface of the bath (ceramics consisting of inorganic oxides, halides, and sulfides), or 3) are emitted from the bath in gaseous form. The ceramic layer serves as a scrubber for evolving gases and as an insulator for the molten bath. The metals and ceramics are removed via tap holes in the reactor; these product streams can then be cast or granulated. The gases exhaust from the top of the reactor and are directed to a product recovery train for purification and separation.

Process Thermodynamics

MMT has established operating conditions which ensure that dissolved elemental carbon is the only carbon intermediate in the iron bath. Because other carbon-based free radical intermediates are not present, the bath does not promote formation of unwanted by-products such as dioxins and furans.

MMT maintains the bath at an elemental carbon concentration of at least 0.5% by weight, which ensures a reducing environment for compounds such as sulfur dioxide, carbon dioxide (CO_2), water, and many metal oxides. Under these conditions, the bath will also convert excess oxygen (i.e., oxygen in excess of that required to react with the available carbon) to ferrous oxide, precluding formation of sulfur and nitrogen oxides, dioxins, and furans. The thermodynamics of this environment also generally favor carbon monoxide (CO) over CO_2 formation.

Compared to incineration, CEP results in virtually no dioxin and furan formation (nondetectable to 0.1 ng toxicity equivalent/Nm^3).

Marketable By-Products

Metallic wastes fed into the CEP reactor can generate valuable ferroalloys or pure metals. Inorganic wastes may result in useful ceramic products, such as abrasives or construction materials. Generally, metals with a Gibbs free energy of oxidation higher than that of carbon (e.g., cobalt, copper, nickel) can be recovered as alloys from the bath. Metals whose free energy of oxidation is lower than carbon's (e.g., aluminum, calcium) partition to the ceramic phase in the form of oxides.

Hydrocarbon feeds generally produce synthesis gas (syngas), a combination of CO and hydrogen (H_2). Although CO_2 is generally preferred over CO from an emission standpoint, CO is a useful by-product as a fuel or chemical production intermediate. Syngas can be used as a starting reagent for methanol production, fuel generation, ammonia synthesis, and other similar processes. Additionally, CO is used in acetic acid and phosgene production, and H_2 is used at refineries for hydrotreating. The predicted ratio of CO to CO_2 formation from the CEP bath is 10,000:1; similarly, H_2 to H_2O production is 2,000:1.

CEP operating parameters can also be adjusted to allow recovery of chlorine and sulfur in various product forms. For example, the addition of calcium to the bath will convert chlorine in the waste feed to calcium chloride, which can be recovered from the ceramic phase. Without calcium, chlorine in the feed will form hydrochloric acid (HCl) and ferrous chloride ($FeCl_2$). $FeCl_2$ can be recovered as a marketable by-product or recycled into the bath to form HCl.

CEP Advantages

Conventional hazardous waste treatment has been dominated by incineration and landfilling. Compared to these technologies, MMT notes that CEP offers the following advantages:

- DREs of greater than 99.9999% for organic compounds.
- Recovery of valuable by-products, some of which can be produced at costs lower than conventional production techniques.
- Virtually no dioxin and furan formation (nondetectable to 0.1 ng toxicity equivalent/Nm^3). Nitrogen oxides formation can be less than 3 ppm, and sulfur dioxide formation can be less than 1 ppm.
- Potential for installation as a closed-loop system, recycling industrial process intermediates before they become wastes (and possibly qualifying for regulatory exemptions).
- Lower operating costs than rotary kiln incineration due to efficient heat transfer.
- Reliance on proven technology borrowed from standard metallurgical and chemical processing technologies.

CEP Performance

To demonstrate the CEP technology, MMT built a commercial prototype CEP unit at its research and development facility in Fall River, Massachusetts. (The facility also houses several bench- and pilot-scale units.) Treatment of a broad spectrum and throughput of waste streams has been demonstrated in this unit. Based on testing in the demonstration unit, estimates for throughput in commercial facilities have been developed, as given in Table 1 (page 1.14).

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Processing Hazardous Wastes

MMT has treated a broad range of heterogeneous hazardous waste streams with its demonstration unit. Table 2 summarizes the results of several of these demonstrations, which are further described below:

- F024 wastes (distillation residues, heavy ends, tars, and reactor clean-out wastes from chlorinated aliphatic hydrocarbon production), mixed with other chlorinated and nonchlorinated wastes, were converted predominantly to syngas and anhydrous HCl gas. Volatile constituents of F024 wastes include chlorobenzene, 1,1,2,2-tetrachloroethane, and 1,1,2-trichloroethane.
- Industrial residual biosolids from wastewater treatment were spiked with polyvinyl chloride and treated. During the tests, dioxins were not detectable and nearly 100% of the waste feed was recovered as syngas, ceramics, and nitrogen gas (N_2).
- K019 and K020 wastes (heavy ends from ethylene dichloride/vinyl chloride production), combined with other chlorinated and nonchlorinated wastes, were converted to syngas and ceramics.
- K027 wastes (organically bound nitrogen and toxic isocyanates). were processed to produce primarily syngas and N_2.
- Surplus electronic components, including electrical insulation, circuit boards, wire, and other circuitry, were successfully treated to produce metal alloys from reducible metals, syngas from organic feed materials, and ceramics from nonreducible metals. More than 90% of the feed materials were recycled into commercially viable by-products.

All ceramic materials produced in the treatment of these wastes passed the toxicity characteristic leaching procedure (TCLP) standard.

Processing Mixed Wastes

CEP technology has been applied to mixed-hazardous and radioactive wastes in the form of the specialized Quantum-CEP™ unit. Quantum-CEP™ reduces the volume of low-level mixed waste (LLMW) and stabilizes the radionuclides for subsequent management.

TABLE 1

Estimated Commercial Throughputs Based on CEP Treatment of Various Waste Streams in MMT's Demonstration Unit

Waste stream	*Reactor metal volume (ft^3)*	*Maximum sustained throughput in demonstration unit (lb/min)*	*Estimated throughput for commercial unit (tons/year)*[1]
Chlorine liquid	12.0	3	770
Coal/petroleum coke	23.0	86	21,000
Complex organics	19.0	42	10,000
Contaminated metal	12.0	70	17,000
Contaminated refractory/metal	12.0	7	1,600
Organic liquid	1.2	0.5	110

CEP = catalytic extraction processing; MMT = Molten Metal Technology, Inc.

[1]Based on 8,000 hours/year.

Source: Adapted from Molten Metal Technology, Inc.

Volume Reduction

Expected volume reduction for various LLMW streams range from 2:1 for soil to more than 100:1 for organic sludge and combustible debris. Volume reduction of more than 30:1 is predicted for spent ion exchange resins.

Scrap Metal

Contaminated scrap metal treated via CEP has resulted in greater than 99% metal decontamination. During such decontamination, Quantum-CEP™ partitions radioactive uranium, plutonium, and similar materials from the metal-phase feed to the ceramic-phase by-product. Tests indicate that residual concentrations in the metal phase range from 0.05 to 2 ppm, and treated metals typically exhibit less than 10 nCi/g of radioactivity. Testing with a system of iron, aluminosilicate, and uranium demonstrated uranium decontamination of greater than 99.77%.

Spent Ion Exchange Resins

CEP treatment of spent ion exchange resins (used in nuclear power plants for water purification) has produced gas decontamination factors greater than 1×10^7. Radionuclides may be partitioned into any of the three phases (i.e., metal, ceramic, or gas) depending on the radioactive compound. Those incorporated into ceramic glasses with high chorine content have demonstrated TCLP durability better than high-level nuclear waste reference glasses.

Prior to testing with radioactive material, surrogate testing with nonradioactive resin demonstrated a DRE of greater than 99.9999% (lower detection limit: 1.2 ppb). Bench-scale testing with spent ion exchange resin was subsequently conducted. Radionuclide closure of 105% ± 7% and an analytical limit decontamination factor of greater than 1×10^4 were demonstrated.

Applications and Alliances

EPA's recognition of the noncombustive CEP as achieving BDAT for processing all wastes for which incineration was previously the only approved processing method should continue to generate markets for this technology. The BDAT status also confirms MMT's assertion that CEP is fundamentally different from incineration. In its determination, EPA noted that dioxin was not detected at targeted levels in CEP demonstrations.

MMT started up its first commercial facilities in 1995, mostly in partnership with other companies. Partnerships/applications include the following:

- M4 Environmental (Oak Ridge, Tennessee), a limited partnership between MMT and Lockheed Martin, is delivering CEP to the U.S. Departments of Energy (DOE) and Defense (DOD). Applications include 1) a demonstration system converting ura-

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TABLE 2
Major Waste Materials Processed in the CEP Demonstration Unit

	Waste destruction performance			*Environmental performance*	
Waste material	*Destruction and removal efficiency*[1] *(%)*	*Percent of feed recovered*	*Residue*	*Did ceramics pass the TCLP?*	*Offgas contaminant concentrations*
F024[2]/chloro-toluene/fuel oil	≥99.9999	82% to syngas 13% to HCl gas <1% to ceramics	Negligible dust	Yes	PICs < LDL of 1 ppm CO_2 <1% NO, SO_2 < LDL of 100 ppm
Industrial biosolid waste	≥99.9999	70% to syngas 20% to ceramics 8% to nitrogen 1% to ferroalloy	Negligible dust	Yes	PICs < LDL of 1 ppm CO_2 <1% NO_x <3 ppm SO_2 < LDL of 1 ppm
K019/K020[3]/chloro-benzene/fuel oil	≥99.9999	76% to syngas 23% to ceramics	Negligible dust	Yes	PICs < LDL of 1 ppm CO_2 <1% NO, SO_2 < LDL of 100 ppm
K027[4]	≥99.9999	93% to syngas 5% to nitrogen <1% to ceramics <1% to ferroalloy	Negligible dust	Yes	PICs < LDL of 1 ppm CO_2 <1% NO, SO_2 < LDL of 100 ppm
Surplus electronic components[5]	NA	63% to ferroalloy 25% to syngas 8% to ceramics	Negligible dust	Yes	PICs < LDL of 1 ppm CO_2 <1% NO, SO_2 < LDL of 100 ppm

CEP = catalytic extraction processing; CO_2 = carbon dioxide; HCl = hydrogen chloride; LDL = lower detection limit; NA = not applicable; NO = nitric oxide; NO_x = nitrogen oxides; PICs = products of incomplete combustion; SO_2 = sulfur dioxide; TCLP = toxicity characteristic leaching procedure.

[1]Destruction and removal efficiencies based on EPA Method TO-14.

[2]F024 includes chlorinated aliphatic hydrocarbons, such as distillation residues, heavy ends, tars, and reactor clean-out wastes.

[3]K019/K020 include heavy ends from ethylene dichloride/vinyl chloride production.

[4]K027 includes centrifuge and distillation residues from toluene diisocyanate production.

[5]Including electrical insulation, circuit boards, wire, and other circuitry.

Source: Elsevier Science Inc.; adapted from R. Mather et al.

nium enrichment waste into useful raw materials for the U.S. Enrichment Corporation; 2) a commercial unit (lifetime capacity of 1 million pounds) processing mixed waste for DOE, which began operating in December 1995; 3) a second commercial unit (lifetime capacity of 10 million pounds) also processing DOE mixed wastes, which was commissioned in June 1996; and 4) a demonstration unit at the Battelle Memorial Institute being evaluated by the U.S. Army as one of three innovative technology finalists for processing chemical weapons waste. The Army demonstration unit has shown greater than 99.999999% DRE.

- Scientific Ecology Group (SEG—Oak Ridge, Tennessee), a Westinghouse subsidiary, is jointly operating a Quantum-CEP™ facility with MMT to process low-level radioactive waste. Radioactive ion exchange resins from nuclear power plants are being processed. Waste volume is reduced by a ratio of more than 30:1, and the process recycles syngas to the plant's feed preparation process. The facility can process up to 650 high-integrity containers or 130,000 ft^3 of ion exchange resin per year (65% of the U.S. market).

- A CEP facility at the Hoechst Celanese chemical production plant in Bay City, Texas will produce syngas for use at the plant from treatment of hazardous and nonhazardous wastes. Marketable metal alloy and ceramic products will also be produced by the facility. MMT is building and will operate the 24,000-tons/year facility, which should be on-line by early 1997.

- A second CEP facility with a capacity of 50,000 tons/year will be constructed at another Hoechst plant, Celanese Mexicana (Veracruz, Mexico). The facility is scheduled for commissioning by the end of 1997.

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business alliances for CEP technology. Uhde, a German engineering and construction company, will market CEP to its clients worldwide. The alliance calls for Uhde to identify and sell a minimum of nine CEP projects outside the United States over the next four years.

In Japan, MMT has joined with Nichimen/NKK Plant Engineering Corporation to launch Cerex-CEP™, a product line for converting incinerator ash into marketable products. A demonstration system is scheduled erators and operates 85 of them.

Technical Contact: Pati Moise, Molten Metal Technology, Inc., 400-2 Totten Pond Road, Waltham, MA 02154, (617) 487-7671.

References: R. Mather et al., "Integrated Recycling of Industrial Waste Using Catalytic Extraction Processing at a Chemical Manufacturing Site," presented at the AIChE 1995 Spring National Meeting. For availability, contact AIChE, 345 East 47th Street, New York, NY 10017, (212) 705-7611.

Published in *Proceedings of the Waste M agement '95 Conference*. Available (on ROM only) from WM Symposia, Inc., South Plumer, Suite 19, Tucson, AZ 85 at a cost of $65.

Pati Moise, Molten Metal Technol Inc., personal communication, July 1996

Michele R. Perry, Molten Metal Tech ogy, Inc., personal communication, April 1

Innovative Bioremediation Technologies—Obstacles to Use Can Be Overcome

Despite their ultimate cost-saving potential, innovative bioremediation technologies have not yet been widely used due to reluctance on the part of clients, engineers, and regulators to support new, unproven cleanup options. The major obstacles to development include lack of communication between technology developers and engineers, regulatory barriers, technical scale-up unknowns, and financial risk.

These obstacles and suggestions for overcoming them have been described by Michael J. Ryan et al. of Bechtel Environmental, Inc. (Oak Ridge, Tennessee) in "Moving Innovative Biotechnologies to the Field: An Engineering Perspective." The paper was presented at the Bioremediation of Surface and Subsurface Contamination conference, held January 21–26, 1996 in Palm Coast, Florida.

New Technologies Pose Several Challenges

When attempting to implement any new technology, success will depend on several factors. First of all, developers must demonstrate that the innovative technology works and provides one or more advantages over conventional methods. For instance, the new technology could be shown to be less expensive, faster to implement, more effective, more reliable, or safer than conventional technologies. To demonstrate this, the developer must understand the needs of the clients and consulting engineers. On the other hand, any real or potential disadvantages must be identified as well.

Finally, the developers must overcome any uncertainty that engineers, regulators, and the public have about the technology. Lack of information on the cost and performance of innovative technologies has caused many methods to be eliminated from consideration.

Fear of Risk and Lack of Incentives Are Major Obstacles

Although some strides are being made in the use of innovative bioremediation technologies, progress has not been as great as originally projected. Most sites continue to be remediated using conventional technologies (e.g., excavation and landfilling, incineration, stabilization—which may be less cost-effective than bioremediation) due to fear of risk and lack of incentives. For example:

- Site managers responsible for cleanups may not want to "go out on a limb" and risk failure. Consequently, they select proven, conventional technologies that have a high probability of ultimate success.
- Regulators want to minimize environmental risks and therefore may prefer proven, conventional methods.
- Entrepreneurs who provide financial backing for technology development want the technology to be applied as quickly as possible so that they can realize a ret on their capital investment. Bioremed tion is not a "quick" process; therefore is more difficult to find financing.
- Many engineering companies have co plus contracts that maximize gross re nues when resource-intensive, long-te cleanups using conventional technologi are employed. As a result, they may hesitant about recommending a new tec nology that limits those revenues. Mo importantly, they want to avoid situatio in which use of an innovative technolo exposes them to financial liability if t technology fails to meet cleanup criteri
- The persons responsible for cleanup (i.e the clients and customers who have t problem) want a solution that is effectiv fast, and inexpensive based on demo strated results and (typically) the reco mendation of their consulting engineerin firm. Many clients believe that, as long a the hazardous wastes are onsite, they ca still incur liability and their public imag will be poor. Even though bioremediatio may be less expensive, it may increase th liability and public relations risks becaus wastes remain onsite, making its use les desirable.
- Many parties question the effectiveness o innovative technologies because they lack a general understanding of how the technologies work.

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SGT David Wise Mark Smith
#602-739-1885
Patrick Haywood
309-782-1766
793-1766
FAX -2988

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(etidronate disodium)

1-800-796-7363
1046393
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Bisphosphonate therapy from Norwich Eaton

To: <pangelis@natick-amed02.army.mil>
From: System@ria-emh1.army.mil
Cc:
Bcc:
Subject: Failed mail
Attachment: ATTRIBS.BND
Date: 5/6/97 7:32 AM

These users were not found:

PHAYWORTH@RIA-EMH1.ARMY.MIL

Forward-Path: <phayworth@ria-emh1.army.mil>
Return-Path: <pangelis@natick-amed02.army.mil>
Received: from natick-amed02.army.mil by ria-emh1.army.mil; 06 May 97 07:19:59 CDT
Received: by natick-amed02.army.mil with VINES-ISMTP; Tue, 6 May 97 8:16:26 EDT
Date: Tue, 6 May 97 7:58:15 EDT
Message-ID: <vines.erc7+OmlPnA@natick-amed02.army.mil>
X-Priority: 3 (Normal)
To: <phayworth@ria-emh1.army.mil>
Cc: <jmchugh@natick-amed02.army.mil>,
<pangelis@natick-amed02.army.mil>
From: <pangelis@natick-amed02.army.mil>
Subject: LLRW Disposal Request

Patrica,

I would like to amend the U.S. Army Soldier Systems Command (SSCOM) request of 28 February 1997, subject: Request for Low Level Radioactive Waste (LLRW) Disposal Instructions.

We have just removed a 15 mCi Ni-63 Electron Capture Detector, sealed source, from an item of excess laboratory equipment - Perkin-Elmer Corp., Model Sigma Series, Gas Chromatograph.

Your assistance in including this item for final disposal will be greatly appreciated. Additionally, as we spoke this morning the timely off site shipment of SSCOM LLRW is very important. SSCOM does not have NRC License authorization for extended storage of LLRW and it has been quite some time since the last off site shipments of LLRW were made.

Thank you,
//s//
Paul G. Angelis
^

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY SOLDIER SYSTEMS COMMAND (PROV)
NATICK, MA
01760-5049

REPLY TO
ATTENTION OF

AMSSC-S-ENS (385-11e) 28 February 1997

MEMORANDUM FOR Commander Industrial Operations Command, DoD Executive Agency For Low Level Radioactive Waste, ATTN: AMSIO-DMW, Rock Island, IL 61299-6000

SUBJECT: Request for Low Level Radioactive Waste (LLRW) Disposal Instructions

1. Reference Army Regulation 385-11, Ionizing Radiation Protection, dated 1 May 1980.

2. The U.S. Army Soldier Systems Command (SSCOM) as a U.S. Nuclear Regulatory Commission (NRC) By-product Material Licensee, NRC License #20-00315-02, utilizes radioactive materials in laboratory research and development. As a result of these research activities Low Level Radioactive Waste (LLRW) in the form of gloves, wipes, laboratory glass/plastic, etc. has been generated, accumulated and presently requires off-site disposal.

3. Requests your assistance in providing off-site shipping and disposal instructions for the following LLRW:

a. H-3, LLRW Laboratory trash.....1,647.11 μCi

b. H-3, Contaminated compact refrigerator door..(2"x18"x24").....1.0 μCi

c. H-3, Contaminated Plexiglass storage cube..(10" cube).....1.0 μCi

d. C-14, LLRW Laboratory trash.....1,980.0 μCi

e. C-14, Contaminated plastic barrel.....1.0 μCi

f. C-14, Contaminated Plexiglass storage cube..(10" cube).....1.0 μCi

g. H-3 & C-14, LLRW Laboratory trash.....10.21 μCi

h. H-3 & C-14, Contaminated drain pipes and hoses.....1.0 μCi

I. Ca-45, LLRW Laboratory trash..... 2,140.55 μCi

4. A review has been completed of radioactive sealed (equipment & calibration) and check sources which are not longer required for current and future investigations, enclosure 1. Additionally, we presently have also collected from our laboratories waste Uranyl Nitrate (<1 Kg

solid and <3 L liquid) and Thorium Nitrate (< 1 Kg solid) for disposal off-site. We also request your assistance in providing disposal instruction for these items.

5. Volumes of LLRW laboratory trash are:

a. H-3, approximately two and one half (2 ½) 55 gallon drums.

b. C-14, approximately one (1) 55 gallon drum.

c. H-3 & C-14, approximately one fourth (1/4) of a 55 gallon drum.

d. Ca-45, approximately one half (½) of a 55 gallon drum.

6. Volume of the surface radioactive contaminated items, sealed and check sources is approximately three quarters (3/4) of a 55 gallon drum.

7. Prior to release for off-site shipment and disposal SSCOM requests an opportunity to ensure Principle Users responsible for generating the LLRW laboratory trash have not inadvertently included prohibited materials, such as vials containing free standing liquids. This would be accomplished by reviewing (transfer) the contents of each bag individually into plastic bags approximately 2 ft. x 2 ft. 11 in. x 2 mil thick. SSCOM personnel would require a two week window of opportunity prior to pick-up to complete this task without adversely impacting normal daily activities.

8. LLRW would be shipped from this command, U.S. Army Soldier Systems Command, ATTN: AMSSC-S-ENS (P. Angelis), Kansas St., Natick, MA 01760. Should you have any questions regarding this request please contact me directly. I may be reached at comm (508) 233-5208 or DSN 256-5208 and via e-mail at pangelis@natick-emh2.army.mil.

Encl

PAUL G. ANGELIS
Radiation Protection Officer

ITEM	ACTIVITY/ ISOTOPE
Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5840A, S/N 2107A08582 ECD Model #18803-60520, S/N C1924	15 mCi Ni-63 November 1984
Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5750 (5754B), S/N 746B01161 ECD Model #2-6195, S/N A755	2 mCi Ni-63
Electron Capture Detector, Gas Chromatograph, Bendix Corp. Model #25621R, S/N 100129 ECD Model #2500 (HP), S/N 18713A	15 mCi Ni-63
Static Electricity Eliminator B.K. Sweeney Mfg. Co. Model #7777	200 mCi H-3 August 1967
Vacuum Gage National Research Corporation Model #58796	275 µgram Ra-226
Vacuum Gage National Research Corporation Model #530 Alphatron	100 µgram Ra-226
Check Source (Plastic Rod)	1.5 µCi Ba-133
Check Source (Cyl. Slug)	0.5 µCi Ba-133
Check Source (Disk)	3.2E-4 µCi Cf-252
Tracerlab Sealed Source w/Pig Cat. No. R-31, S/N B-311	1.2 mCi Co-60 February 1959
Check Source (Disk)	0.0476 µCi Po-210 February 1989
Check Source (Disk)	335 dpm Co-60 February 1997
Check Source (Disk)	45,178 dpm C-14 February 1997
Check Source (Disk)	2.58E5 dps C-14 January 1962

Check Source (Disk)	1.57E3 dps Co-60 January 1962
Check Source (Disk)	3.55E3 dps Tl-204 January 1962
Check Source (Disk)	2.97E3 dps Bi-210 January 1962
Check Source (Disk)	2.25E3 dps Ru-106 January 1962
Check Source (Metal Slug)	848 dpm, Co-60 February 1997
Check Source (Metal Slug)	960 dpm, Co-60 February 1997
Check Source (Plastic Rod)	0.1 μCi Cs-137 October 1977
Check Source (Plastic Rod)	I-129, Packard H-188
Check Source (Plastic Rod)	Cs-137, Packard A-384
Check Source (Plastic Rod)	Cs-137, Packard AB-158
Glass Capsules, Internal Stds.	<2.2 μCi C-14

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY SOLDIER SYSTEMS COMMAND (PROV)
NATICK, MA
01760-5049

REPLY TO
ATTENTION OF

AMSSC-S-ENS (385-11e) 17 February 1997

MEMORANDUM FOR Commander Industrial Operations Command, DoD Executive Agency For Low Level Radioactive Waste, ATTN: AMSIO-DMW, Rock Island, IL 61299-6000

SUBJECT: Request for Low Level Radioactive Waste (LLRW) Disposal Instructions

1. Reference Army Regulation 385-11, Ionizing Radiation Protection, dated 1 May 1980.

2. The U.S. Army Soldier Systems Command (SSCOM) as a U.S. Nuclear Regulatory Commission (NRC) By-product Material Licensee, NRC License #20-00315-02, utilizes radioactive materials in laboratory research and development. As a result of these research activities Low Level Radioactive Waste (LLRW) in the form of gloves, wipes, laboratory glass/plastic, etc. has been generated, accumulated and presently requires off-site disposal.

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I. Ca-45, LLRW Laboratory trash..... 2,140.55 μCi

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solid and <3 L liquid) and Thorium Nitrate (< 1 Kg solid) for disposal off-site. We also request your assistance in providing disposal instruction for these items.

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8. LLRW would be shipped from this command, U.S. Army Soldier Systems Command, ATTN: AMSSC-S-ENS (P. Angelis), Kansas St., Natick, MA 01760. Should you have any questions regarding this request please contact me directly. I may be reached at comm (508) 233-5208 or DSN 256-5208 and via e-mail at pangelis@natick-emh2.army.mil.

Encl

PAUL G. ANGELIS
Radiation Protection Officer

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Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5750 (5754B), S/N 746B01161 ECD Model #2-6195, S/N A755	2 mCi Ni-63
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Check Source (Cyl. Slug)	0.5 μCi Ba-133
Check Source (Disk)	3.2E-4 μCi Cf-252
Tracerlab Sealed Source w/Pig Cat. No. R-31, S/N B-311	1.2 mCi Co-60 February 1959
Check Source (Disk)	0.0476 μCi Po-210 February 1989
Check Source (Disk)	335 dpm Co-60 February 1997
Check Source (Disk)	45,178 dpm C-14 February 1997
Check Source (Disk)	2.58E5 dps C-14 January 1962

Check Source (Disk)	1.57E3 dps Co-60 January 1962
Check Source (Disk)	3.55E3 dps Tl-204 January 1962
Check Source (Disk)	2.97E3 dps Bi-210 January 1962
Check Source (Disk)	2.25E3 dps Ru-106 January 1962
Check Source (Metal Slug)	848 dpm, Co-60 February 1997
Check Source (Metal Slug)	960 dpm, Co-60 February 1997
Check Source (Plastic Rod)	0.1 μCi Cs-137 October 1977
Check Source (Plastic Rod)	I-129, Packard H-188
Check Source (Plastic Rod)	Cs-137, Packard A-384
Check Source (Plastic Rod)	Cs-137, Packard AB-158
Glass Capsules, Internal Stds.	<2.2 μCi C-14

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Check Source (Metal Slug)	XXXX, Co-60
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Check Source (Plastic Rod)	Cs-137, Packard A-384
Check Source (Plastic Rod)	Cs-137, Packard AB-158
Glass Capsules, Internal Stds.	<2.2 µCi C-14
Check Source (Cyl. Slug)	0.5 µCi Ba-133

ITEM	ACTIVITY/ ISOTOPE
Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5840A, S/N 2107A08582 ECD Model #18803-60520, S/N C1924	15 mCi Ni-63 November 84
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Vacuum Gage National Research Corporation Model #530 Alphatron	100 μgram Ra-226
Check Source (Plastic Rod)	1.5 μCi Ba-133
Check Source (Button)	3.2E-4 μCi Cf-252

RADIONUCLIDE INVENTORY

WORKSHEET

BML 20-315-2 (Exp. Date 31 July 1998) Date(s)

No.	Radio-nuclide	Amount (µCi)	Date Measured	Responsible Individual	Remarks RPO Reference No.
1	~~3 H~~	~~<0.2~~	~~Nov 88~~		~~Liq. STD Scint~~
2	~~14 C~~	~~<0.1~~	~~Nov 88~~		~~" " Scint~~
	~~241 Am~~	~~0.036~~	~~Jul 87~~		~~Button~~
✓	210 Po	0.0476	7 Feb 89	Check	" 2-7-97 1.3347x10⁻⁴ µCi-2-7
✓	~~14 C~~	~~0.0308~~	~~Jan 80~~		~~Tilt [illegible]~~
	14 C	<0.1			
✓	~~232 Th~~	~~0.05~~	~~Jan 80~~		
✓	14 C	2.58x10⁵	JAN 62		
✓	60 Co	1.57x10³			
✓	204 Tl	3.55x10³		D.P.M/Sec.	
✓	210 Bi	2.97x10³			
✓	106 Ru	2.25x10³	JAN 62		
✓	60 Co				Slugs -
✓	60 Co				Slugs -
	14 C	24 mCi ~~[illegible]~~	1/5/88	5 mCi	Stock
	3 H	55.2 mCi ~~[illegible]~~/g	8/10/89		"
	63 Ni	23.4 mCi	7/31/89		"
	137 Cs	45.8 mCi	9/21/88		"
	241 Am	22.9 mCi	4/13/89		"
	90 Sr	22.4 mCi	1/9/89		"
	60 Co	90.2 mCi	7/19/88		"
	59 Co	152 mCi	1/20/89		Stock
	14 C	20 µCi	84		
	14 C	2.0x10³ DPM	?		2.0x10⁵ Total - .09 = 90.09

RADIONUCLIDE INVENTORY

WORKSHEET

BML 20-315-2 (Exp. Date 31 July 1998) Date(s)

No.	Radio-nuclide	Amount (µCi)	Date Measured	Responsible Individual	Remarks RPO Reference No.
✓	$^{CS}137$	0.1 µCi	10-1-77		Rad - pea Type B.A.
✓	^{129}I				H-188 Packard Rad
✓	^{137}Cs				A-384 " Rad
✓	^{137}Cs		~~10-1-77~~		AP-158 Packard Rad
✓	^{14}C	< 2 µCi	2-5-77	40 caps	} Std glass capsules
✓	^{14}C	~~<~~ 0.20 µCi	2-5-77	5 caps	} Internal Stds
12	^{133}Ba	0.5	1-75 ~~[illegible]~~	10	Rad cyl slug

To: Joel Carlson@std
From: Paul Angelis@SpecStaff
Cc: Paul Angelis@SpecStaff
Bcc:
Subject: Sample Analysis
Attachment:
Date: 1/24/97 1:53 PM

Joel,

Thank you very much Sir, you did good! Just the type of information John S. & I were looking for.

As appreciation for your services you get one "GET OUT OF TROUBLE PASS" from us.

//s//
Paul G. Angelis

To: Paul Angelis@SpecStaff
From: Joel Carlson@std
Cc: Jean Mayer@std,Joel Carlson@std
Bcc:
Subject: Safety Office - Unknown Sample Analysis
Attachment:
Date: 1/24/97 12:44 PM

Paul,

I have conducted a gas chromatographic/mass spectrometric analysis on the the material provided to me by your office. The samples were not sealed in air tight vials and therefore it is likely that a large amount of the volatile organic components would have escaped. However, significant amounts of volatiles still remained in each of the sample bottles as follows:

Sample "SMALL":
Major components:

Toluene
Xylene

Minor components:

Diethoxy methane
Ethyl benzene
Methyl ethyl benzene

In addition: Insignificant levels of parafilm extracts (high molecular weight hydrocarbons) were detected indicating that the barrel is now, or has been sealed with parafilm.

Sample "LARGE":
Major components:

Cyclohexane

Minor components:

1,4-dioxane (trace levels)

No high molecular weight or semi-volatile components observed.

Note for both samples: The C13 isotope (stable) of carbon was detected in characteristic amounts of about 1 out of every 100 carbon atoms. The C14 isotope (if present) was well

'below this level.

JCarlson
5055

CDR IOC
ROCK ISLAND IL 61299-6000

OFFICIAL BUSINESS

AMSIO-DMW

AMSSC S ENS
ATTN MR P G ANGELIS
USA SOLDIER SYSTEMS COMMAND PROV
NATICK MA 01760 5049

01760/9999 52

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND
ROCK ISLAND, ILLINOIS 61299-6000

REPLY TO
ATTENTION OF

AMSIO-DMW (385-11e)

MEMORANDUM FOR Commander, U.S. Army Soldier Systems Command (PROV), ATTN: AMSSC-S-ENS (Mr. P. G. Angelis), Natick, MA 01760-5049

SUBJECT: Request for Assistance for the Disposal of Unwanted Radioactive Material from the U.S. Soldier Systems Command, Natick, MA, Project Number USA 97-051

1. We have received your request for assistance for disposal of radioactive material. We have reviewed the documentation provided and will be developing disposal instructions in the near future. We have assigned control number USA 97-051 to your request.

2. The POC is Ms. Patricia Haworth, AMSIO-DMW, DSN 793-1766 or (309) 782-1766, E-mail address phaworth@ria-emh2.army.mil.

STEPHEN R. MAPLEY
Chief, Radioactive Waste
Disposal Division

Printed on Recycled Paper

To: smtp@admin@imd2[phayworth@ria-emh1.army.mil]
From: Paul Angelis@SpecStaff
Cc: John McHugh@SpecStaff,Paul Angelis@SpecStaff
Bcc:
Subject: LLRW Disposal Request
Attachment:
Date: 5/6/97 7:58 AM

Patrica,

I would like to amend the U.S. Army Soldier Systems Command (SSCOM) request of 28 February 1997, subject: Request for Low Level Radioactive Waste (LLRW) Disposal Instructions.

We have just removed a 15 mCi Ni-63 Electron Capture Detector, sealed source, from an item of excess laboratory equipment - Perkin-Elmer Corp., Model Sigma Series, Gas Chromatograph.

Your assistance in including this item for final disposal will be greatly appreciated. Additionally, as we spoke this morning the timely off site shipment of SSCOM LLRW is very important. SSCOM does not have NRC License authorization for extended storage of LLRW and it has been quite some time since the last off site shipments of LLRW were made.

Thank you,
//s//
Paul G. Angelis

To: John McHugh@SpecStaff
From: Paul Angelis@SpecStaff
Cc: John Manning@SpecStaff,Paul Angelis@SpecStaff
Bcc:
Subject: Low Level Radioactive Waste (LLRW)
Attachment:
Date: 6/17/97 8:33 AM

John,

Just wanted to update you on the status of the LLRW in storage.

A few weeks ago I was finally contacted by a contractor for the folks from the DoD Executive Agency For LLRW at Rock Island, IL.

Last week John and I spent three days consolidating the H-3, C-14 and Ca-45 LLRW received from laboratories. This LLRW must be shipped off-site for burial in SC. As we consolidated all these individual bags into twelve bags John and I ensured no prohibited material, such as bio bags or liquids were included. These items will be returned to the researchers.

We also went through all the bags of I-125 that has been held for 10 half-lives, decayed in storage, and this has been disposed as trash or we will be returning this waste to USARIEM researchers for disposal as bio waste.

Currently SSCOM will have four 55 gallon drums of laboratory dry un-compacted waste, and some contaminated items such as drain pipes and small refrigerator door.

I will be contacting the folks at Rock Island and discussing their pickup schedule, let them know we have been ready, and try to made this happen.

//s//
Paul G. Angelis

To: smtp@admin@imd2[phaworth@ria-emh2.army.mil]
From: Paul Angelis@SpecStaff
Cc: Paul Angelis@SpecStaff
Bcc:
Subject: LLRW Disposal Request
Attachment:
Date: 8/13/97 2:28 PM

Hello Pat,

I have been working down several piles of file folders on my desk and I've shuffled the "LLRW Disposal Request" folder too many times not to ask you a few questions.

My first and biggest being schedule. Do you have a contractor identified and a project scheduled pick-up date for SSCOM's LLRW?

Secondly, there are two items which are being removed from the list, Laboratory trash,

04/04/96	McGrath	1000.0 micro Ci H-3
04/04/96	McGrath	50.0 micro Ci C-14

Third question is can two Co-60 and Cs-137 check or button sources be added to SSCOM's request? I should rephrase this to an opened ended question since I'm sure that someone will fine something that they no loner require just as the truck pulls up to the front gate!

Please call (DSN 256-5208) or e-mail me when you can, I have been asked the above, mostly the when question.

Thank you,
//s//
Paul G. Angelis

To: smtp@admin@imd2[phaworth@ria-emh2.army.mil]
From: Paul Angelis@SpecStaff
Cc: John McHugh@SpecStaff,Paul Angelis@SpecStaff
Bcc:
Subject: LLRW Pick-up
Attachment:
Date: 9/24/97 8:28 AM

Good morning Pat,

I have been thinking of you this week, well actually the contractor and truck going about picking up LLRW.

Would you please give me an update as to when they will be here so that John Sieckarski and I will be available.

Thanks,
//s//
Paul G. Angelis

To: smtp[phaworth@ria-emh2.army.mil]
From: Paul Angelis@SpecStaff
Cc: Paul Angelis@SpecStaff,smtp[jmanfre@alexandria-emh1.army.mil]
Bcc:
Subject: Low Level Radioactive Waste Shipment
Attachment:
Date: 10/6/97 8:12 AM

Pat,

I want to that this opportunity to express my thanks and appreciation to you and your broker for the pickup of SSCOM's Low Level Radioactive Waste last Wednesday.

I know four barrels of LLRW it might seem not a large and complicated shipment, but its been many delays and some time since the last shipment was made from here.

I'm virtually cleaned out! This is a great feeling to experience for

"WASTE IS A TERRIBLE THING TO MIND"

I will be replacing a soap stone sink soon and possibly that can be added to the next Northeast run.

Until then, Thanks again.
//s//
Paul G. Angelis
Radiation Protection Officer, SSCOM

To: Paul Angelis@SpecStaff
From: smtp@osid13
Cc:
Bcc:
Subject: Certification Message
Attachment: ATTRIBS.BND
Date: 10/6/97 8:27 AM

This message was generated electronically by the SMTP gateway. Report any errors to your gateway administrator.

Hi Paul Angelis@SpecStaff@natick:

The following message

Sent On: Monday, October 6, 1997 at 8:12:31 am EDT
Subject: Low Level Radioactive Waste Shipment
To: phaworth@ria-emh2.army.mil

Text: Pat,

I want to that this opportunity to express my thanks and appreciation to you and your broker for the pickup of SSCOM's Low Level Radioactive Waste last Wednesday.

I know four barrels of LLRW it might seem not a large and complicated shipment, but its been many delays and some time since the last shipment was made from here.

I'm virtually cleaned out! This is a great feeling to experience for

"WASTE IS A TERRIBLE THING TO MIND"

I will be replacing a soap stone sink soon and possibly that can be added to the next Northeast run.

Until then, Thanks again.
//s//
Paul G. Angelis
Radiation Protection Officer, SSCOM

Has been relayed

To: jmanfre@alexandria-emh1.army.mil, phaworth@ria-emh2.army.mil
Via: ALEXANDRIA-EMH1.ARMY.MIL (at 192.129.67.5), RIA-EMH2.ARMY.MIL (at 192.35.154.60)

RAD WASTE INVENTORY LOG

Isotope: H-3 Half-Life: 12.43 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity		Bag No.
03/07/86	Dr. Dubose	NA	25	µCi	1
03/12/86	"	"	25	"	1
03/18/86	"	"	25	"	1
12/05/85	"	"	***25***	"	***1***
12/20/85	"	"	25	"	1
12/02/85	"	"	25	"	3
12/20/85	"	"	50	"	3
12/20/85	"	"	25	"	3
01/06/86	"	"	25	"	1
04/04/86	"	"	25	"	1
04/04/86	"	"	25	"	1
04/04/86	"	"	25	"	2
07/03/86	Dr. Durkot	"	2.6	"	2
07/03/86	"	"	2.6	"	2
07/25/86	"	"	2.6	"	2
07/25/86	"	"	2.6	"	2
08/27/86	Dr. Dubose	"	23.9	"	1
08/22/86	"	"	25.0	"	3
09/02/86	"	"	2.4	"	2
09/17/86	"	"	13.8	"	2
10/23/86	"	"	3.4	"	2
12/19/86	"	"	3.0	"	2
02/05/87	"	"	22.2	"	3

RAD WASTE INVENTORY LOG

Isotope: H-3 Half-Life: 12.43 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity	Bag No.
02/18/87	Dr. Dubose	"	1.5 µCi	2
02/09/87	"	"	14.9 "	2
02/12/87	"	"	5.9 "	2
04/22/87	"	"	1.0 "	4
04/28/87	"	"	0.8 "	3
05/15/87	"	"	15.5 "	4
05/18/87	"	"	2.62 "	4
07/29/87	"	"	8.3 "	3
08/05/87	"	"	<1.0 "	4
08/05/87	"	"	<1.0 "	3
08/19/87	"	"	1.6 "	3
08/28/87	"	"	1.3 "	3
08/28/87	"	"	1.3 "	3
09/02/87	"	"	14.1 "	4
09/12/87	"	"	18.7 "	3
10/02/87	"	"	<17.0 "	3
10/02/87	"	"	<1.0 "	3
11/24/87	"	"	<0.5 "	4
12/23/87	"	"	<0.5 "	4
04/27/88	"	"	0.006"	4
05/05/88	"	"	0.2 "	4

RAD WASTE INVENTORY LOG

Isotope: H-3 Half-Life: 12.43 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity	Box No.
07/15/88	Dr. Dubose	"	0.5 µCi	4
07/26/88	"	"	<0.21 "	5
05/11/88	"	"	0.5 "	4
08/04/88	"	"	<0.21 "	4
09/08/88	Lombardi	"	0.142"	5
11/04/88	Dr. Cymerman	"	<0.1 "	4
11/14/88	Dr. Dubose	"	<0.06 "	5
12/12/88	"	"	0.8 "	5
07/26/89	"	"	<0.23 "	5
08/04/89	"	"	<0.23 "	6
10/06/89	"	"	0.4 "	5
10/26/89	"	"	<0.6 "	6
04/10/90	Lombardi	"	<1.0 "	5
12/20/89	"	"	2.5 "	6
10/20/89	Dr. Dubose	"	7.6 "	6
10/20/89	"	"	0.4 "	5
11/01/89	"	"	0.254"	6
11/09/89	"	"	0.042"	5
07/19/90	Lombardi	"	<25.0 "	6
07/17/90	Dr. Dubose	"	0.06 "	6
07/17/90	"	"	0.08 "	6
11/19/91	Shukitt	"	10.0 "	9
11/19/91	"	"	20.0 "	8

RAD WASTE INVENTORY LOG

Isotope: H-3 Half-Life: 12.43 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity		Bag No.
11/19/91	Shukitt	"	20.0	µCi	8
11/19/90	"	"	<10.0	"	8
04/02/91	Lombardi	"	0.5	"	8
08/06/91	"	"	0.6	"	8
11/18/91	"	"	0.67	"	8
05/28/92	Arcidiancono	"	4.0	"	8
09/16/93	Dr. Dubose	"	1.0	"	8
09/16/93	"	"	3.0	"	7
09/16/93	"	"	1.0	"	7
09/16/93	"	"	1.0	"	8
09/16/93	"	"	1.0	"	8
09/16/93	"	"	0.06	"	6
05/17/94	Arcidiancono	"	1.35	"	9
03/02/94	Dr. Dubose	"	3.0	"	6
03/01/94	"	"	11.9	"	7
04/04/96	McGrath	"	1000.0	"	
04/05/95	Dr. Mello	"	1.0	"	6
11/05/96	Sieckarski	"	<1.0	"	6
11/05/96	"	"	<1.0	"	9
11/08/96	Lomardi	"	<1.0	"	Contaminated Refrigerated door (2"x18"x24")
11/08/96	"	"	<1.0	"	Contaminated Plexiglass storage box, 10" cube

RAD WASTE INVENTORY LOG

Isotope: H-3 Half-Life: 12.43 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity		
03/07/86	Dr. Dubose	NA	25	µCi	
03/12/86	"	"	25	"	
03/18/86	"	"	25	"	
12/20/85	"	"	25	"	VIALS ?
12/02/85	"	"	25	"	
12/20/85	"	"	50	"	
12/20/85	"	"	25	"	
01/06/86	"	"	25	"	
04/04/86	"	"	25	"	
04/04/86	"	"	25	"	
04/04/86	"	"	25	"	
07/03/86	Dr. Durkot	"	2.6	"	
07/03/86	"	"	2.6	"	
07/25/86	"	"	2.6	"	
07/25/86	"	"	2.6	"	VIALS ?
08/27/86	Dr. Dubose	"	23.9	"	
08/22/86	"	"	25.0	"	
09/02/86	"	"	2.4	"	
09/17/86	"	"	13.8	"	
10/23/86	"	"	3.4	"	
12/19/86	"	"	3.0	"	
02/05/87	"	"	22.2	"	

RAD WASTE INVENTORY LOG

Isotope: H-3 Half-Life: 12.43 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity		
02/18/87	Dr. Dubose	"	1.5	µCi	
02/09/87	"	"	14.9	"	
02/12/87	"	"	5.9	"	
04/22/87	"	"	1.0	"	
04/28/87	"	"	0.8	"	
05/15/87	"	"	15.5	"	
05/18/87	"	"	2.62	"	
07/29/87	"	"	8.3	"	
08/05/87	"	"	<1.0	"	VIALS ?
08/05/87	"	"	<1.0	"	
08/19/87	"	"	1.6	"	
08/28/87	"	"	1.3	"	VIALS ?
08/28/87	"	"	1.3	"	
09/02/87	"	"	14.1	"	
09/12/87	"	"	18.7	"	
10/02/87	"	"	<17.0	"	VIALS ?
10/02/87	"	"	<1.0	"	
11/24/87	"	"	<0.5	"	
12/23/87	"	"	<0.5	"	
04/27/88	"	"	0.006	"	
05/05/88	"	"	0.2	"	

RAD WASTE INVENTORY LOG

Isotope: H-3 Half-Life: 12.43 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity
07/15/88	Dr. Dubose	"	0.5 µCi
07/26/88	"	"	<0.21 "
05/11/88	"	"	0.5 "
08/04/88	"	"	<0.21 "
09/08/88	Lombardi	"	0.142"
11/04/88	Dr. Cymerman	"	<0.1 "
11/14/88	Dr. Dubose	"	<0.06 "
12/12/88	"	"	0.8 "
07/26/89	"	"	<0.23 "
08/04/89	"	"	<0.23 "
10/10/89	"	"	0.4 "
10/26/89	Lombardi	"	<0.6 "
04/10/90	"	"	<1.0 "
12/20/89	"	"	2.5 "
10/20/89	Dr. Dubose	"	7.6 "
10/20/89	"	"	0.4 "
11/09/89	"	"	0.042"
07/19/90	Lombardi	"	<25.0 "
07/17/90	Dr. Dubose	"	0.06 "
07/17/90	"	"	0.08 "
11/19/91	Shukitt	"	10.0 "
11/19/91	"	"	20.0 "

RAD WASTE INVENTORY LOG

Isotope: H-3 Half-Life: 12.43 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity	
11/19/91	Shukitt	"	20.0 µCi	
11/19/90	"	"	<10.0 "	
04/02/91	Lombardi	"	0.5 "	
08/06/91	"	"	0.6 "	
11/18/91	"	"	0.67 "	
05/28/92	Arcidiancono	"	4.0 "	
09/16/93	Dr. Dubose	"	1.0 "	
09/16/93	"	"	3.0 "	
09/16/93	"	"	1.0 "	
09/16/93	"	"	1.0 "	
09/16/93	"	"	1.0 "	
09/16/93	"	"	0.6 "	
05/17/94	Arcidiancono	"	1.35 "	
03/02/94	Dr. Dubose	"	3.0 "	
09/21/94	"	"	11.9 "	5 BAGS?
04/04/96	McGrath	"	1000.0 "	
04/05/96	Dr. Mello	"	1.0 "	
11/05/96	Unknown	"	<1.0 "	
11/05/96	"	"	<1.0 "	
11/08/96	Lomardi	"	<1.0 "	Contaminated Refrigerated door (2"x18"x24")
11/08/96	"	"	<1.0 "	Contaminated Plexiglass storage box, 10" cube

ITEM	ACTIVITY/ ISOTOPE
Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5840A, S/N 2107A08582 ECD Model #18803-60520, S/N C1924	15 mCi Ni-63 November 1984
Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5750 (5754B), S/N 746B01161 ECD Model #2-6195, S/N A755	2 mCi Ni-63
Electron Capture Detector, Gas Chromatograph, Bendix Corp. Model #25621R, S/N 100129 ECD Model #2500 (HP), S/N 18713A	15 mCi Ni-63
Static Electricity Eliminator B.K. Sweeney Mfg. Co. Model #7777	200 mCi H-3 August 1967
Vacuum Gage National Research Corporation Model #58796	275 µgram Ra-226
Vacuum Gage National Research Corporation Model #530 Alphatron	100 µgram Ra-226
Check Source (Plastic Rod)	1.5 µCi Ba-133
Check Source (Cyl. Slug)	0.5 µCi Ba-133
Check Source (Disk)	3.2E-4 µCi Cf-252
Tracerlab Sealed Source w/Pig Cat. No. R-31, S/N B-311	1.2 mCi Co-60 February 1959
Check Source (Disk)	0.0476 µCi Po-210 February 1989
Check Source (Disk)	335 dpm Co-60 February 1997
Check Source (Disk)	45,178 dpm C-14 February 1997
Check Source (Disk)	2.58E5 dps C-14 January 1962

Check Source (Disk)	1.57E3 dps Co-60 January 1962
Check Source (Disk)	3.55E3 dps Tl-204 January 1962
Check Source (Disk)	2.97E3 dps Bi-210 January 1962
Check Source (Disk)	2.25E3 dps Ru-106 January 1962
Check Source (Metal Slug)	848 dpm, Co-60 February 1997
Check Source (Metal Slug)	960 dpm, Co-60 February 1997
Check Source (Plastic Rod)	0.1 μCi Cs-137 October 1977
Check Source (Plastic Rod)	I-129, Packard H-188
Check Source (Plastic Rod)	Cs-137, Packard A-384
Check Source (Plastic Rod)	Cs-137, Packard AB-158
Glass Capsules, Internal Stds.	<2.2 μCi C-14

CHEMICAL WASTE DISPOSAL TAG

Discarded By SAY CARPENTER

Building & Room No. ARIEM Rm 347

Telephone No. 4824

Check appropriate block(s):

- ☐ IGNITABLES
  - ☐ MMABLES
  - ☐ RTIBLES
- ☐ CC
  - ALKALI
  - DIZER
  - TIVE
  - ☐ EXPLOSIVE
- ☐ TOXIC
  - ☐ VOLATILE

Name of Chemical Radioactive WASTE, GARBAGE

CHEMICAL WASTE DISPOSAL TAG

Discarded By DAVE DUBOSSY/MIKE A WATE

Building & Room No. 347 ARIEM

Telephone No. 4824

Check appropriate block(s):

- ☐ IGNITABLES
  - ☐ FLAMM BLES
  - ☐ CC LES
- ☐ CC
  - LI
  - ER
  - VE
  - ☐ EXPLOSIVE
- ☐ TOXIC
  - ☐ VOLATILE

Name of Chemical

CHEMICAL WASTE DISPOSAL TAG

Discarded By D. BOSS/LUKASON

Building & Room No. ARIEM 347

Telephone No. x4824

Check appropriate block(s):

- ☐ IGNITABLE
  - ☐ FL
  - ☐
- ☐ CC
  - ALI
  - ER
  - ☐ XPLOSIVE
  - IC
  - ☐ VOLATILE

Chemical

CHEMICAL WASTE DISPOSAL TAG

Discarded By D. BOSS/LUKASON

Building & Room No. ARIEM 347

Telephone No. 4824

Check appropriate block(s):

- ☐ IGNITABLES
  - ☐ FLA
  - ☐ C
- ☐ CC
  - ALI
  - ER
  - ☐ XPLOSIVE
  - XIC
  - ☐ VOLATILE

Chemical

CHEMICAL WASTE DISPOSAL TAG

Discarded By [illegible]

Building & Room No. ARIEM 347

Telephone No. X 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] CO[illegible]ES
- [ ] [illegible]IZER
- [ ] [illegible]EACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE ^3H
AMOUNT < 0.025 mCi
DATE 4 APRIL 86

Name of Chemical TISSUES, GLOVES AND [illegible]

Bag #1

CAUTION RADIOACTIVE MATERIAL
ISOTOPE H^3
AMOUNT < 0.025 mCi
DATE 10 Dec 85

CHEMICAL WASTE DISPOSAL TAG

Discarded By _____

Building & Room No. _____

Telephone No. _____

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLA[illegible]
  - [ ]
- [ ] [illegible]KALI
- [ ] [illegible]IZER
- [ ] [illegible]ACTIVE
- [ ]

CAUTION RADIOACTIVE MATERIAL
ISOTOPE ^3H
AMOUNT < 0.025 mCi
DATE 7 APRIL 86

Bag #1

[illegible]

Bag #1

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE H^3
AMOUNT <0.025 mCi
DATE 5 Dec 75

CHEMICAL WASTE DISPOSAL TAG

Discarded By Du Bose/Lukason

Building & Room No. Ariem 347

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITAB
  - [ ] F
  - [ ]
- [ ] C
  - [ ] RALI
  - [ ] LER
- [ ]
  - [ ] XPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL

ISOTOPE AMOUNT DATE 3H 26 mCi 6

Name of Chemical

CHEMICAL WASTE DISPOSAL TAG

Discarded By Du Bose/Lukason

Building & Room No. Ariem 347

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABI
  - [ ] FI
  - [ ]
- [ ] CC
  - [ ] ALI
  - [ ] R
  - [ ] LOSIVE
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL

ISOTOPE AMOUNT DATE 3H 26 mCi 6

Na. ical

CHEMICAL WASTE DISPOSAL TAG

Discarded by Joe Carpenter

Building & Room No. Rm 347 US Ariem

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIB
- [ ] CORROSIVE
  - [ ] ACID
  - [ ] B
  - [ ]
- [ ]
  - [ ] L
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL

ISOTOPE AMOUNT DATE 3H 25 mCi 12 Feb 87

Name of Chemical Radioactive Trash

CHEMICAL WASTE DISPOSAL TAG

Discarded by Lukason

Building & Room No. Ariem 34

Telephone No. x4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBU
- [ ] COR
  - [ ]
- [ ] REA TIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL

ISOTOPE AMOUNT DATE 3H 23 mCi 19 Dec 86

Name of Chemical Radioactive Solids

CHEMICAL WASTE DISPOSAL TAG

Discarded By CARPENTER

Building & Room No. AREM Rm 347

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE AMOUNT DATE

Name of Chemical RADIOACTIVE WASTE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded By [illegible]

Building & Room No. AREM 347

Telephone No. X 4824

Check appropriate block(s):

- [ ] IGNITAB'
  - [ ] F
  - [ ]
- [ ] C
  - [ ] ALI
  - [ ] ER
- [ ] R
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE AMOUNT DATE

Name of Chemical RADIOACTIVE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded By SP4 CARPENTER

Building & Room No. USAREM Rm 347

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] AMMABLES
  - [ ] TIBLES
- [ ] ALKALI
  - [ ] IZER
  - [ ] IVE
  - [ ] EXPLOSIVE
- [ ] OXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE AMOUNT DATE

Name of Chemical RADIOACTIVE [illegible]

CHEMICAL WASTE DISPOSAL TAG

Discarded by SP4 CARPENTER

Building & Room No. Rm 347 USAREM

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ]
- [ ] ALKALI
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE AMOUNT DATE

Name of Chemical RADIOACTIVE TRASH

Bag #1

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE H_3
AMOUNT < 2.4 uCi
DATE 12 Sep 86

04/23/86

CHEMICAL WASTE DISPOSAL TAG

Discarded By Carpenter
Building & Room No. Rm 342
Telephone No. 4824

Check appropriate block(s):

- ☐ IGNITABLES
  - ☐ FLAMMABLES
  - ☐ [illegible]
- ☐ OXIDIZER
- ☐ REACTIVE
  - ☐ EXPLOSIVE
- ☐ TOXIC
  - ☐ VOLATILE

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE 3H
AMOUNT < 3.4 uCi
DATE 23 Oct 86

Name of Chemical 10/23/86
Radioactive Trash

Bag # 2

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE 3H
AMOUNT < 25 uCi
DATE 11/1/86

CHEMICAL WASTE DISPOSAL TAG

Discarded by Dr Dubose

Building & Room No. USARIEM #347

Telephone No. X 4824

Check appropriate block(s):

- [ ] IGNITABLES
- [ ] FLAMMABLES
- [ ] BASE/ALKALI
- [ ] OXIDIZER
- [ ] REACTIVE
- [ ] EXPLOSIVE
- [ ] TOXIC
- [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE 3H
AMOUNT < 16.7 uCi
DATE 17 Sept 87

Name of Chemical SOLID WASTE -3H

CHEMICAL WASTE DISPOSAL TAG

Discarded By Dr. Dubose

Building & Room No. ARIEM Rm 3

Telephone No. X 4824

Check appropriate block(s):

- [ ] IGNITABLES
- [ ] FLAMMABLES
- [ ] COMBUSTIBLES
- [ ] CORROSIVE
- [ ] REACTIVE
- [ ] EXPLOSIVE
- [ ] TOXIC
- [ ] VOLATILE

SOLID Waste

CAUTION RADIOACTIVE MATERIAL
ISOTOPE 3H
AMOUNT < 1.6 uCi
DATE 19 Aug

Name of Chemical

CHEMICAL WASTE DISPOSAL TAG

Discarded by LUKASON

Building & Room No. ARIEM 347

Telephone No. X 4824

Check appropriate block(s):

- [ ] IGNITABLES
- [ ] FLAMMABLES
- [ ] COMBUST
- [ ] CORROSIV
- [ ] ACI
- [ ] F
- [ ] H
- [ ] EX E
- [ ] TOXIC
- [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE 3H
AMOUNT < 0.7 uCi
DATE 28 April 87

Name of Chemical RADIOACTIVE SOLID WASTE

CHEMICAL WASTE DISPOSAL TAG

Discarded By SPY Carpenter

Building & Room No. Rm 347 USARIEM

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
- [ ] BASE/ALKALI
- [ ] OXIDIZER
- [ ] REACTIVE
- [ ] EXPLOSIVE
- [ ] TOXIC
- [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE H3
AMOUNT < 1.8 uCi
DATE 28 Aug 87

Name of Chemical RADIOACTIVE WASTE (TRASH)

CHEMICAL WASTE DISPOSAL TAG

Discarded By Luxason/DuBose

Building & Room No. Rm 347

Telephone No.

Check appropriate

☐ IGN

☐ S

BLES

☐

CAUTION RADIOACTIVE MATERIAL

ISOTOPE AMOUNT DATE

ALKALI

ZER

E

PLOSIVE

VOLATILE

CAUTION RADIOACTIVE MATERIAL

ISOTOPE AMOUNT DATE

Name of Chemical

CHEMICAL WASTE DISPOSAL TAG

Discarded by Dave Dubose

Building & Room No. USARIEM Rm 347

Telephone No. X 4824

Check appropriate block(s):

☐ IGNITABLES

☐ FLAMMABLES

☐ COMBUSTIBLES

☐ CORROSIVE

CAUTION RADIOACTIVE MATERIAL SOLID

ISOTOPE AMOUNT DATE 6 Aug 87

☐ REACTIVE

☐ EXPLOSIVE

☐ TOXIC

☐ VOLATILE

Name of Chemical

CHEMICAL WASTE DISPOSAL TAG

Discarded by Carpenter

Building & Room No. USARIEM Rm 347

Telephone No. X 4824

Check appropriate block(s):

☐ IGNITABLES

☐ FLAMMABLES

☐ COMBUSTIBLES

☐ CORROSIVE

CAUTION RADIOACTIVE MATERIAL

ISOTOPE AMOUNT DATE

☐

☐ EXPLOSIVE

☐ TOXIC

☐ VOLATILE

Name of Chemical Radioactive SOLID

CHEMICAL WASTE DISPOSAL TAG

Discarded By Dave Dubose

Building & Room No. USARIEM Rm 347

Telephone No. 4824

Check appropriate block(s):

☐ IGNITABL

☐ F ES

☐

☐ C

CAUTION RADIOACTIVE MATERIAL

ISOTOPE AMOUNT DATE

KALI

ZER

E

EXPLOSIVE

☐ TOXIC

☐ VOLATILE

Name of Chemical Radioactive TRASH

Bag #3

CAUTION
RADIOACTIVE
MATERIAL

ISOTOPE 3H
AMOUNT <0.025mCi
DATE 2 Dec 85

CHEMICAL WASTE DISPOSAL TAG

Discarded by Dr Dave Dubose

Building & Room No. US+2.4m Rm 34

Telephone No. X 4824

Check appropriate block(s):

- [ ] IGNITABLES
- [ ] FLAMMABLES

CAUTION
RADIOACTIVE
MATERIAL

ISOTOPE 3H
AMOUNT <0.025mCi
DATE 2 Oct 87

- [ ] OXIDIZER
- [ ] REACTIVE SOLID
- [ ] EXPLOSIVE WASTE
- [ ] TOXIC
- [ ] VOLATILE

Name of Chemical _____

Bag #3

Dr Dave
CAUTION
RADIOACTIVE
MATERIAL

ISOTOPE H3
AMOUNT <0.025mCi
DATE 2 Dec 85

Bag #3

CAUTION
RADIOACTIVE
MATERIAL

ISOTOPE
AMOUNT
DATE

CHEMICAL WASTE DISPOSAL TAG

Discarded by SPC Carpenter

Building & Room No. USA 2150 Rm 387

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
- [ ] CAUTION RADIOACTIVE MATERIAL
  ISOTOPE H3
  AMOUNT ≤ 2 mCi
  DATE 8 May 87
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

Name of Chemical RADIOACTIVE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded by SPC Carpenter

Building & Room No. USA 2150 Rm 387

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
- [ ] CAUTION RADIOACTIVE MATERIAL
  ISOTOPE H3
  AMOUNT < 5 mCi
  DATE 5 May 87
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

Name of Chemical RADIOACTIVE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded by SPC Carpenter

Building & Room No. Rm 347 USA 2150

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
- [ ] CAUTION RADIOACTIVE MATERIAL
  ISOTOPE H3
  AMOUNT < 5 mCi
  DATE 23 Dec 87
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

Name of Chemical RADIOACTIVE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded By SPC Carpenter

Building & Room No. USA 2150 Rm 347

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
- [ ] CAUTION RADIOACTIVE MATERIAL
  ISOTOPE H3
  AMOUNT ≤ 5 mCi
  DATE 10 May 87
  - [ ] ACID
  - [ ] BASE/ALKALI
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

Name of Chemical RADIOACTIVE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded by USARIEM Cold

Building & Room No. 142 Rm 347

Telephone No. x 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLE
  - [ ] COMBUS
- [ ] CORROSI
  - [ ] AC
  - [ ]
  - [ ]
- [ ] REACTIV
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE 3H
AMOUNT 6 1 uCi
DATE 22 APR 87

DRY WASTE

Name of Chemical 3H

CHEMICAL WASTE DISPOSAL TAG

Discarded by Guzman, J.

Building & Room No. USARIEM Rm 3

Telephone No. x 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
- [ ] CO
  - [ ]
  - [ ]
  - [ ]
- [ ] REACTIVE SOLID
  - [ ] EXPLOSIVE WASTE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE 3H
AMOUNT 6 1 uCi
DATE 5 AUG 87

Name of Chemical

CHEMICAL WASTE DISPOSAL TAG

Discarded by SP4 Carpenter

Building & Room No. USARIEM Rm347

Telephone No. x4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
- [ ]
  - [ ] BASE/ALKALI
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE H2
AMOUNT 5 [illegible]
DATE 24 Nov 87

Name of Chemical RADIOACTIVE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded by SP4 Robert Carpenter

Building & Room No. USARIEM 34

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
- [ ]
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE
AMOUNT <.21 uCi
DATE 4 Aug 88

Name of Chemical RADIOACTIVE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded by Dubose

Building & Room No. USARIEM Rm 347

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES SOLID
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
- [ ] CAUTION RADIOACTIVE MATERIAL ISOTOPE 3H AMOUNT .52 DATE 11 May 88
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

Name of Chemical _____

CHEMICAL WASTE DISPOSAL TAG

Discarded By SP4 CARPENTER

Building & Room No. USARIEM Rm 347

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
- [ ] CAUTION RADIOACTIVE MATERIAL ISOTOPE H3 AMOUNT <.006 DATE 27 APR 88
  - [ ] BASE/AL...
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

Name of Chemical RADIOACTIVE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded By SP4 CARPENTER

Building & Room No. USARIEM Rm 347

Telephone No. x 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
- [ ] CAUTION RADIOACTIVE MATERIAL ISOTOPE H3 AMOUNT <14.1 DATE 25 Jan 87
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

Name of Chemical RADIOACTIVE TRASH

CHEMICAL WASTE DISPOSAL TAG

Discarded by Dubose

Building & Room No. USARIEM Rm 3

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
- [ ] CAUTION RADIOACTIVE MATERIAL ISOTOPE H3 AMOUNT 7.3 DATE 4 May 88
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

Name of Chemical _____

Bag #4

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE
AMOUNT
DATE
CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE
AMOUNT
DATE

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: DuBose
DIRECTORATE: USARIEM
BLDG/RM#: 347
PHONE#: 4824
CHEMICAL NAME H^3

PURP

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE H3
AMOUNT 0.4 µCi
DATE 20 OCT 89

PH-R

% O

SIGNATURE:
David A. DuBose

(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: Robert CARPENTER
DIRECTORATE: USARIEM
BLDG/RM#: 347
PHONE#: 4824
CHE

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE H3
AMOUNT .042 µCi
DATE 9 JUL 89

PUR

PH-RANGE

% OF ELEMENTS
RADIOACTIVE TRASH

SIGNATURE:

STICK LABEL

(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: S Lamberdi
DIRECTORATE: SSD
BLDG/RM#: D320
PHONE#: 4983
CHEMICAL NAME
^3H-acetic Anhydride
PURPOSE: date 4-10-90
conc: ≤ 1 µCi

PH-RANGE

% OF ELEMENTS

SIGNATURE: S Lamberdi

STICK LABEL

(PRINT ALL INFORMATION)

HW # _____

[redacted]

DISCARDED BY:
NAME: CARPENTER
DIRECTORATE: USARIEM
BLDG/RM#:
PHONE#:
CHI

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE H3
AMOUNT > .4 µCi
DATE 6 OCT 89

PUR

PH-RANGE

% OF ELEMENTS

RADIOACTIVE
TRASH

SIGNATURE:

STICK LABEL

(PRINT ALL INFORMATION)

CHEMICAL WASTE DISPOSAL TAG

Discarded by SGT Carpenter

Building & Room No. USARIEM 347

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] COMBUSTIBLES
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE H_3
AMOUNT < 21 mi
DATE 26 July 88

Name of Chemical Radioactive Trash

CHEMICAL WASTE DISPOSAL TAG

Discarded by SGT Carpenter

Building & Room No. USARIEM 347

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE H_3
AMOUNT < 2.3 mi
DATE 26 July 88

Name of Chemical Radioactive Trash

CHEMICAL WASTE DISPOSAL TAG

Discarded by SGT Carpenter

Building & Room No. Rm 347 USARIEM

Telephone No. 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE H_3
AMOUNT < 0.5 mi
DATE 14 Nov 88

Name of Chemical Radioactive Trash

CHEMICAL WASTE DISPOSAL TAG

Discarded by Dr Dave Dubose

Building & Room No. USARIEM 347

Telephone No. X 4824

Check appropriate block(s):

- [ ] IGNITABLES
  - [ ] FLAMMABLES
  - [ ] BASE/ALKALI
  - [ ] OXIDIZER
- [ ] REACTIVE
  - [ ] EXPLOSIVE
- [ ] TOXIC
  - [ ] VOLATILE

CAUTION RADIOACTIVE MATERIAL
ISOTOPE H_3
AMOUNT 0.14 mi
DATE 27 OCT 88

< 0.142 pli

SOLID WASTE

Name of Chemical H_3

Bag 5

CHEMICAL WASTE DISPOSAL TAG

Discarded by [illegible]

Building & Room No. [illegible]

Telephone No. [illegible]

Check appropriate block(s):

- [ ] IGNITABLES
- [ ] [illegible]
- [ ] BASE/ALKALI
- [ ] OXIDIZER
- [ ] REACTIVE
- [ ] EXPLOSIVE
- [ ] TOXIC
- [ ] VOLATILE

CAUTION
RADIOACTIVE
MATERIAL

ISOTOPE H_2
AMOUNT [illegible]
DATE [illegible]

Name of Chemical [illegible]

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: J. LOMBARDI
DIRECTORATE: SSD
BLDG/RM#: D320
PHONE#: 4983
CHEMICAL NAME
3H
PURPOSE:
DISPOSAL
PH-RANGE
% OF ELEMENTS
USED · 11·29·89
Disposed - 12·26·89
SIGNATURE:
AMT: 2.5 µCi
STICK LABEL
(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: ~~USARIEM~~ CARPENTER
DIRECTORATE: USARIEM
BLDG/RM#: 347
PHONE#: 4824
CHEMICAL NAME
CAUTION RADIOACTIVE MATERIAL
ISOTOPE H3
AMOUNT <.06 µCi
DATE 26 OCT 89
PU
PH-
% OF ELEMENTS
RADIOACTIVE TRASH
SIGNATURE:
STICK LABEL
(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: CARPENTER
DIRECTORATE: USARIEM
BLDG/RM#: 347
PHONE#: 4824
CHEMICAL NAME
RADIOACTIVE TRASH
PURPOSE:
CAUTION RADIOACTIVE MATERIAL
ISOTOPE H3
AMOUNT 2.259 µCi
DATE 1 NOV 89
SIGNATURE:
STICK LABEL
(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: DuBose
DIRECTORATE: USARIEM
BLDG/RM#: 347
PHONE#: 4824
CHEMICAL NAME H3
CAUTION RADIOACTIVE MATERIAL
ISOTOPE H3
AMOUNT 7.6 µCi
DATE 20 OCT 89
PU
PH
% OF ELEMENTS
SIGNATURE:
David DuBose
(PRINT ALL INFORMA

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: D. MOREHOUSE
DIRECTORATE: USARIEM
BLDG/RM#: 42
PHONE#: 4824
CHEMICAL NAME H_3

PURPOSE: RIA
4/29/93 (9/16/93
PH-RANGE
% OF ELEMENTS
LESS THAN 0.055 µCi

SIGNATURE: D. Morehouse

STICK LABEL

(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME:
DIRECTORATE: USARIEM EPI
BLDG/RM#: 42/347
PHONE#: 4824
CHEMICAL NAME TRITIUM

PURPOSE: RIA

PH-RANGE
% OF ELEMENTS 3µCi
3/2/94 3µCi

SIGNATURE:

STICK LABEL

(PRINT ALL INFORMATION)

Bag #5

CAUTION RADIOACTIVE MATERIAL TRASH
ISOTOPE H_3
AMOUNT .07 µCi
DATE 12 July 90

Bag #6

CAUTION RADIOACTIVE MATERIAL
ISOTOPE
AMOUNT
DATE
HTR 19 July 90

CAUTION RADIOACTIVE MATERIAL
ISOTOPE
AMOUNT
DATE
1.25 µCi

CAUTION RADIOACTIVE MATERIAL
ISOTOPE
AMOUNT
DATE

Bag #6

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE
AMOUNT
DATE

Bag #6

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE
AMOUNT
DATE

Bag #6

^{3}H WASTE - 1 Ci

4-5-95

Bag 6

CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE
AMOUNT
DATE

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: DuBoos
DIRECTORATE:
BLDG/RM#:
PHONE#:
CHEMICAL NAME Tritium
PURPOSE: 3H 11.9uCi
PH-RANGE Total
% OF ELEMENTS 5 Bags
12/31/93
3/1/94
SIGNATURE:

STICK LABEL

(PRINT ALL INFORMATION)

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: Morehouse
DIRECTORATE:
BLDG/RM#:
PHONE#:
CHEMICAL NAME H3
PURPOSE:
PH-RANGE 9/14/93
% OF ELEMENTS
LESS THAN
SIGNATURE: 3uCi

STICK LABEL

(PRINT ALL INFORMATION)

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: OGLE
DIRECTORATE: EPP
BLDG/RM#: 42/347
PHONE#: 4824
CHEMICAL NAME ^3H
PURPOSE: 9/14/93
PH-RANGE
% OF ELEMENTS < 1 uCi
SIGNATURE:
Patricia L. Ogle

STICK LABEL

(PRINT ALL INFORMATION)

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:

NAME: S. ARCIDIACONO

DIRECTORATE: SSD

BLDG/RM#: D320

PHONE#: 5510

CHEMICAL NAME

3H

PURPOSE: DISPOSAL

4-2-91

PH-RANGE

% OF ELEMENTS

0.5 uCi

SIGNATURE: Steven Arcidiacono

STICK LABEL

(PRINT ALL INFORMATION)

HW #

11/21/91

HAZARDOUS WASTE TAG

DISCARDED BY:

NAME: Barbara Shukit Hale

DIRECTORATE: ARIEM - OPS

BLDG/RM#: 216

PHONE#: 4195

CHEMICAL NAME

3H (tritium)

PURPOSE:

PH-RANGE

% OF ELEMENTS

< 10 µCi tritium

SIGNATURE: Barbara Shukit Hale

STICK LABEL

(PRINT ALL INFORMATION)

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:

NAME: S. ARCIDIACONO

DIRECTORATE: SSD

BLDG/RM#: D320

PHONE#: 4983

CHEMICAL NAME

3H acetyl glucosamine

PURPOSE:

5/28/92

PH-RANGE

% OF ELEMENTS

40 uCi

SIGNATURE:

STICK LABEL

(PRINT ALL INFORMATION)

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:

NAME: Steven Arcidiacono

DIRECTORATE: SSD

BLDG/RM#: D320

PHONE#: 5510

CHEMICAL NAME

3H glucosamine

PURPOSE:

PH-RANGE

% OF ELEMENTS

0.6 uCi

8-6-91

SIGNATURE:

STICK LABEL

(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: MOREHOUSE
DIRECTORATE: USARIEM
BLDG/RM#:
PHONE#: 4824
CHEMICAL NAME H^3

PURPOSE:
< 1 uCi

~~PH-RANGE~~
~~% OF ELEMENTS~~
9/14/93

SIGNATURE:
STICK LABEL
(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: OGLE
DIRECTORATE: EPP / USARIEM
BLDG/RM#: 42 / 3#7
PHONE#: 4824
CHEMICAL NAME 3H

PURPOSE:
9/14/93

PH-RANGE
% OF ELEMENTS < 1 uCi

SIGNATURE: Patricia L. Ogle
STICK LABEL
(PRINT ALL INFORMATION)

HW #

HAZARDOUS

DISCARDED BY:
NAME: Barbara Shukitt-Hale
DIRECTORATE: OPS
BLDG/RM#: 216 ARIEM
PHONE#: 4195
CHEMICAL NAME
3H Rubber waste

PURPOSE: autoradiography
9/93

PH-RANGE
% OF ELEMENTS
20 uCi tritium

SIGNATURE: Barbara Shukitt-Hale
STICK LABEL
(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: MOREHOUSE
DIRECTORATE: USARIEM
BLDG/RM#:
PHONE#: 4824
CHEMICAL NAME H^3

PURPOSE:
< 1 uCi

~~PH-RANGE~~
~~% OF ELEMENTS~~
9/14/93

SIGNATURE:
STICK LABEL
(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:

NAME: S. ARCIPIACENO

DIRECTORATE: SED

BLDG/RM#: D820

PHONE#: 4983

CHEMICAL NAME

^{3}H glycol chitin

PURPOSE: U dry wast.

PH-RANGE

% OF ELEMENTS

0.67 μCi

SIGNATURE:

STICK LABEL

(PRINT ALL INFORMATION)

HW # _____

HAZARDOUS WASTE TAG

DISCARDED BY:

NAME: Barbara Shukitt H

DIRECTORATE: OPS

BLDG/RM#: 216 ARIEM

PHONE#: 4195

CHEMICAL NAME

^{3}H - Glass Waste

PURPOSE: autoradiography

PH-RANGE N/A

% OF ELEMENTS

[illegible] μCi tritium

SIGNATURE: Barbara Shukitt H

STICK LABEL

(PRINT ALL INFORMATION)

Bag #9

1 uCi

11/08/96

John S.

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:

NAME: Barbara Shuk Hale

DIRECTORATE: OPS

BLDG/RM#: ARIEM 216

PHONE#: 4195

CHEMICAL NAME

^3H paper waste

PURPOSE: autoradiography

PH-RANGE 11/19/91

% OF ELEMENTS

10 uCi tritium

SIGNATURE: Barbara Shuk Hale

STICK LABEL

(PRINT ALL INFORMATION)

Rad. Waste Log

[illegible]	Date	Name or Lab	Ext.	Isotope + Amount		Remarks
[illegible]	1-6-86	Dubose	4267	3H	25 µci	Vials
	1-[illegible]-86		"	3H	25 µci	Vials
8	3-7-86	Dubose	4267	3H	25 µci	Vials
[illegible]	"	"	4267	3H	25 µci [illegible]	([illegible]) [illegible]
9	3-7-86	Dubose	4267	3H	25 µci	Solid
9	3-[illegible]	"	4267	3H	25 µci	Solid
8	"	"	"		"	Vials
	"	"			25 µci [illegible]	[illegible]
9	3-17-86	Dunlap	4877	7C	1 µci	Solid
	"	"	"	"	1 µci	Solid
9	3-18-86	Dubose (6 Dec. 85)	4267	3H	25 µci	Solid
8	20 Dec. 85	Dubose	4267	3H	25 µci	Vials
7	20 Dec. 85	Dubose	4267	3H	25 µci	Solid
7	20 Dec. 85	"	4267	3H	50 µci	Solid
9	20 Dec. 85	Dubose	4267	3H	25 µci	Solid
9	6 [illegible]	"	"	3H	25 µci	Solid
	4-1-86	Kramer	4877	.25 I	2.66 µci	Solid [illegible]
	4-3-86	"	"	"	5.32 µci	" [illegible]
	4-8-86	"	"	"	5.32 µci	" "
	4-14-86	"	"	"	5.32 µci	" "
	4-14-86	"	"	.25 I	6.65 µci	4-15-86 Solid [illegible]
	4-[illegible]-86	"	"	.25 I	2.92 µci	Solid [illegible]
	4-30-86	Kramer	"	.25 I	2.[illegible] µci	Solid [illegible]
	5-[illegible]	Kramer	"	.25 I	[illegible]	[illegible]
	[illegible]	[illegible]	"	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Rad. Waste Log

Item #	Date	Name or Lab	Ext.	Isotope / Amount	Remarks
	5-6	[illegible]	[illegible]	^{125}I 2.0-2.0 μCi	Solid
	5-6			1.0-2.0 μCi	
	5-16		[illegible]	^{125}I Bag 4 μCi	Solid
	5-16-86	Lewis		^{125}I 2 μCi 4 μCi	Solid
	5-21-86	Jones	4877	^{125}I 4.33	Solid
	5-23-86	Lewis	4877	^{125}I 2 μCi 15.6 μCi 1 μCi	Solid
	6-9-86	Hamer	4878	^{125}I 2.27 μCi	Solid
	6-16-86	Hamer	4878	^{125}I 5.25 μCi	Solid
	7-9-86	"	4878	^{125}I 2.5 μCi	Solid
	7-1-86	"	4878	^{125}I 3.3 μCi	Solid
9	4-4-86	Dubose	4868	^{3}H 25 μCi ^{3}H 25 μCi ^{3}H 25 μCi	Solid
	4-4-86	Dubose	4868	^{3}H 25 μCi	Aqueous
8	4-4-86	Dubose	"	^{3}H 25 μCi	Vial
8	7-4-86	"	"	^{3}H 25 μCi	Vial
	7-4-86	Cypressmen Chemical		^{3}H 305 μCi ^{14}C 300 μCi	Solid
9	7-3-86	Dubose	4868	^{3}H 0.6 ^{3}H 0.6 μCi	Solid
8	7-3-86	Dubose	4868	^{3}H 0.6 μCi	Sand
8	7-25-86	Dubose	4868	^{3}H 25 μCi	Aqueous
8	7-25-86	"	"	^{3}H 2.6 μCi	Solid
8	7-25-86	"	"	^{3}H 26 μCi	Vial
	8-8-86	Hamer	4878	^{125}I 1.0 μCi .5 μCi	Solid
8	8-25-86	Dubose	4868	^{3}H 25.5 μCi	Vial
8	8-27-86	Dubose	4868	^{3}H 12.5 μCi	Vial
8	8-27-86	Dubose	4868	^{3}H 25.5 μCi	Vial
8	8-27-86	Dubose	4868	^{3}H 25 μCi	Vial
8	8-27-86	Dubose	4868	^{3}H 25 μCi	Vial
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Rad. Waste Log

Date	Name or Lab	Exp	Isotope & Amount	Remarks
10/5/84	Trent	4880	^{125}I <[illegible]	Solid
10/30/84	Mamer	4839	^{125}I 2.2μci 2.7μci	Solid
[illegible]	[illegible]	[illegible]	^{125}I [illegible]	[illegible]
[illegible]	Mamer	[illegible]	^{125}I [illegible]	Solid
[illegible]	Trent	4880	^{125}I 8.0μci	Solid
[illegible]	Dubow	4834	^{3}H 3.4μci	Drain <.05μci
9/24/84	Dubow	4834	^{3}H 3.4μci	Solid
9/26/84	"	"	^{3}H 13.8μci	"
10/30/84	Dubow	4834	^{3}H 3.4μci	Solid
9/12/84	"	"	^{3}H 3.4μci	Liq.
9/17/84		"	" 33.8μci	"
10/2/84	Dubow	4834	^{3}H 3.4μci	Liq.
[illegible]	[illegible]	4829	^{125}I [illegible]	Solid
10/30/84	Trent	4880	^{125}I (Gyμci) = 1.0μci	Drain <.05μci/ml
10/30/84	Trent	4880	^{125}I (Liq) = .335μci	Drain <.05μci/ml
10/30/84	"	"	^{125}I (Liq) = .145μci	Drain <.001μci/ml
10/30/84	Lara	4877	^{125}I 2.0μci	Solid
"	"	"	^{125}I 2.0μci	"
"	"	"	^{125}I < 2.0μci	"
10/30/84	Lara	4877	^{125}I 1.0μci	Solid
[illegible]	[illegible]	[illegible]	^{125}I [illegible]	Solid
[illegible]	Dubow	4877	^{125}I [illegible]	Solid
[illegible]	[illegible]	[illegible]	^{125}I 5.4μci	Solid
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Rad. Waste Log

[illegible]	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
9	2/[illegible]/87	Dubois	4824	3H 14.9 pcs	Solid
9	2/12/87	"	"	3H 5.9 pcs	Solid
9	2/18/87	Dubois	4824	3H 1.5 pcs	Solid
	12/[illegible]/87	"	4824	3H 3 pcs 4/[illegible]/87	Drain [illegible]
	2/5/87	"	"	3H 22.2 pcs 4/7/87	Drain [illegible]
	2/9/87	"	"	3H 14.9 pcs 4/8/87	Drain [illegible]
	2/12/87	"	"	3H 5.9 pcs 4/9/87	Drain [illegible]
	2/18/87	"	4824	3H 7.5 pcs 4/10/87	Drain [illegible]
	12/[illegible]/87	"	4824	3H 3 pcs	Vials
	2/5/87	"	"	3H 5 pcs	Vials
	2/9/87	"	"	3H 14.9 pcs	Vials
	2/12/87	"	"	3H 5.9 pcs	Vials
	2/18/87	"	"	3H 7.5 pcs	Vials
	4/[illegible]/87	[illegible]	4824	125I 8.9 pcs	Solid
	4/[illegible]/87	Dubois	[illegible]	125I 10 pcs	Drain [illegible]
	4/[illegible]/87	[illegible]		125I 7.5 pcs	Solid
	4-16/87	[illegible]		Nat U. 0.5 pcs	Solid
	[illegible]	Dubois	[illegible]	3H 1.0 pcs	Solid
	"	"	"	3H [illegible]	Vials
	[illegible]	Dubois	[illegible]	3H [illegible]	Drain [illegible]
	[illegible]	Dubois	[illegible]	3H [illegible]	Solid
	"	"	"	" [illegible]	Vials
	[illegible]	Dubois	[illegible]	3H [illegible]	Drain [illegible]
	4/7/87	[illegible]	[illegible]	[illegible]	Solid
	[illegible]	[illegible]	[illegible]	[illegible]	Solid

Rad. Waste Log

[illegible]	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
	[illegible]	Dubose	4827	3H 15.5 pci	Drain [illegible]
8	[illegible]	Dubose	"	3H [illegible]	Solid
	[illegible]	"	"	3H 2.6[illegible] pci	Vials
	5/[illegible]/87	Fred	4987	125I <2 pci	Solid
	6/9/87	Kramer	4879	125I 5.[illegible] pci	Solid
	6/9/87	Kramer	4892	125I 3.56 pci [illegible]	Solid
	[illegible]	[illegible]	[illegible]	[illegible]	Solid
	[illegible]	Kramer	[illegible]	125I 8.[illegible] pci	Solid
	[illegible]	Kramer	[illegible]	125I [illegible] pci	Solid
	[illegible]	Kramer	[illegible]	125I 4.62 pci	Solid
	[illegible]	Kramer	[illegible]	125I [illegible]	Solid
3	5/15/87	Dubose	4824	3H 15.5 pci	Solid
3	8/8/87	"	4824	3H 2.62 pci	Solid
	7/29/87	Dubose	4824	3H 8.3 pci	Drain [illegible]
8 (2)	"	"	"	3H "	Vials
3	"	"	"	3H 8.3 pci	Solid
	8/5/87	Dubose	4824	3H <1.9 pci	Drain [illegible]
8 (2)	"	"	"	3H <1.0 pci	Vials
3	"	Dubose	4824	3H <1.0 pci	Solid
	8/17/87	Dubose	4824	3H <1.6 pci	Drain [illegible]
8 (2)	"	"	"	" "	Vials
3	"	Dubose	4824	3H <1.6 pci	Solid
	[illegible]	Dubose	4824	3H 1.3 pci	Drain [illegible]
8 (2)	"	"	"	" "	Vials
3	[illegible]	Dubose	4824	3H 1.3 pci	Solid
	[illegible]	Dubose	4824	3H [illegible]	Drain [illegible]
[illegible]	"	"	"	" "	Vials
	[illegible]	Dubose	[illegible]	[illegible]	[illegible]

Rad. Waste Log

Item #	Date	Name or Lab	Ext	Isotope + Amount	Remarks
	7/1/87	Dubose	4834	^{3}H [illegible]	Drum composite
2	"	"	"	^{3}H 18 pCi	Wet
3	7/1/87	Dubose	4834	^{3}H 18 pCi <1.0 pCi	Solid
	8/1/87	[illegible]	4877	^{125}I <1.0 pCi <1.0 pCi	Solid
	8/26/87	Lola	4877	^{125}I <1.0 pCi <1.0 pCi	Solid
	9/1/87	Kramer	4877	^{125}I 6.83 pCi <1.0 pCi	Solid
	9/3/87	"	"	" 4 pCi (<1.0 pCi)	"
	9/9/87	"	"	" 6.48 pCi (<1.0 pCi)	"
	9/29/87	"	4877	^{125}I 2.13 pCi	Solid
	9/22/87	Dubose	4834	^{3}H 0.3 pCi	Drum composite
2	10/1/87	Dubose	4834	^{3}H <10.0 pCi	Wet
	"	"		^{3}H <1.0 pCi	Solid
	10/29/87	Dubose	4834	^{3}H <1.0 pCi	Drum composite
	11/11/87	Silberman	4877	^{125}I [illegible]	[illegible]
	11/20/87	Frank	4877	^{125}I <40 pCi 5/1/86	<0.2 pCi Solid
	11/23/87	Lola	4877	^{125}I <1 pCi 0.2 pCi <1 pCi <1 pCi <1 pCi	Solid
	11/[illegible]	Harvey	4877	^{125}I [illegible] pCi	Solid
	11/[illegible]	Harvey	4877	^{125}I [illegible]	Solid
	12/1/87	"	"	^{125}I 8.83 pCi	Solid
2	11/[illegible]	Dubose	4834	^{3}H 22.6 pCi	Wet
3 2	11/24/87	Dubose	4834	^{3}H <2.5 pCi	Solid
	11/[illegible]	Dubose	4834	^{3}H <2.0 pCi	Drum composite
3	11/24/87	Dubose	4834	^{3}H 22.6 pCi	Wet
3	11/24/87	"	"	" <2.5 pCi	Solid
	11/24/87	Dubose	4834	^{3}H <2.0 pCi	Drum composite
	11/24/87	Kramer	4877	^{125}I 8.83 pCi	Solid
	[illegible]	[illegible]	[illegible]	^{125}I [illegible]	[illegible]

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
1	3-[illegible]-84	Kaczmar	4837	^{125}I 3.33 pCi	Solid
	[illegible]	"	[illegible]	^{125}I [illegible]	Solid
2	4-22-84	Dubose	4824	^{3}H 0.27 pCi	Water
	"		4824	^{3}H 0.024 pCi	Drain [illegible]
3	"	Dubose	4824	^{3}H ~~[illegible]~~ .006 pCi	Solid
3	5-5-84	Dubose	4824	^{3}H 0.2 pCi	Solid
	"	Dubose	4824	^{3}H <0.9 pCi	Drain [illegible]
2	5-5-84	Dubose	4824	^{3}H 10.1 pCi	Wash
	[illegible]	Dubose	4824	^{3}H [illegible]	Drain [illegible]
	[illegible]	[illegible]	[illegible]	^{125}I [illegible]	[illegible]
	7-[illegible]-84	Pearr	4837	^{125}I 4 pCi 2 pCi	Solid
	[illegible]	Pearr	4837	^{125}I 4 pCi	Solid
	[illegible]	[illegible]	[illegible]	^{125}I [illegible]	Solid
	7-[illegible]-84	[illegible]	[illegible]	^{125}I [illegible]	Solid
	[illegible]	[illegible]	[illegible]	^{125}I [illegible]	Solid
3	7-18-84	Dubose	4824	^{3}H [illegible]	Solid
	"	Dubose	"	^{3}H 1.9 pCi	Drain [illegible]
2	[illegible]	Dubose	4824	^{3}H [illegible]	Water
3	7-[illegible]-84	Dubose	4824	^{3}H <.21 pCi	Solid
2	7-[illegible]-84	"	"	^{3}H 9.45 pCi	Water
	7-[illegible]-84	Dubose	4824	^{3}H <.84 pCi	Drain [illegible]
	[illegible]	Dubose	[illegible]	^{3}H [illegible]	Solid
	[illegible]	Dubose	[illegible]	^{3}H [illegible]	[illegible]
3	8-4-84	Dubose	"	^{3}H <.21 pCi	Solid
	"	"	"	^{3}H <.84 pCi	Drain [illegible]
2	8-4-84	Dubose	4837	^{3}H 9.45 pCi	Wash

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
3	9-8/88	Lombardi	4883	^3H .00125 μCi [illegible]	Solid
3	10-22-88	Dubois	4834	^3H 0.14 μCi	Solid [illegible]
2	"	"	"	^3H 5.07 μCi	Vials
	~~"~~	~~Dubois~~	~~4834~~	~~^3H 0.0[illegible] μCi~~	~~Drain [illegible]~~
	11-7-88	"	4834	^3H <.06 μCi	Solid
3			4834	^3H <.06 μCi	Solid
2	"	"	"	^3H <2.683 μCi	Vials
4	11-14-88	Dubois	4834	^3H <2.37 μCi	Drain [illegible]
3	12-12-88	Dubois	4834	^3H [redacted] 0.8 μCi	Solid
2	"	"	"	^3H 36.18 μCi	Vials
	~~12-12-88~~	~~Dubois~~	~~4834~~	~~^3H 3.00 μCi~~	~~Drain [illegible]~~
3	12-15-88	Dubois	4833	^3H ^{14}C 1.5 + 1.7	Solid
3	12-15-88 (12-22-88)	Jean Hoffman	4883	^{14}C 10 μCi	Solid
	~~1-19-89~~	~~Kraemer~~	~~4822~~	~~^{125}I 366 [illegible] (18 μCi)~~	~~Solid <1.0 μCi~~
	~~3-14-89~~	~~Kraemer~~	~~4829~~	~~^{125}I 333 μCi (3-14-89)~~	~~Solid <1 μCi~~
3	3-1989	Siedlarski	4788	^{14}C+^3H <2.0 μCi	Solid
	~~5-?-89~~	~~Fan~~	~~4880~~	~~^{125}I [illegible]~~	~~Solid~~
	5-3-89	Lombardi	4883	^{32}P <125 μCi (9-10-89) (<1 μCi)	Solid
	6-1-89	"	"	^{14}C 16 μCi	Vials
	~~6-5-89~~	~~"~~	~~"~~	~~^3H 175 μCi~~	~~Vials~~
	9-20-89	Dubois	4834	^3H <.03 μCi	Solid

Rad. Waste Log

Date	Name or Lab	Ext.	Isotope + Amount	Remarks
10-10-89	Dubose	4834	^{125}I 5.474 pci	Solid
"	"	"	^{125}I 6.247 pci	Drain < [illegible]
10-10-89	Dubose	"	^{3}H 0.4 pci	Solid
"	"	"	^{3}H 0.2 pci	Drain < [illegible]
10-11-89	Dubose	"	^{125}I 5.48 pci	Drain < [illegible]
"			^{125}I 0.43	Solid
10-12-89	Dubose	"	^{125}I 0.44	Drain < [illegible]
	"	"	^{125}I 0.2	Solid
9-20-89	Stephenson	4834	^{125}I 0.705 pci	Solid [illegible]
9-21-89	"	"	^{125}I 1.16 pci	Solid < 1 pci
9-22-89	"	"	^{125}I 1.023 pci	Solid < 1 pci
10-25-89	Lombardi	4983	^{32}P [illegible]	Solid < 1.0 3/5/90
10-25-89	Stephenson	4834	^{125}I 14.03 3/11/89	Solid
[illegible]	Lombardi	[illegible]	[illegible]	Solid < .001 2/14/90
11-22-89	Lewis	4834	^{125}I < 1 pci : 10 [illegible] pci	Solid
11-30-89	Stephenson	4834	^{125}I 2.5 pci 1.023 pci 180 d/m	Solid < 1.0 pci 3/6/90
"	"	"	^{125}I 25 pci	Drain < .001 pci/[illegible]
"	"	4834	^{125}I 4.227 pci 190 d/m	Solid < [illegible] 3/9/90
12-1-89	Lombardi	4983	^{32}P 50 pci	Solid < 1.0 pci 3/11/90
12-1-89	Agnew	4834	^{125}I 10 pci 3/14/89	Drain < 1.0 3/14/90
"	"	"	^{125}I 15 pci 5/29/89	Drain < 1.0 3/27/90
"	"	4834	^{125}I 20 pci 6/4/90	Drain < 1.0 3/8/90
3-15-90	Stephenson		^{125}I 18.5 pci 1/22/90	Drain < 1.0 3/[illegible]
3-15-90	"	4834	^{125}I 10.4 pci	Solid
"	"	"	1/26/90 3.0 pci	Solid < 1.0 [illegible]
"	"	"	1/27/90 [illegible]	Solid [illegible]
"	"	"	^{125}I [illegible] 1/27/90	Solid < [illegible]
[illegible]	[illegible]	4834	^{125}I [illegible]	[illegible]

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No. [illegible]

ate To Barrel	Radionuclide	Form	Amount (mCi)	By
		Solid	[illegible]	[illegible]
	[illegible]	Solid	[illegible]	[illegible]
	[illegible]	Solid	3.5	[illegible]
		[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]
	[illegible]	Solid	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
	11-19-91	Barbara Shukitt	4185	^3H 10μCi	
	"	" "	"	" 20μCi	
	"	" "	"	" 20μCi	
	11/19/91	Barbara Shukitt	4185	^3H <10μCi	
	4/2/91	Lombardi (Amadowns)	4883	^3H 0.5μCi	
	4/2/91	" "	4883	^3H 10.0μCi	
	8/6/91	" "	4883	^3H 0.6μCi	
	11/18/91	" "	4883	^3H 0.67μCi	
	5/28/92	Arcadocoro	4932	^3H 4.0μCi	
	9/16/93	Dubose	4824	^3H 1.0μCi 3.0μCi 1.0μCi	
				1.0μCi 1.0μCi 1.0μCi	
	5/12/94	Arcadocoro		^3H 1.35mCi 9/28/93	
	3/2/94	Dubose	4824	^3H 3.0μCi	
	9/21/94	Dubose	4824	^3H 6.0μCi	
	3/1/94	Dubose	4824	^3H 5 Bags 11.9μCi	
	4/4/96	McGrath	4562	^3H 1mCi	
	4/5/96	Mello	5825	^3H 1μCi	

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
	7/28/91	Lombardo (Mello	4983	^{14}C 10 μCi	
		Mello	4266	^{14}C 10 μCi (5/12/92	
	4/4/96	McGrath	4562	^{14}C 50 μCi	

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount		Remarks
8	1-6-86	Dubose	4264	3H	25 μci	~~Vials~~
	1-10-86		"	3H	25 μci	~~Vials~~
8	~~5-7-86~~	~~Dubose~~	~~4264~~	~~3H~~	~~25 μci~~	~~Vials~~
~~8~~	~~"~~	~~"~~	~~4264~~	~~3H~~	~~25 μci Liquid~~	~~[illegible] 5.00~~
9	[redacted]	Dubose	4264	3H	25 μci	Solid
9	[redacted]	"	4264	3H	25 μci	Solid
8	"	"	"	"	"	~~Vials~~
	"	"	"	"	25 μci 1.00 μci	~~Liquid 5.00~~
9	[redacted]	Durhof	4872	14C	1 μci	Solid
	[redacted]	"	"	3H	1 μci	Solid
~~8~~	[redacted]	Dubose (6 Dec. 85)	4264	3H	25 μci	Solid
8	[redacted]	Dubose	4264	3H	25 μci	Vials
9	[redacted]	Dubose	4264	3H	25 μci	Solid
9	[redacted]	"	4264	3H	50 μci	Solid
9	[redacted]	Dubose	4264	3H	25 μci	Solid
9	[redacted]	"	"	3H	25 μci	Solid
	4-1-86	Kramer	4879	125I	2.66 μci	Solid waste
	4-3-86	"	"	"	5.32 μci	" waste
	4-8-86	"	"	"	5.32 μci	" "
	4-14-86	"	"	"	5.32 μci	" "
	4-14-86	"	"	125I	6.65 μci	4-15-86 Solid waste
	4-28-86	"	"	125I	2.92 μci	Solid waste
	4-30-86	Kramer	"	125I	2.93 μci	Solid waste
	5-1-86	Kramer	"	125I	2.93 μci	Solid waste
	5-2-86	Kramer	"	125I	1.3 μci	Solid waste
	5-5-86	"	"	"	2.93 μci	" "
	5-7-86	Kramer	"	125I	2.93 μci	Solid waste
	5-16-86	Trad	4880	125I	0.6 μci 2.6 μci	Solid waste
	5-26-86	Trad	4882	125I	1.3 μci	Solid waste

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remark
	5-16-86	Trad	4880	^{125}I <2.0-2.0-1.3 μci	Solid waste
	5-16-86	"	"	" 1.0 2.0 μci	"
	5-16-86	"	4880	^{125}I 7 Bags 4.0 μci	Solid waste
	5-16-86	Lewis	4877	^{125}I 3 μci 4 μci	Solid waste
	5-14-86	Jaber	4877	^{125}I 4.23	Solid waste
	5-28-86	Lewis	4877	^{125}I 2 μci 5.64 μci 1 μci	Solid waste
	6-9-86	Kramer	4879	^{125}I 3.37 μci	Solid waste
	6-16-86	Kramer	4879	^{125}I 5.25 μci	Solid waste
	7-9-86	"	4872	^{125}I 2.97 μci	Solid waste
	7-3-86	"	4874	^{125}I 3.3 μci	Solid waste
9	[redacted]	Dubose	4264	^{3}H 25 μci ^{3}H 25 μci ^{3}H 25 μci	Solid
	4-4-86	Dubose	4269	^{3}H 25 μci	Drum 6.001 μci
8	4-4-86	Dubose	"	^{3}H 25 μci	Vial
8	7-4-86	"	"	^{3}H 25 μci	Vial
	7-4-86	Gymnasium Animal Carcasses		^{3}H 300 μci ^{14}C 300 μci	Solid
9	[redacted]	Dubose	4269	^{3}H 2.6 ^{3}H 2.6 μci	Solid
8	7-3-86	Dubose	4269	^{3}H 2.6 μci	Sand
8	7-25-86	Dubose	4269	^{3}H 2.6 μci	Drum 6.001
8	[redacted]	"	"	^{3}H 2.6 μci	Solid
8	[redacted]	"	"	^{3}H 2.6 μci	Vial
	8-8-86	Kramer	4821	^{125}I 1.0 μci .37 μci	Solid
8	8-25-86	Dubose	4827	^{3}H 23.9 μci	Vial
8	8-27-86	Dubose	4827	^{3}H 12.5 μci	Vial
9	[redacted]	Dubose	4827	^{3}H 23.9 μci	Solid
8	8-22-86	Dubose	4827	^{3}H 25 μci	Vial
9	[redacted]	Dubose	4827	^{3}H 25 μci	Solid
	9-29-86	Kramer	4879	^{125}I 3.3 μci	Solid waste
	9-12-86	Dubose	4827	^{3}H 2.4 μci	[illegible]
	9-11-86	Dubose	4827	^{3}H 13.8 μci	[illegible]

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remark
	10/6/86	Trad.	4880	^{125}I <4.0 μci	Solid
	10/20/86	Kramer	4879	^{125}I 3.3 μci 2.7 μci	Solid
	10/27/86	Kramer	4879	^{125}I 4.49 μci 2.97 μci	Solid
	12/2/86	Kramer	4879	^{125}I 5.28 μci	Solid
	12/8/86	Trad	4880	^{125}I 8.0 μci	Solid
	10/22/86	Dubose	4824	^{3}H 3.4 μci	Drain <.001 μ
9	[redacted]	Dubose	4824	^{3}H 2.4 μci	Solid
9	[redacted]	"	"	^{3}H 13.8 μci	"
9	[redacted]	Dubose	4824	^{3}H 3.4 μci	Solid
8	9/12/86	"	"	^{3}H 2.4 μci	[illegible]
8	9/18/86		"	" 23.8 μci	[illegible]
8	10/23/86	Dubose	4824	^{3}H 3.4 μci	[illegible]
	12/17/86	Kramer	4879	^{125}I 4.6 μci	Solid
	12/30/86	Trad	4880	^{125}I (24 μci) = 12 μci	Drain <.001 μci/m
	12/31/86	Trad	4880	^{125}I (3 μci) = .375 μci	Drain <.001 μci/m
	12/31/86	"	"	^{125}I (6.5) = 1.15 μci	Drain <.001 μci/m
	12/31/86	Leva	4877	^{125}I 2.04 μci	Solid
	"	"	"	^{125}I 2.0 μci	"
	"	"	"	^{125}I < 3.0 μci	"
	12/31/86	Leva	4877	^{125}I 1.0 μci	Solid
	2/9/87	Kramer	4819	^{125}I 5.28 μci	Solid
	3/3/87	Dubose	4879	^{125}I 3.7 μci	Solid
	3/11/87	Kramer	4812	^{125}I 5.4 μci	Solid
	3/30/87	Kramer	4879	^{125}I 4.09 μci	Solid
	3/31/87	Pease	4872	^{125}I 1 μci	Solid
	4/1/87	Kramer	4879	^{125}I 8.91 μci	Solid
	4/6/87	Young	4880	^{125}I 1 μci	Solid
9	[redacted]	Dubose	4824	^{3}H 3 μci	Solid
9	[redacted]	"	"	^{3}H 22.2 μci	Solid

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
9	[redacted]	Dubose	4824	^{3}H 14.9 μci	Solid
9	[redacted]	"	"	^{3}H 5.9 μci	Solid
9	[redacted]	Dubose	4824	^{3}H 1.5 μci	Solid
	12/19/86	"	4824	^{3}H 3 μci 4/6/87	Drain < .001 μci/ml
	2/5/87	"	"	^{3}H 22.2 μci 4/7/87	Drain < .001 μci/ml
	2/2/87	"	"	^{3}H 14.9 μci 4/8/87	Drain < .001 μci/ml
	2/12/87	"	"	^{3}H 5.9 μci 4/9/87	Drain < .001 μci/ml
	2/12/87	"	4824	^{3}H 7.5 μci 4/10/87	Drain < .001 μci/ml
8	12/18/86	"	4824	^{3}H 3 μci	~~Liq~~
	2/5/87	"	"	^{3}H 5 μci	~~Liq~~
	~~2/9/87~~	"	"	~~^{3}H 14.9 μci~~	~~Liq~~
	~~2/12/87~~	"	"	~~^{3}H 5.9 μci~~	~~Liq~~
	2/12/87	"	"	^{3}H 7.5 μci	~~Liq~~
	4/14/87	Kramer	4879	^{125}I 8.57 μci	Solid
	4/15/87	Dunlap	4824	^{125}I 10 μci	Drain < .001 μci/ml
	4/16/87	12-18-87 A. Smith Dr. Sell.		^{125}I 7.5 μci	Solid
	4-16/87	Bowen		Nat U. 0.5 μci	Solid
8	[redacted]	Dubose	4824	^{3}H 0.8 μci	Solid
	~~[redacted]~~	"	"	~~^{3}H 1 μci~~	~~Liq~~
	~~4/20/87~~	~~Dubose~~	4824	^{3}H 1 μci	~~Drain~~ < .001 μci/ml
	[redacted]	Dubose	4824	^{3}H 0.8 μci	Solid
8	"	"	"	" 0.8 μci	~~Liq~~
	~~4/20/87~~	~~Dubose~~	~~4824~~	~~^{3}H 0.8 μci~~	~~Drain < .001 μci/ml~~
	~~5/7/87~~	Lora	4877	^{125}I < 4 μci < 1 μci < < 1 μci < 1 μci	Solid
	5/7/87	Lora	4877	^{125}I .25 μci < 1 μci < 1 μci < 2 μci	Solid
	5/8/87	Dubose	4824	^{3}H 2.62 μci	~~Drain~~ < .001 μci/ml
	5/18/87	Kramer	4879	^{125}I 5.28 μci 3.54 μci	Solid
	6/[illegible]/87	Kramer	4879	^{125}I 7.92 μci	Solid
	5/15/87	Kramer	"	^{125}I 5.28 μci 3.96 μci (15/17)	Solid

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remark
	~~5/[illegible]/87~~	~~Dubose~~	~~4824~~	~~3H 15.5 µci~~	~~Drain [illegible]~~
8	5/5/87	Dubose	"	3H 15.5 µci	~~Vials~~
	5/8/87	"	"	3H 2.62 µci	~~Vials~~
	5/22/87	Trad	4987	125I <2 µci	Solid
	6/9/87	Kraemer	4879	125I 5.28 µci	Solid
	6/9/87	Kraemer	4872	125I 3.96 µci 125I 3.96 µci	Solid
	7/2/87	Leva	4877	125I Oct <1.0 µci Mar <1.0 µci Apr <1.0 µci	Solid
	7/22/87	Kraemer	4879	125I 9.24 µci	Solid
	7/23/87	Kraemer	4879	125I 5.18 µci	Solid
	7/24/87	Kraemer	4879	125I 4.62 µci	Solid
	7/31/87	Kraemer	4879	125I 4.9 µci 4.24 µci 4.43 µci	Solid
3	[redacted]	Dubose	4824	BH 15.5 µci	Solid
3	[redacted]	"	4824	3H 2.62 µci	Solid
	~~7/29/87~~	~~Dubose~~	~~4824~~	~~3H 8.3 µci~~	~~Drain [illegible]~~
8 (2)	"	"	"	3H "	~~Vials~~
3	[redacted]	"	"	3H 8.3 µci	Solid
	~~8/[illegible]/87~~	~~Dubose~~	~~4824~~	~~3H <1.8 µci~~	~~Drain [illegible]~~
8 (2)	[redacted]	"	"	3H <1.0 µci	Vials
3	[redacted]	Dubose	4824	3H <1.0 µci	Solid
	~~8/[illegible]/87~~	~~Dubose~~	~~4824~~	~~3H <1.6 µci~~	~~Drain [illegible]~~
8 (2)	"	"	"	" "	~~Vials~~
3	[redacted]	Dubose	4824	3H <1.6 µci	Solid
	~~8/28/87~~	~~Dubose~~	~~4824~~	~~3H 1.3 µci~~	~~Drain [illegible]~~
8 (2)	[redacted]	"	"	" "	Vials
3	[redacted]	Dubose	4824	3H 1.3 µci	Solid
	~~9/2/87~~	~~Dubose~~	~~4824~~	~~3H 14.1 µci~~	~~Drain [illegible]~~
8 (2)	"	"	"	" "	~~Vials~~
3	[redacted]	Dubose	4824	3H 14.1 µci	Solid

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remark
	9/17/87	Dubose	4824	^{3}H 18.7 µCi	Drain <.001 µCi/ml
8(2)	[illegible]	"	"	~~^{3}H 18.7 µCi~~	~~Vials~~
3	[redacted]	Dubose	4824	^{3}H 18.7 µCi ~~<1.0 µCi~~	Solid
	8/17/87	Leva	4877	^{125}I <1.0 µCi <1.0 µCi	Solid
	8/26/87	Leva	4877	^{125}I <1.0 µCi <1.0 µCi	Solid
	9/10/87	Kramer	4879	^{125}I 6.83 µCi <1.0 µCi	Solid
	8/13/87	"	"	" 4.1 µCi (<1.0 µCi)	"
	7/31/87	"	"	" 6.48 µCi (<1.0 µCi)	"
	8/26/87	"	4879	^{125}I 2.12 µCi	Solid
	9/22/87	Dubose	4824	^{3}H 0.3 µCi	Drain <.001 µCi/ml
(2) 2	[redacted]	Dubose	4824	^{3}H <17.0 µCi	Vials
	[redacted]	"		^{3}H <1.0 µCi	Solid
	10/2/87	Dubose	4824	^{3}H <1.0 µCi	Drain <.001 µCi/ml
	10/21/87	Silverman	4983	^{125}I 200 µCi/9/21/87	<.001 µCi/ml
	10/22/87	Trad	4987	^{125}I <40 µCi 5/1/86	<0.2 µCi Solid
	10/22/87	Leva	4877	^{125}I <1 µCi 0.8 µCi <1 µCi <1 µCi <1 µCi	Solid
	11/10/87	Kramer	4879	^{125}I 7.33 µCi	Solid
	11/18/87	Kramer	4879	^{125}I 5.92 µCi Aug	Solid
	12/1/87	"	"	^{125}I 8.83 µCi July	Solid
(2) 2	11/24/87	Dubose	4824	^{3}H 22.6 µCi	~~Vials~~
(2) 3	[redacted]	Dubose	4824	^{3}H <.5 µCi	Solid
	11/24/87	Dubose	4824	^{3}H <2.0 µCi	Drain <.001 µCi/ml
2	12/23/87	Dubose	4824	^{3}H 22.6 µCi	~~Vials~~
3	[redacted]	"	"	" <.5 µCi	Solid
	12/23/87	Dubose	4824	^{3}H <2.0 µCi	Drain <.001 µCi/ml
	1/27/87	Kraemer	4879	^{125}I 8.67 µCi Aug	Solid
	2/29/87	Leva	4877	^{125}I .9 µCi 2.5 µCi 2.5 µCi 2.0 µCi 3.0 µCi	Solid <1.0 µCi

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remar
1	~~3-10-88~~	~~Kraemer~~	~~4877~~	~~^{125}I 3.33 pCi July~~	~~Solid~~
	~~4-6-88~~	~~"~~	~~4879~~	~~^{125}I 3.33 pCi Aug~~	~~Solid~~
2	4-27-88	Dubose	4824	^{3}H 0.27 pCi	~~Vials~~
	~~"~~		~~4824~~	~~^{3}H 0.0.24 pCi~~	~~Drain <.00~~
3	[redacted]	Dubose	4824	^{3}H ~~[illegible]~~ .006 pCi	Sol
3	[redacted]	Dubose	4824	^{3}H 0.2 pCi	Solid
	~~"~~	~~Dubose~~	~~4824~~	~~^{3}H <0.5 pCi~~	~~Drain <.00~~
2	5-5-88	Dubose	4824	^{3}H 10.1 pCi	~~Vials~~
	~~5-11-88~~	~~Dubose~~	~~4824~~	~~^{3}H 1.59 pCi~~ 7/25/86	~~Drain <.00~~
	~~7-7-88~~	~~Dubose~~	~~4824~~	~~^{125}I <2 pCi <2 pCi~~	~~Drain <.00~~
	~~1-12-88~~	~~Pease~~	~~4877~~	~~^{125}I 4 pCi 2 pCi~~	~~Solid~~
	~~4-6-88~~	~~Pease~~	~~4877~~	~~^{125}I 4 pCi Aug~~	~~Solid~~
	~~8-17-87~~	~~Leva~~	~~4877~~	~~^{125}I 7 pCi~~	~~Solid~~
	~~7-6-88~~	~~Leva~~	~~4877~~	~~^{125}I <1 pCi <1 pCi <1 pCi~~	~~Solid~~
	~~7-6-88~~	~~Leva~~	~~4877~~	~~^{125}I <2 I ^{125}I <2 pCi ^{125}I <2 pCi~~ Sept	~~Solid~~
3	[redacted]	Dubose	4824	^{3}H 0.5 pCi	~~Solid~~
	~~"~~	~~Dubose~~	~~"~~	~~^{3}H 1.9 pCi~~	~~Drain <.00~~
2	7-15-88	Dubose	4824	^{3}H 27.4 pCi	~~Vials~~
3	[redacted]	Dubose	4824	^{3}H <.21 pCi	Solid
2	7-26-88	"	"	^{3}H 9.45 pCi	~~Vials~~
	~~7-26-88~~	~~Dubose~~	~~4824~~	~~^{3}H <.84 pCi~~	~~Drain <.00~~
3	[redacted]	Dubose	4824	^{3}H 0.5 pCi	Solid
2	5-11-88	Dubose	4827	^{3}H 22.4 pCi	~~Vials~~
3	[redacted]	Dubose	"	^{3}H <.21 pCi	Solid
	~~"~~	~~"~~	~~"~~	~~^{3}H <.84 pCi~~	~~Drain <.00~~
2	8-4-88	Dubose	4827	^{3}H 9.45 pCi	~~Vials~~
	~~6-17-88~~	~~Kraemer~~	~~4879~~	~~^{125}I 3.33 pCi~~ 0.8 <1 pCi 1104	~~Solid~~

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remark
3	[redacted]	Lombardi	4983	^{3}H .00125 µCi = 1.25 mCi	Solid
3	[redacted]	Dubose	4824	^{3}H 0.14 µCi	Solid 0.142
2	"	"	"	^{3}H 5.13 µCi	~~Vials~~
	~~"~~	~~Dubose~~	~~4824~~	~~^{3}H 0.45 µCi~~	~~Drum < .001 µCi/g~~
	~~11-4-84~~	~~Gymerman~~	~~4852~~	~~^{3}H 3.8 µCi~~	~~Drum < .001 µCi/g~~
3	[redacted]	"	4852	^{3}H < 0.1 µCi	Solid
3	[redacted]	Dubose	4824	^{3}H < .06 µCi	Solid
2	"	"	"	^{3}H < 2.693 µCi	~~Vials~~
~~2~~	~~11-14-84~~	~~Dubose~~	~~4824~~	~~^{3}H < 2.33 µCi~~	~~Drum < .001 µCi/g~~
3	[redacted]	Dubose	4824	^{3}H 0.8 µCi	Solid
2	"	"	"	^{3}H 36.18 µCi	~~Vials~~
	~~12-12-80~~	~~Dubose~~	~~4824~~	~~^{3}H 3.02 µCi~~	~~Drum < .001 µCi/g~~
3	[redacted]	Dunkel	4877	^{3}H ^{14}C 1.5 + 1.7	Solid
3	[redacted]	Jean Mayer	4983	^{14}C 10 µCi	Solid
	(12-22-88) 1-10-89	Kraemer	4879	^{125}I 3.66 µCi (Apr 28-89)	Solid < 1.0 µCi
	3-14-89	Kraemer	4879	^{125}I 3.33 µCi (3-14-89)	Solid < 1.0 µCi
3	[redacted]	Sieckinski	4758	^{14}C + ^{3}H < 2.0 µCi	Solid
	~~5-3-89~~	~~Lera~~	~~4877~~	~~^{125}I < 1.0 µCi ^{125}I < 1 µCi < 1 µCi~~	~~Solid~~
	~~5-31-89~~	~~Lombardi~~	~~4983~~	~~^{32}P < 125 µCi (9-10-89) (< 1 µCi~~	~~Solid~~
Tag	~~6-1-89~~	~~"~~	~~"~~	~~^{14}C 2.6 µCi~~	~~Vials~~
Tag	~~6-5-89~~	~~"~~	~~"~~	~~^{3}H 1.75 µCi~~	~~Vials~~
3	[redacted]	Dubose	4824	^{3}H < .23 µCi	Solid
	~~"~~	~~"~~	~~4827~~	~~^{3}H < 11.44~~	~~Liquid < .001 µCi/g~~
3	[redacted]	Dubose	4827	^{3}H < .23 µCi (.226	Solid
	~~8-4-89~~	~~Dubose~~	~~"~~	~~^{3}H < 12 µCi~~	~~Liquid < .001 µCi/g~~
14 July 89	~~8-4-89~~	~~Gordon~~	~~4879~~	~~^{125}I 14.3 µCi 5.33 µCi 3.33 µCi~~	~~Solid~~
	~~8-31-89~~	~~Lombardi~~	~~4983~~	~~^{32}P 75 µCi 8-10-89~~	~~Solid~~ 1.0 µCi 12/19/89
	~~10-5-89~~	~~Dubose~~	~~4824~~	~~^{125}I 0.6 µCi~~	~~Solid~~

Rad. Waste Log

rum #	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
	~~10-11-89~~	~~Dubose~~	~~4834~~	~~^{125}I <.474 µCi~~	~~Solid~~
	~~"~~	~~"~~	~~"~~	~~^{125}I 6.24 µCi~~	~~Drain <.001 µCi~~
3	~~[redacted] 10-89~~	~~Dubose~~	~~"~~	~~^{3}H 0.4 µCi~~	~~Solid~~
	~~"~~	~~"~~	~~"~~	~~^{3}H 0.2 µCi~~	~~Drain <.04 µCi/ml~~
	~~10-11-89~~	~~Dubose~~	~~"~~	~~^{125}I 5.48 µCi~~	~~Drain <.001 µCi/ml~~
	~~"~~			~~^{125}I 0.73~~	~~Solid~~
	~~10-12-89~~	~~Dubose~~	~~"~~	~~^{125}I 0.472~~	~~Drain <.001 µCi/ml~~
		~~"~~	~~"~~	~~^{125}I 0.2~~	~~Solid~~
	~~9-20-89~~	~~Stephenson~~	~~4834~~	~~^{125}I 0.705 µCi~~	~~Solid~~
	~~9-21-89~~	~~"~~	~~"~~	~~^{125}I 1.16 µCi~~	~~Solid <1. µCi~~
	~~9-22-89~~	~~"~~	~~"~~	~~^{125}I 1.023 µCi~~	~~Solid <1. µCi~~
	~~10-25-89~~	~~Lombardi~~	~~4583~~	~~^{32}P 100 µCi 10/5/89 <1.0~~	~~Solid <1.0~~ 3/5/9
	~~10-25-89~~	~~Stephenson~~	~~4834~~	~~^{125}I 14.03 8/11/89~~	~~Solid~~ 11 Apr 9
	~~11-14-89~~	~~Lombardi~~	~~4583~~	~~^{32}P 150 µCi~~	~~Solid <.001~~ 6/17/90
	~~11-22-89~~	~~Lewis~~	~~4877~~	~~^{125}I < 1 µCi : Total 5 µCi~~	~~Solid~~
	~~11-30-89~~	~~Stephenson~~	~~4834~~	~~^{125}I 2.5 µCi 1.033 µCi 11/04/89~~	~~Solid <1.0 µCi~~ 3/6/9
	~~"~~	~~"~~	~~"~~	~~^{125}I 25 µCi~~	~~Drain <.001 µCi/ml~~
	~~"~~	~~"~~	~~4834~~	~~^{125}I 4.227 µCi 11/04/89~~	~~Solid <1.0 µCi~~ 3/9/9
	~~12-1-89~~	~~Lombardi~~	~~4583~~	~~^{32}P 50 µCi~~	~~Solid <1.0 µCi~~ 3/21/9
	~~12-1-89~~	~~Agnew~~	~~4834~~	~~^{125}I 10 µCi 12/14/89~~	~~Drain <1.0~~ 2/14/9
	~~"~~	~~"~~	~~"~~	~~^{125}I 15 µCi 5/29/89~~	~~Drain <1.0~~ 2/27/9
	~~"~~	~~"~~	~~4834~~	~~^{125}I 20 µCi 6/14/90~~	~~Drain <1.0~~ 3/8/90
	~~3-15-90~~	~~Stephenson~~		~~^{125}I 28.5 µCi~~	~~Drain <1.0~~ 3/15/90
	~~3-15-90~~	~~"~~	~~4834~~	~~^{125}I 10.1 µCi~~ 1/22/90	~~Solid~~
	~~"~~	~~"~~	~~"~~	~~^{125}I~~ 1/26/90 ~~2.0 µCi~~	~~Solid <1.0~~
	~~"~~	~~"~~	~~"~~	~~^{125}I 1.33~~ 1/24/90 ~~1.36~~	~~Solid~~
	~~"~~	~~"~~	~~"~~	~~^{125}I 2.18~~ 1/25/90	~~Solid <1.0~~
	~~3-17-90~~	~~[redacted]~~	~~4834~~	~~^{125}I 2.66~~	~~Drain <.001 µCi/ml~~

RADIOACTIVE WASTE

BARREL INVENTORY

Barrel No. 4

Date To Barrel	Radionuclide	Form	Amount (mCi)	By
[redacted]	^{3}H	Solid	<.06 µCi	Lombardi
[redacted]	^{3}H	Solid	<1.0 "	Lombardi
[redacted]	^{3}H	Solid	2.5 "	"
[redacted]	^{3}H	Solid	<.254 "	Dubose-Cinge
[redacted]	^{3}H	"	7.6 "	Dubose
[redacted]	"	"	0.4 "	"
[redacted]	"	"	0.042 "	"
[redacted]	^{3}H	Solid	<25 "	Lombardi
[redacted]	"	"	0.06	Dubose
[redacted]	"	"	0.08	Dubose

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remar
	[redacted]	Barbara Shukitt	4195	^3H 10μCi	
	[redacted]	" "	"	" 20μCi	
	[redacted]	" "	"	" 20μCi	
	[redacted]	Barbara Shukitt	4195	^3H <10μCi	
	[redacted]	Lombardi (Arcadocoro)	4983	^3H 0.5μCi	
	4/2/91	" "	4983	^3H 10.0μCi	
	[redacted]	" "	4983	^3H 0.6μCi	
	[redacted]	" "	4983	^3H 0.67μCi	
	[redacted]	Arcadocoro	4937	^3H 4.0μCi	
	[redacted]	Dubose	4824	^3H 1.0μCi 3.0μCi 1.0μCi 1.0μCi 1.0μCi 1.0μCi	
	[redacted]	Arcadocoro		^3H 1.35μCi 9/24/93	
	[redacted]	Dubose	4824	^3H 3.0μCi	
	9/21/94	Dubose	4824	^3H 6.0μCi ?	
	[redacted]	Dubose	4824	^3H 5 Bags 11.5μCi	
	[redacted]	McGrath	4562	^3H 1mCi	
	[redacted]	Mello	5825	^3H 1μCi	

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remai
	[redacted]	Lombardo (Mello	4983	^{14}C 10 μCi	
	[redacted]	Mello	4266	^{14}C 10 μCi (5/12/92)	
	[redacted]	McGrath	4562	^{14}C 50 μCi	

RAD WASTE INVENTORY LOG

Isotope: C-14 Half-Life: 5730 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity	Bag No.
12/09/87	Unknown	N/A	1400.0 µCi	10
12/18/88	Mayer	"	10.0 "	10
07/28/91	Dr. Mello	"	10.0 "	10
05/12/95	"	"	10.0 "	10
04/04/96	Dr. McGrath	"	50.0 "	~~10~~
11/08/96	Dr. Narayan	"	500.0 " (Two vials)	10
11/08/96	"	"	<1.0 "	Contaminated Plastic barrel (24"dia x30" high)
11/08/96	Arcidiacono	"	<1.0 "	Contaminated Plexiglass storage box, 10" cube

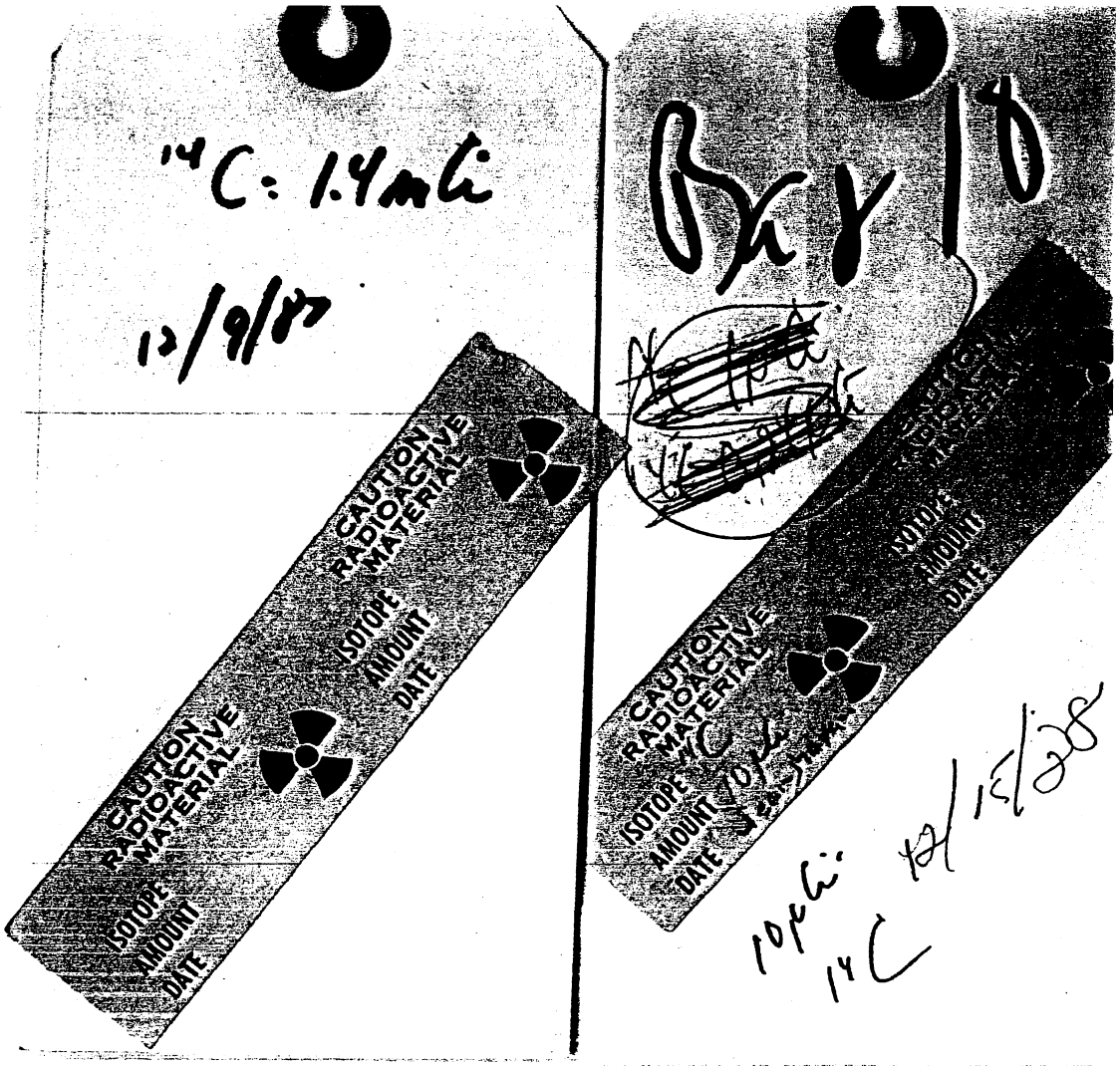
RAD WASTE INVENTORY LOG

Isotope: C-14 Half-Life: 5730 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: Yes

Bag #10

	Date Rec.	Principle User	SOP#	Activity	
10	12/09/87	Unknown	N/A	1400.0 µCi	
10	12/18/88	Mayer	"	10.0 "	
10	07/28/91	Dr. Mello	"	10.0 "	
10	05/12/95	"	"	10.0 "	
	04/04/96	Dr. McGrath	"	50.0 "	
10	11/08/96	Dr. Narayan	"	500.0 "	Two vials
	11/08/96	"	"	<1.0 "	Contaminated Plastic barrel (24"dia x30" high)
	11/08/96	Arcidiacono	"	<1.0 "	Contaminated Plexiglass storage box, 10" cube

Bag #10



14C: 1.4 mCi
12/9/87
Bag 18
CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE
AMOUNT
DATE
CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE
AMOUNT
DATE
CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE
AMOUNT
DATE
CAUTION
RADIOACTIVE
MATERIAL
ISOTOPE
AMOUNT
DATE
14C
10 μCi
12/15/88
10 μCi
14C

HW

HAZARDOUS WASTE TAG

DISCARDED BY

NAME

DIRECTORATE

BLDG/RM#

PHONE #

CHEMICAL NAME

PURPOSE

PH RANGE

% OF ELEMENTS

SIGNATURE:

STICK LABEL

(PRINT ALL INFORMATION)

HW

HAZARDOUS WASTE TAG

DISCARDED BY

NAME

DIRECTORATE

BLDG/RM#

PHONE #

CHEMICAL NAME

PURPOSE

PH RANGE

% OF ELEMENTS

SIGNATURE:

STICK LABEL

(PRINT ALL INFORMATION)

Bag #10

C-14

250 uCi

250 uCi

RAD WASTE INVENTORY LOG

Isotope: H-3 & C-14 Half-Life: 12.43 yrs & 5730 yrs
10 Half-Life: Not Applicable Age & Decay: Not Applicable
Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity		Bag No.
03/17/86	Dr. Durkot	NA	2.0	µCi	12
12/12/87	Sieckarski	"	<2.0	"	12
12/12/88	Dr. Durkt	"	3.2	"	12
03/14/89	Sieckarski	"	<2.0	"	12
11/05/96	"	"	<1.0	"	12
11/05/96	"	"	<1.0	"	12
11/08/96	"	"	<1.0	"	Contaminated: -Sink drain pipe (PVC 2"x48" lg) -Sink drain pipe (Copper 2"x30") -Sink trap (Cast iron 2"x24") -Vinyl garden hose w/ nozzle (½"x25')

RAD WASTE INVENTORY LOG

Isotope: H-3 & C-14 Half-Life: 12.43 yrs & 5730 yrs
10 Half-Life: Not Applicable Age & Decay: Not Applicable
Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity		Bag#
03/17/86	Dr. Durkot	NA	2.0	µCi	12
12/12/87	~~Unknown~~ JFS	"	<2.0	"	12
12/12/88	Dr. Durkot	"	3.2	"	12
03/14/89	Sieckarski	"	<2.0	"	12
11/05/96	"	"	~~<0.01~~ 1.0	"	12
11/05/96	"	"	<1.0	"	12
11/08/96	"	"	<1.0	"	Contaminated: -Sink drain pipe (PVC 2"x48" lg) -Sink drain pipe (Copper 2"x30") -Sink trap (Cast iron 2"x24") -Vinyl garden hose w/ nozzle (½"x25')

Bag #12

CAUTION

RADIOACTIVE MATERIAL

ISOTOPE ^{14}C ~~[illegible]~~ ^{3}H

AMOUNT 1.7 - 1.5

DATE 12/12/88 BY

DO NOT REMOVE THIS TAG

OF

CAUTION
RADIOACTIVE MATERIAL
ISOTOPE 3H
AMOUNT
DATE 12 Dec 88

CAUTION

RADIOACTIVE MATERIAL

ISOTOPE ^{14}C + ^{3}H

AMOUNT 1.0 μCi

DATE BY

DO NOT REMOVE THIS TAG

WITHOUT AUTHORIZATION OF

BAIRD ATOMIC INC.

10402 CAMBRIDGE, MASS.

CAUTION

RADIOACTIVE MATERIAL

ISOTOPE ^{14}C + ^{3}H

AMOUNT 1 μCi 1 μCi

DATE BY

DO NOT REMOVE THIS TAG

WITHOUT AUTHORIZATION OF

BAIRD ATOMIC INC.

10402 CAMBRIDGE, MASS.

CAUTION

RADIOACTIVE MATERIAL

ISOTOPE ^{3}H ^{14}C

AMOUNT 1 μCi

DATE BY

DO NOT REMOVE THIS TAG

WITHOUT AUTHORIZATION OF

BAIRD ATOMIC INC.

10402 CAMBRIDGE, MASS.

14C, <10pCi
3H, <10pCi
11/11/87
Bag 12
Bag 12

RAD WASTE INVENTORY LOG

Isotope: Ca-45 Half-Life: 23.29 Wks 10 Half-Life: 4 Yrs 25 Wks
Age & Decay: NA Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity	Bag No.
4/02/91	Julia Keith	D-25S	5.0 µCi	11
5/07/91	" "	"	0.5 "	11
6/26/91	" "	"	10.0 "	11
8/16/91	" "	"	10.0 "	11
6/11/91	" "	"	10.0 "	11
11/18/91	" "	"	30.0 "	11
3/26/92	" "	"	15.0 "	11
1/20/92	" "	"	25.0 "	11
5/28/92	" "	"	25.0 "	11
5/20/92	" "	"	10.0 "	11
3/02/96	David Kaplan	D-32S	500.0 "	11
3/20/96	" "	"	500.0 "	11
3/20/96	" "	"	1000.0 "	11
4/05/96	" "	"	0.5 "	11

RAD WASTE INVENTORY LOG

Isotope: Ca-45 Half-Life: 23.29 Wks 10 Half-Life: 4 Yrs 25 Wks
Age & Decay: NA Ship Off-Site: Yes

Date Rec.	Principle User	SOP#	Activity	~~Dispose After~~ Bas th
~~1.~~ 11 4/02/91	Julia Keith	D-25S	5.0 µCi	~~NA~~ 11
~~2.~~ 11 5/07/91	" "	"	0.5 "	"
~~3.~~ 11 6/26/91	" "	"	10.0 "	"
~~4.~~ 11 8/16/91	" "	"	10.0 "	"
~~5.~~ 11 6/11/91	" "	"	10.0 "	"
~~6.~~ 11 11/18/91	" "	"	30.0 "	"
~~7.~~ 11 3/26/92	" "	"	15.0 "	"
~~8.~~ 11 1/20/92	" "	"	25.0 "	"
~~9.~~ 11 5/28/92	" "	"	25.0 "	"
~~10.~~ 11 5/20/92	" "	"	10.0 "	"
~~11.~~ 11 3/02/96	David Kaplan	D-32S	500.0 "	"
~~12.~~ 11 3/20/96	" "	"	500.0 "	"
~~13.~~ 11 3/20/96	" "	"	1000.0 "	"
~~14.~~ 11 4/05/96	" "	"	0.5 "	"

15. _____

16. _____

17. _____

18. _____

19. _____

20. _____

21. _____

22. _____

Bag #41

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: Julia Keith
DIRECTORATE: SSD
BLDG/RM #: D-320
PHONE #: 5510
CHEMICAL NAME 45Ca ++
<10 uCi
PURPOSE:
4/4/91
PH-RANGE
% OF ELEMENTS
CAUTION RADIOACTIVE MATERIAL
ISOTOPE
AMOUNT
DATE
STICK LABEL
Julia Keith
(PRINT ALL INFORMATION)

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: Julia Keith
DIRECTORATE: SSD
BLDG/RM #: D-316
PHONE #: 5510
CHEMICAL NAME 45Ca ++ dry waste closure
PURPOSE:
PH-RANGE
% OF ELEMENTS
8/6/91
SIGNATURE:
STICK LABEL
Julia Keith
(PRINT ALL INFORMATION)

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: S Lombardi / KIRK
DIRECTORATE: SSD
BLDG/RM #: D 320
PHONE #: 4983/5510
CHEMICAL NAME 45Ca
PURPOSE: disposal
date: 4-2-91
PH-RANGE
% OF ELEMENTS
5 μCi
use: 3-1-91
SIGNATURE:
STICK LABEL
Steve Lombardi
(PRINT ALL INFORMATION)

HW #

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: Julia Keith
DIRECTORATE: SSD
BLDG/RM #: D-320
PHONE #: 5510
CHEMICAL NAME 45Ca ++
<15 uCi
PURPOSE:
3/20/92
PH-RANGE
% OF ELEMENTS
SIGNATURE:
STICK LABEL
Julia Keith
(PRINT ALL INFORMATION)

HW # ____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: Julia Keith
DIRECTORATE: SSD
BLDG/RM#: D 320
PHONE#: 5510
CHEMICAL NAME $^{45}Ca^{++}$
PURPOSE:
PH-RANGE 5/07/91
% OF ELEMENTS
<5 uCi total

SIGNATURE: Julia Keith
STICK LABEL
(PRINT ALL INFORMATION)

HW # ____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: S. ARCIDIACONO
DIRECTORATE: SSD
BLDG/RM#: D 320
PHONE#: 4983
CHEMICAL NAME ^{45}Ca
PURPOSE:
5/28/92
PH-RANGE
% OF ELEMENTS 25 uCi

SIGNATURE: Steve Arcidiacono
STICK LABEL
(PRINT ALL INFORMATION)

HW # ____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: Julia Keith
DIRECTORATE: [redacted] SSD
BLDG/RM#: D-316
PHONE#: 5510
CHEMICAL NAME $^{45}Ca^{++}$
<10 uCi
PURPOSE:
PH-RANGE 5/20/92
% OF ELEMENTS

SIGNATURE: Julia Keith
STICK LABEL
(PRINT ALL INFORMATION)

HW # ____

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: Julia Keith
DIRECTORATE: SSD
BLDG/RM#: D-316
PHONE#: 5510
CHEMICAL NAME $^{45}Ca^{++}$ dry waste <10 uCi
PURPOSE:
PH-RANGE
% OF ELEMENTS
6/26/91

SIGNATURE: Julia Keith
STICK LABEL
(PRINT ALL INFORMATION)

HAZARDOUS WASTE TAG

DISCARDED BY:
NAME: Julia Keith
DIRECTORATE: SSD
BLDG/RM#: D-316
PHONE#:
CHEMICAL NAME: $^{45}Ca^{++}$
PURPOSE: 1/30/92
PH-RANGE
% OF ELEMENTS
25 μCi
SIGNATURE: Julia Keith
STICK LABEL
(PRINT ALL INFORMATION)

HA[illegible]
DISCA[illegible]
NAM[illegible]
DIRE[illegible]
BLDG[illegible]
PHONE#: 55[illegible]
CHEMICAL NAME: $^{45}Ca^{++}$
PURPOS[redacted] assay
~30 μCi waste
PH-RANGE
% OF ELEMENTS
11/18/[illegible]
SIGNATURE: Julia Keith
STICK LABEL
(PRINT ALL INFORMATION)

^{45}Calcium
Date: March 20, 1996
User: Manzoor Shah
Quantity: 0.5 mCi

Bag 10

^{45}Calcium
Date: March 20, 1996
User: Manzoor Shah
Quantity: 0.5 mCi

Bag 10

^{45}Ca - 0.5 mCi
4-5-95
Bag 10

Bag 10

^{45}Calcium
Date: March 20, 1996
User: Manzoor Shah

Rad. Waste Log

Drum #	Date	Name or Lab	Ext.	Isotope + Amount	Remarks
	4/2/91	Julia Keith	5510	^{45}Ca 5μCi	
	5/7/91	" "	"	^{45}Ca 0.5μCi	
	8/16/91	" "	"	^{45}Ca <10μCi	
	6/26/91	" "	"	^{45}Ca <10μCi	
	9/11/91	" "	"	^{45}Ca 10μCi	
	11/18/91	" "	5510	^{45}Ca 30μCi	
	3/26/92	Julia Keith	5510	^{45}Ca 15μCi (3-30-92) 25μCi (12-4-92)	
	5/28/92	Julie Keith	5510	^{45}Ca 25μCi	
	8/28/92	Julia Keith	5510	^{45}Ca 10μCi	

ITEM	ACTIVITY/ ISOTOPE
Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5840A, S/N 2107A08582 ECD Model #18803-60520, S/N C1924	15 mCi Ni-63 November 84
Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5750 (5754B), S/N 746B01161 ECD Model #2-6195, S/N A755	2 mCi Ni-63
Electron Capture Detector, Gas Chromatograph, Bendix Corp. Model #25621R, S/N 100129 ECD Model #2500 (HP), S/N 18713A	15 mCi Ni-63
Static Electricity Eliminator B.K. Sweeney Mfg. Co. Model #7777	200 mCi H-3 August 1967
Vacuum Gage National Research Corporation Model #58796	275 µgram Ra-226
Vacuum Gage National Research Corporation Model #530 Alphatron	100 µgram Ra-226
Check Source (Plastic Rod)	1.5 µCi Ba-133
Check Source (Button)	3.2E-4 µCi Cf-252

RADIONUCLIDE INVENTORY

WORKSHEET

BML 20-315-2 (Exp. Date 31 July 1998) Date(s) 23 Dec. 96

No.	Radio-nuclide	Amount (μCi)	Date Measured	Responsible Individual	Remarks RPO Reference No.
2	^{3}H	<0.2	11-88	J.F. Siechanski Bldg 30 101	
1	^{14}C	<0.2	11-88	" " "	
11	^{129}I	0.017	2-80	J.F. Siechanski	
12	^{60}Co	0.232	8-31-71	J.F. Siechanski Bldg 30 101	
14	^{60}Co	16.71	4-22-77	" "	
17	^{133}Ba	0.5	1-75	" "	- 4/97
18	^{32}P sim	.0264	12-1-61	" "	Plastic Rod
19	^{60}Co	.01	8-28-79	" "	Check Source
20	^{125}I	.093	1-75	" "	
22	^{60}Co	0.11	7-21-69	" "	
24	^{60}Co	8.81	12-1-94	" "	
25	^{60}Co	188.54	12-1-94	" "	
26	^{137}Cs	0.25	5-89	" "	
27	^{60}Co	4.71 mCi	12-13-94	" "	
29	^{60}Co	66	2-1-78	" "	
~~32~~	~~^{132}Cs ^{60}Co~~	~~2.51~~	~~6-9-78~~	" "	
~~33~~	~~^{132}Cs ^{60}Co~~	~~2.51~~	~~6-9-79~~	" "	
35	^{137}Cs	28.26	4-22-79	" "	
41	^{137}Cs	9.04	9-25-72	" "	
42	^{60}Co	3.68	7-21-79	" "	
47	^{60}Co	0.5	6-20-80	" "	Check source
48	^{137}Cs	0.1	6-20-80	" "	Check Source
50	^{137}Cs	0.261	10-3-63	" "	
56	^{14}C	0.1	6-19-83	" "	

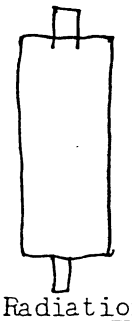
256-3115

Record of Sealed Source Leak Tests

Radionuclide: ^{226}Ra Activity: 275 μ grams Date: 6/27/97

Source Location:
Waste Drum

Diagram of Description of Source:



Radiation Measurements (in use - in storage):

Description of Test:
Wipe of Source Area (Housing)

Counting Results (uc):
0.25 CPM
0.1 CPM Bkgd
0.15 C.P.M

0.363 DPM = 6.05×10^{-3} Bq. / 100cm

Date: 6/23/97 Tested By: [signature]

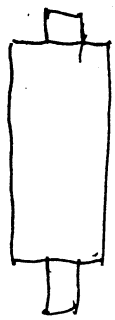
Date: 6/23/97 Counted By: [signature]

Record of Sealed Source Leak Tests

Radionuclide: ^{226}Ra Activity: 100 µgRams Date: 6/23/97

Source Location:
Waste Drum

Diagram of Description of Source:



Radiation Measurements (in use - in storage):

Description of Test:
Wipe of Housing Area (Source)

Counting Results (uc):

0.25 CPM
0.1 CPM Bkgd
0.15 C.P.M

1363 DPM = 6.05×10^{-3} Bq/100 cm^2

Date: 6/23/97 Tested By: [signature]

Date: 6/23/97 Counted By: [signature]

Record of Sealed Source Leak Tests

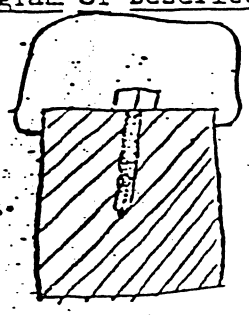
Radionuclide: Co^{60} **Activity:** 6.54 μCi **Date:** 1 June 97

TRECERLAB
Ser. No. = B34
M. No. = R131

Source Location:

Rad Lab
H.P.

Diagram of Description of Source:



Radiation Measurements (in use - in storage):

Calibration Source

Description of Test:

Wipe of Source

Counting Results (~~uc~~):

32.0 CPM
32.0 CPM Bkgd
0.0 CPM

NSID: Not Significantly different From Zero

Date: 6/13/97 Tested By: [signature]

Date: 6/13/97 Counted By: [signature]

Record of Sealed Source Leak Tests

Radionuclide: ^{63}Ni Activity: 15mCi Date: 6/26/93

Source Location:

Perkin Elmer.
M.NO = Sigma 3B
Decal No = 26009

Diagram of Description of Source:

Perkin Elmer Gas Chromatograph

Radiation Measurements (in use / in storage):

Source disassembled from instrument

Description of Test:

Wipe of Source Housing Area
wet wipe

Counting Results (uc):

69.7 CPM
53.1 CPM Bkgd
17.6 CPM

30.88 DPM = 5.15×10^{-1} Bq.

Date: 6/18/93 Tested By: J.F. Lechowicz

Date: 6/18/93 Counted By: J.F. Lechowicz

Record of Sealed Source Leak Tests

Radionuclide: ^{63}Ni Activity: 15mCi Date:

Source Location:

Bendex MN=2562
ECD-SNo=18713A

Diagram of Description of Source:

Located In Bendix Gas Chromatograph

Radiation Measurements (in use - in storage):

Source Disasembled From Instrument

Description of Test:

Wipe Of Source Housing Area

Wet Wipe

Counting Results (uc):

1645.6 CPM
52.1 CPM Bkgd
1593.5 CPM

2795.6 D.P.M. = 46.59 Bq

Date: 6/18/97 Tested By: J.F. Seidhashi

Date: 6/18/97 Counted By: J.F. Seidhashi

Record of Sealed Source Leak Tests

Radionuclide: ^{63}Ni Activity: 8 mCi Date: 12/21/83

Source Location:

HP Mod No. = 5750

ECD S. No = H755

Diagram of Description of Source:

Located in Hewlett Packard Gas Chromatograph

Radiation Measurements (in use - in storage):

Source disassembled from instrument

Description of Test:

wipe of Source Area Housing

wet wipe

Counting Results (uc):

80.2 CPM.

52.1 CPM Bkgd

28.6 CPM.

0.18 DPM → 8.36×10^{-1} Bq

Date: 6/18/97 Tested By: J. Fleschhauer

Date: 6/18/97 Counted By: J. Fleschhauer

Record of Sealed Source Leak Tests

Radionuclide: 63 Ni Activity: 15 mCi Date: 12/23/87

Source Location:

H.P. M.No= 5840A
ECD S.N= C1924

Diagram of Description of Source:

Located in Hewlett Gas Chromatograph

Radiation Measurements (in use - in storage):

Source disassembled from instrument

Description of Test:

Wipe Of Source Area

wet wipe

Counting Results (uc):

60.6 CPM
52.1 CPM Bkgd
8.5 CPM

4.91 DPM = 2.48×10^{-1} Bq

Date: 6/18/97 Tested By: [signature]

Date: 6/18/97 Counted By: [signature]

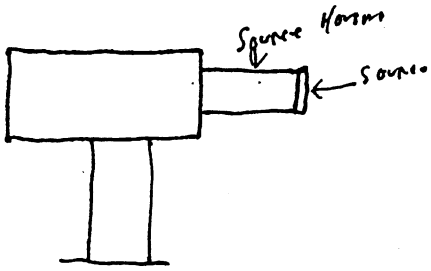
Record of Sealed Source Leak Tests

Radionuclide: ^{3}H Activity: 200 mCi Date: Aug. 1967

Source Location:

MFG. B.K. Sweeney, Mfg. Co
Denver Col
Model # 7777

Diagram of Description of Source:



Radiation Measurements (in use - in storage):

Description of Test:

Wipe OF Housing Source
" " Source Face (Front)
wet wipes

Counting Results (uc):

Housing Area 92.5 CPM
25.9 CPM Bkgd
66.6 CPM

5136 DPM = 2.52 Bq

ace Area 44.5 CPM
25.9 CPM Bkgd
18.6 CPM

2027 DPM = 7.04×10^{-1} Bq

Date: 6/18/97 Tested By: [signature]

Date: 6/18/97 Counted By: [signature]

ITEM	ACTIVITY/ ISOTOPE
Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5840A, S/N 2107A08582 ECD Model #18803-60520, S/N C1924	15 mCi Ni-63 November 84
Electron Capture Detector, Gas Chromatograph, Hewlett Packard Model #5750 (5754B), S/N 746B01161 ECD Model #2-6195, S/N A755	2 mCi Ni-63
Electron Capture Detector, Gas Chromatograph, Bendix Corp. Model #25621R, S/N 100129 ECD Model #2500 (HP), S/N 18713A	15 mCi Ni-63
Static Electricity Eliminator B.K. Sweeney Mfg. Co. Model #7777	200 mCi H-3 August 1967
Vacuum Gage National Research Corporation Model #58796	275 µgram Ra-226
Vacuum Gage National Research Corporation Model #530 Alphatron	100 µgram Ra-226
Check Source (Plastic Rod)	1.5 µCi Ba-133
Check Source (Button)	3.2E-4 µCi Cf-252
Tracerlab ^{60}Co Gamma Source Ser. No = B-311 - Cat. No, R-31 1.2 mCi 2-5-59	6.33 µCi 1 June 97

RADIONUCLIDE INVENTORY

WORKSHEET

BML 20-315-2 (Exp. Date 31 July 1998) Date(s)

No.	Radio-nuclide	Amount (µCi)	Date Measured	Responsible Individual	Remarks RPO Reference No.
1	~~^{3}H~~	~~<0.2~~	~~Nov. 88~~		~~Lg. STD Sent~~
2	~~^{14}C~~	~~<0.1~~	~~Nov. 88~~		~~" " Sent~~
	^{241}Am	0.036	Jul. 1984		Button
✓	^{210}Po	0.0476	7 Feb 89		" 2-7-87 1.3347×10^{-4} µCi
	^{14}C	0.0508	21 JAN 88		std check Source
	^{14}C	<.01			
	^{232}Th	0.03	JAN 80		
✓	^{14}C	2.58×10^{5}	JAN 62		
✓	^{60}Co	1.57×10^{3}			
✓	^{204}Tl	3.55×10^{3}		DPM/Sec.	
✓	^{210}Bi	2.97×10^{3}			
✓	^{106}Ru	2.25×10^{3}	JAN 62		
✓	^{60}Co				Slugs -
✓	^{60}Co				Slugs -
	^{14}C	24 mCi	1/5/88		Stock
	^{3}H	55.2 mCi	8/10/89		"
	^{63}Ni	23.4 mCi	7/31/89		"
	^{137}Cs	45.8 mCi	9/21/88		"
	^{241}Am	22.9 mCi	4/13/89		"
	^{90}Sr	22.4 mCi	11/9/89		"
	^{60}Co	90.2 mCi	7/19/88		"
	^{57}Co	152 mCi	11/20/89		Stock
	^{14}C	20 µCi	84		
	^{14}C	2.0×10^{3} DPM/ml	?		2.0×10^{5} Total - .09009 = 90.09 ml

RADIONUCLIDE INVENTORY

WORKSHEET

BML 20-315-2 (Exp. Date 31 July 1998) Date(s)

No.	Radio-nuclide	Amount (µCi)	Date Measured	Responsible Individual	Remarks RPO Reference No.
✓	$^{Cs}137$	0.1µCi	10-1-77		Rod - Pea Type B.A.
✓	^{129}I				4788 Packard
✓	^{137}Cs				A-384 "
✓	^{137}Cs		~~[illegible]~~		AP-158 Packard
✓	^{14}C	< 2µCi	2-5-77		} Std glass capsules
✓	^{14}C	0.20µCi	2-5-77		} Internal Stds
17	^{133}Ba	0.5	1-75 ~~[illegible]~~	10	

```
PROGRAM #:1
PRESET COUNT:99999.    ALPHA
PSET TIME (M):10.00
HIGH VOLTAGE:1500.
DISC WINDOW:1000.
START SAMPLE :1.
STOP SAMPLE:5.
ERROR (SIGMA):1.96
REPEAT #:0
A EFFIC (%):41.30
A CROSTLK (%):0
A BKGND (CPM):0
B EFFIC (%):23.00
B BKGND (CPM):0
BKGD TIME (M):10.00
VOL(EA ):1.00
ALARM (dpm/V):100.00
USER EQUATION:

SAMPLE #:1.        TIME (M):10.00     TIME:09:27:31 DATE:FEB 20,1997
 ALPHA GROSS: 2.       NET: .20       +/-.27      dpm:     .48       +/-.67
 BETA  GROSS: 8206.    NET: 820.60    +/-17.75    dpm:     3567.82 +/-77.19
 GAMMA GROSS: 0        C FACTOR:1.0000

SAMPLE #:2.        TIME (M):10.00     TIME:09:37:57 DATE:FEB 20,1997
 ALPHA GROSS: 1.       NET: .10       +/-.19      dpm:     .24       +/-.47
 BETA  GROSS: 9311.    NET: 931.10    +/-18.91    dpm:     4048.26 +/-82.22
 GAMMA GROSS: 0        C FACTOR:1.0000

SAMPLE #:3.        TIME (M):10.00     TIME:09:48:20 DATE:FEB 20,1997
 ALPHA GROSS: 3.       NET: .30       +/-.33      dpm:     .72       +/-.82
 BETA  GROSS: 3751.    NET: 375.10    +/-12.00    dpm:     1630.86 +/-52.19
 GAMMA GROSS: 0        C FACTOR:1.0000

SAMPLE #:4.        TIME (M):10.00     TIME:09:58:43 DATE:FEB 20,1997
 ALPHA GROSS: 1.       NET: .10       +/-.19      dpm:     .24       +/-.47
 BETA  GROSS: 103910.  NET: 10391.00+/-63.18      dpm:     45178.26+/-274.69
 GAMMA GROSS: 0        C FACTOR:1.0000

SAMPLE #:5.        TIME (M):10.00     TIME:10:09:06 DATE:FEB 20,1997
 ALPHA GROSS: 9.       NET: .90       +/-.58      dpm:     2.17      +/-1.42
 BETA  GROSS: 9171.    NET: 917.10    +/-18.77    dpm:     3987.39 +/-81.60
 GAMMA GROSS: 0        C FACTOR:1.0000
```

97%

```
SAMPLES ABOVE ALARM LEVEL
1.
2.
3.
4.
5.

ENTER DISC WINDOW:0
   PLATEAU DATA
ENTER DISC WINDOW:0
```

GENERAL RADIOISOTOPE PROCESSING CORPORATION
3120 Crow Canyon Road, San Ramon, California 94583
telephone 415-837-5424

20 grams

CAUTION

Californium-252 is a very new radioisotope and very little is known about its chemical and physical properties. While your Californium-252 contains a very small amount of radioactive material, it should be handled with care.

1. Do not under any circumstances attempt to disassemble the source.

2. Do not store or use the source around chemicals that might attack the polystyrene encapsulation (carbon tetrachloride, benzene, etc.)

3. Protect the source from high temperatures (melting point of polystyrene is about 250° F.)

4. Check the source periodically for leakage by wiping the source with tissue and checking the wipe for evidence of alpha activity.

GENERAL RADIOISOTOPE PROCESSING CORPORATION
3120 Crow Canyon Road, San Ramon, California 94583
telephone 415-837-5424 Disposed of 12/24/82
R#3 JPS
- 3.21 x 10^-4 μCi

CALIFORNIUM-252 NEUTRON SOURCE

Catalog No. 4598

The enclosed Californium-252 source was calibrated on 5-11-67 and the neutron emission rate was 1110 neutrons/second ± 5%.

Californium-252 decays by both spontaneous fission and alpha emission. The spontaneous fission half life is 66 years and 3.84 neutrons are emitted per fission. Thus, the neutron emission rate is 3.03 x 10^{12} neutrons/second/gram and a 1000 neutron/second source contains 3.3 x 10^{-10} grams of Californium-252.

This isotope also decays by alpha emission with a 2.2 year half life. This is the controlling mode of decay and decay corrections should be based upon this half life. The specific activity (alpha) of Californium-252 is 645 curies/gram and hence the alpha activity of a 1000 neutron/second source is 0.21 microcuries.

5/9

GENERAL RADIOISOTOPE PROCESSING CORPORATION

3120 Crow Canyon Road, San Ramon, California 94583

Note---Please identify your remittance with this invoice number.

Invoice No.

Invoice Date

Date Shipped 5-12-67

Your Order No. D AAG-17-67-K2792

Terms: 30 days net 1%-10 days

Sold To. U.S. Army Natick Laboratory
Finance and Accounting Officer
Natick, Mass. 01760

Shipped To: Same
Warehouse No. 20
Kansas St.

SHIPPED	BACK ORDER	QUAN.	DESCRIPTION	UNIT PRICE	AMOUNT
/		1	Cf-252 neutron source		
			Ship Air Parcel Post		
			Tax		
			Shipping and Insurance		
				Total	

GENERAL RADIOISOTOPE PROCESSING CORPORATION
3120 Crow Canyon Road, San Ramon, California 94583
telephone 415-837-5424 Disposed of [illegible]
R#3 JPS
- 3.21×10^{-4} μCi

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3120 Crow Canyon Road, San Ramon, California 94583
telephone 415-837-5424

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3. Protect the source from high temperatures (melting point of polystyrene is about 250° F.)

4. Check the source periodically for leakage by wiping the source with tissue and checking the wipe for evidence of alpha activity.

GENERAL RADIOISOTOPE PROCESSING CORPORATION

3120 Crow Canyon Road, San Ramon, California 94583

Note---Please identify your remittance with this invoice number.

Invoice No.

Invoice Date

Date Shipped 5-12-67

Your Order No. [illegible]

Terms: 30 days net [illegible] days

Sold To. [illegible] Laboratory
[illegible] Accounting Officer
[illegible]

Shipped To: [illegible]
Warehouse No. 28
Kansas St.

SHIPPED	BACK ORDER	QUAN.	DESCRIPTION	UNIT PRICE	AMOUNT
1		1	[illegible] Sources		
			Ship Air Parcel Post		
			Tax		
			Shipping and Insurance		
				Total	

AMSSC-S-ENS (385-11e) 4 April 1996

MEMORANDUM FOR Mr. Stephen Deberadinis, Director Logistic Directorate

SUBJECT: Equipment Embedded Radiation Sources

1. Ms. Jean Mayer, Science and Technology Directorate, has informed me that a Gas Chromatograph, Hewlett Packard Model 5840, Serial #2107A08582, Decal #21563, is no longer required for on-going investigations, has been "turned in" for property disposal, and is presently within Warehouse #20.

2. Please be advised that this item contains a 15 mCi radioactive Ni-63, Electron Capture Detection (ECD) cell. This item and the radioactive ECD cell are listed on SSCOM's U.S. Nuclear Regulatory Commission (NRC) License #20-00315-02 and can not be transferred or disposed of except through a NRC Licensee authorized to possess this commodity.

3. Alternatively, embedded radioactive sources have been removed from similar pieces of excess equipment. That equipment has then been disposed of through normal excess property channels such as DRMO. Until a determination and final disposition of the radioactive ECD cell has been accomplished please ensure this equipment remains within your control. Should you have any questions please contact Mr. John Sieckarski, extension 4758, or I may be reached at extension 5208.

PAUL G. ANGELIS
Radiation Protection Officer

CF:
Ms. Jean Mayer, Science and Technology Directorate
Mr. John Manning, Chief, Environmental, Safety and Health Office (ESHO)
Mr. John F. Sieckarski, ESHO
Mr. Daniel Zonderman, Logistics Directorate

SATNC-[illegible] (710-2a) Date 2 May 1995

MEMORANDUM FOR EQUIPMENT MANAGER, LOGISTICS DIRECTORATE

SUBJECT: Request for Equipment and/or Supplies

Issue ☐ Turn-In ☐ Shipment ☐ Services ☑ Project Equipment ☐

REQUESTOR: Paul G. Angelis DIRECTORATE/OFFICE Special Staff, ESO EXT. 5209 RM. D-02

PROJECT OFFICER: Paul G. Angelis PROJECT NO. _____ CAPR # _____

COST CODE: _____ BUDGET OFFICE APPROVAL: _____

PRIORITY DESIGNATOR (PD) ☐ 03 ☑ 06 ☑ 13 DATE REQUIRED: 6 June 1995

JUSTIFICATION FOR OBTAINING APPROVAL FOR PD 03 OR 06:

DATE DIRECTOR APPROVAL DATE COMMANDER APPROVAL

(JUSTIFICATION FOR REQUEST ON REVERSE)

PR # _____ (Assigned by Supply)

CLERK # _____ (Assigned by Supply)

ORDERING/TURN-IN INFORMATION

ITEM NO.	NSN/FSC	ITEM DESCRIPTION	QTY U/I	UNIT COST	TOTAL COST
1		HP Model #5840 Gas			
		Chromatograph Serial			
		#2107A08592. Located in			
		D-023.			
		Remove and dispose of			
		Ni-63 Sealed Source			
				GRAND TOTAL	

Attach separate sheet if additional space is required.

COMPLETE REVERSE SIDE

NATICK FL 405-E
1 JUN 94

PREVIOUS EDITIONS ARE OBSOLETE.

Chromatograph HP
BC 21563
model 5840
Serial 2107A08582

The Electron Capture Detector L

WARNING

THE EFFLUENT GAS STREAM FROM THE NICKEL-63 ELECTRON CAPTURE DETECTOR MUST BE VENTED TO A FUME HOOD TO PREVENT POSSIBLE HAZARDOUS CONTAMINATION OF THE LABORATORY WITH RADIOACTIVE MATERIAL. THE INLET FITTING OF THE DETECTOR SHOULD BE CAPPED WHEN NOT IN USE. CORROSIVE CHEMICALS (E.G., ACIDS) MAY REMOVE HAZARDOUS AMOUNTS OF NICKEL-63 PLATING AND SHOULD NOT BE INTRODUCED INTO THE DETECTOR.

THE MAXIMUM OPERATING TEMPERATURE OF THIS DETECTOR IS 350°C.

VOLUME 4 OF THIS MANUAL CONTAINS PROCEDURES FOR DISASSEMBLY AND CLEANING OF THE DETECTOR. THIS INFORMATION MUST BE READ BEFORE ATTEMPTING TO OPEN THE CELL ASSEMBLY.

IN THE USA DETECTOR VENTING MUST BE PERFORMED IN CONFORMANCE WITH THE LATEST REVISION OF TITLE 10 OF THE CODE OF FEDERAL REGULATIONS (CFR), PART 20 (INCLUDING APPENDIX B).

OWNERS OF NICKEL-63 ELECTRON CAPTURE DETECTORS MUST PERFORM WIPE TESTS PERIODICALLY (SEE THE END OF THIS SECTION).

DESCRIPTION

The electron capture detector (ECD) operates by sensing a decrease in the number of free electrons in the detector cavity due to their capture by electrophilic sample molecules. The electron supply is provided by beta decay of a suitable radioactive isotope in the detector cavity.

In the 5880 ECD the isotope is Nickel-63 with a half-life of 92 years. It decays emitting high energy electrons (beta particles). These undergo repeated collisions with carrier gas molecules producing about 100 secondary electrons for each initial beta particle. After further collisions the energy of these secondary electrons has been reduced to the thermal level and they can be captured by suitable sample molecules.

The electron population in the ECD cell is collected periodically by applying a short voltage pulse to the cell electrodes. After smoothing, the resulting cell current is compared to a reference current in the ECD electronics. The pulse interval is automatically adjusted to keep the cell current constant, even when some of the electrons produced are being captured by sample molecules. Thus the pulse rate rises when an electron-capturing peak is passing through the cell and returns to its base level when the peak leaves.

APPLICATIONS AND LIMITATIONS

Compounds vary greatly in their ability to capture electrons. The table gives some idea of the sensitivity to be expected for various chemical types:

Chemical type	Relative sensitivity
Hydrocarbons	1
Ethers and esters	10
Aliphatic alcohols, ketones and amines; mono-Cl and mono-F compounds	100
Mono-Br, di-Cl and di-F compounds	1000
Anhydrides and tri-Cl compounds	10000
Mono-I, di-Br and nitro compounds	100000
Di-I, tri-Br and poly-Cl or F compounds	1000000

These are only approximate figures; sensitivity can vary widely within each of the above groupings.

The formation of deposits may occur on the filament or internal passages of the detector resulting in baseline spikes, excessive drift or loss of sensitivity. If these symptoms occur, thoroughly flushing the detector with solvent may eliminate them.

WARNING

THE DETECTOR AND OVEN SHOULD BE COOLED BELOW THE FLASH POINT OF THE CLEANING SOLVENTS USED TO AVOID FIRE HAZARD.

1. Allow the detector and oven to cool to ambient (or below the flash point of the solvent being used).

CAUTION

TURN THE DETECTOR OFF BY KEYING IN:

DETECTOR B (or D) OFF

BEFORE TURNING OFF GAS TO THE DETECTOR. OTHERWISE THE DETECTOR COULD BE DAMAGED.

2. Turn off the carrier gas supply.
3. Disconnect the columns at the detector.
4. Disconnect the detector tubes at the detector solenoid valve. The detector solenoid valve is located behind the flow panel. To gain access to the tubes remove the hinged flowpanel cover, remove the two Pozidriv flow panel retaining screws and swing open the flow panel. The solenoid valve will be noticed as the panel is opened.
5. Using a syringe (e.g., 5mm gas tight syringe, part no. 9301-0045) and lengths of tubing, force solvent through the detector. All internal passages are interconnected and solvent should be forced through them all. For the standard TCD, remove the muffler wire and wipe it clean.

   Use a suitable solvent to dissolve the samples that were analyzed. A general purpose solvent that is sometimes effective consists of equal parts of Acetone, Methanol, and Hexane.
6. When finished, reconnect the detector tubes to the solenoid as originally installed. (Front detector tube to solenoid front-center fitting; rear detector tube to solenoid short side port fitting.)
7. Replace the muffler wire (standard configuration only).
8. Reconnect the columns.
9. Service the "S" Moisture Traps and associated Chemical Filters. (See FLOW SYSTEMS in this Section for details.)

NOTE

Cartridge replacement is described in Section D, TCD Corrective Maintenance of this manual.

EC DETECTOR MAINTENANCE

The radioactive Electron Capture Detector (ECD) has been designed to provide the degree of performance required for the 5880 Gas Chromatograph. However, as with any complex product, variations from its optimum performance can be expected when parts are contaminated or simply wear out. Routine cleaning and the replacement of items of an expendable nature are the responsibility of the user.

Wipe (Radioactive Leak) Test

In the United States, the Nuclear Regulatory Commission (or State agency in "Agreement States") requires Hewlett-Packard Ni63 Electron Capture Detectors to be tested for radioactive leakage and/or contamination at intervals not to exceed six (6) months. It is essential that this test be performed in order to assure regulatory compliance. Owners in other countries should check local and national regulations for equivalent requirements. The user's first leak test should be performed no later than six months from the date on the HP wipe test certificate which accompanies the detector. This test certificate and all subsequent leak test records must be retained as evidence of regulatory compliance.

Quick Frequency Test

Under existing operating conditions, at least 2 hours after the last sample was injected, key:

PLOT SIGNAL A (B, C, or D) ENTER
LIST ZERO ENTER
STOP PLOT ENTER

If the resulting number printed on the terminal exceeds 1000 indicating the background level of the signal, investigate the possibilities listed below:

Bad gas
Insufficient conditioning
Contaminated detector
Column bleed
Septum bleed
Moisture (from saturated traps)
Bleed from injector deposits
Leaks
Anode insulation leakage

NOTE

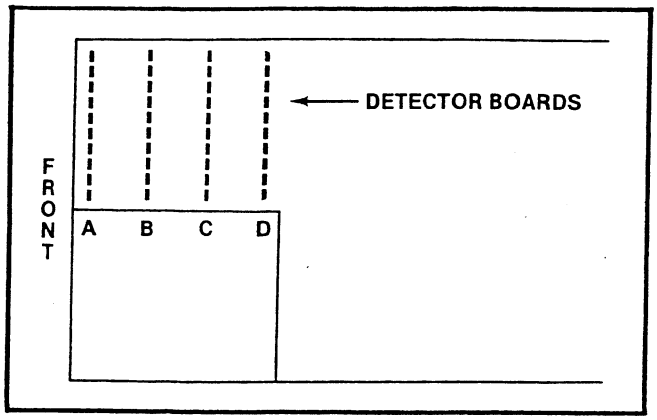
Starting from a cold detector and column, a 24 hour wait may be required until the baseline is completely stabilized for high sensitivity operation. Condition a new septum in the unused injection port for several hours with 1-5 ml/min carrier flow

Compounds in the first two groups are preferred solvents for ECD operation, although the third group may also be used with some loss of sensitivity and linear range.

CARRIER GAS

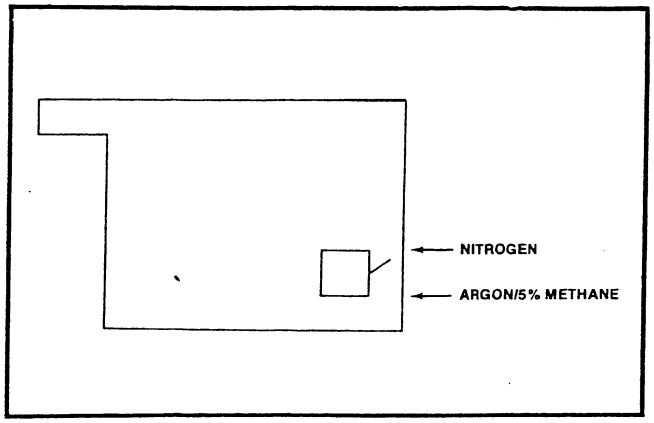
The ECD can use either argon/5% methane or nitrogen as the carrier gas. The linear range will be greater with the argon/5% methane mixture.

A selector switch on the printed circuit board serving the ECD must be set to the proper position for the carrier gas in use. To reach this switch the right panel of the mainframe must be removed.



The detector boards are located at the upper left (as seen from the side after removing the panel). They are identified as A through D and correspond to the detector locations in the detector zone.

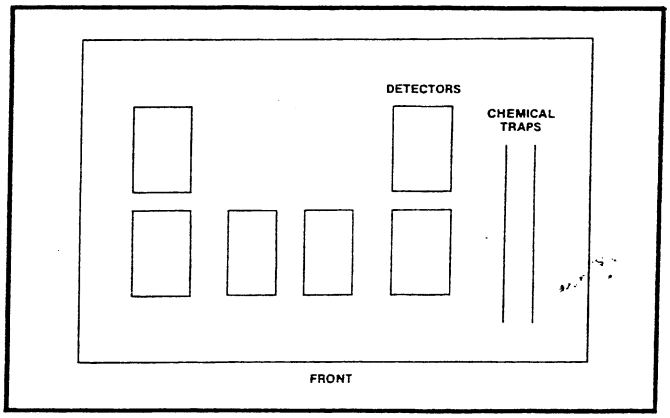
The carrier selector switch is visible as a red handle near the lower edge of the board. The upper position is for nitrogen; the lower position for argon/5% methane. It is not necessary to remove the board to change the switch position.



If the switch is in the wrong position for the carrier gas in use the detector will not operate properly.

Because of the very high sensitivity of the ECD it is essential that the carrier gas be dry. A molecular sieve drying tube must be installed in the carrier gas line and must be reconditioned regularly to keep it effective. Reliance on indicator-type drying tubes is not advisable since the indicator color change occurs at a moisture level higher than that which may degrade detector performance.

As a second line of protection, in addition to the carrier gas drier, small chemical traps are installed in each carrier line just ahead of the injectors. These are located on top of the mainframe just to the right of the detector area, as shown in the figure below. Their purpose is to remove trace amounts of organic materials which might interfere with detector operation. They *cannot* perform the function of the drier tube (their capacity is too small) and will quickly become ineffective if the drier is allowed to saturate.



If problems of baseline noise, loss of sensitivity or loss of linearity occur, the drier tube and the chemical traps should be reactivated by heating at 300°C overnight with dry carrier gas flowing through them.

DETECTOR TEMPERATURE

The temperature of the ECD detector should not be set above 350°C. The LIMIT key may be used to prevent this.

If the detector temperature should rise above 350°C, whether due to an incorrect setpoint entry or to an instrument malfunction, a safety circuit will turn the heater power off at 370 ± 10°C.

NOTE

If the safety circuit should deactivate the detector heater, a hardware problem exists in the instrument. Consult Volume 4 for information on diagnosing and correcting the problem.

Heater power cannot be restored except by turning the entire instrument off and back on again.

PERKIN ELMER

The Perkin-Elmer Corporation
761 Main Avenue
Norwalk, CT 06859-0001

September 2, 1993

Attn: SATNC-ZSR Paul Angelis
U.S. Army, Natick, MA
Research, Development & Engineering Ctr.
Natick, MA 01760

Dear Paul:

John Widomski, after speaking to you today, brought me the enclosed material to send to you. We are hoping that this paperwork will suit your needs.

Please call me anytime, 203-762-6984, if I can help further.

Sincerely yours,

Nancy Johnson

Nancy D. Johnson
Manager, Customer Service

NDJ:amd
Enclosure

Phone (203) 762-1000 Fax (203) 762-6000 Telex 96-5954

8 HAZARDS

As with any gas chromatograph, care must be taken to ensure that the apparatus is safe in all respects. The following areas should receive specific attention:

8A. COMPRESSED GASES

Cylinders (tanks) of compressed gases should be handled with caution. Avoid knocking the valves, and ensure that the correct valves and gauges are installed. It is recommended that gas cylinders be stored and sited outside the laboratory and connected to the instrument through copper lines. Take care not to kink or stress the gas lines. For safety, cylinders should be firmly clamped in position.

When hydrogen is used, either as the combustion gas for a flame ionization detector or as carrier gas with a hot wire detector, special care must be taken to avoid the build up of explosive hydrogen/air mixtures. Ensure that all couplings used in the hydrogen lines are leak free, and do not allow hydrogen to vent within the oven.

8B. VENTILATION

Adequate ventilation must be provided, particularly if a carbon dioxide Subambient Accessory is in constant use. When analyzing hazardous compounds, such as pesticides, it may be necessary to arrange for the detector effluent to be vented in a fume hood.

To ensure adequate cooling of the instrument electronics, do not obstruct the gap at the base of the instrument, and leave at least 6-in. clearance between instruments.

8C. ELECTRICITY

Ensure that the power cord is wired correctly, and that the ground leads of all electrical units (e.g., recorders, integrators) are connected together via the circuit ground to earth. Use only 3-prong outlets, with common earth ground connections.

Servicing should be performed only by a Perkin-Elmer Service Engineer or similarly authorized person.

The instrument must be unplugged from line power before any panels are removed.

8D. RADIOACTIVE MATERIALS

8D,1. In the United States

> **Important:** To install, remove or repair an Electron Capture Detector Cell requires a specific license by the U.S. Nuclear Regulatory Commission (NRC) and/or, in some states, by the equivalent state agency. For further information on obtaining a license, contact the Customer Service Department at the Perkin-Elmer Corp., Norwalk, Connecticut, or the NRC Material Branch, Office of Nuclear Materials, Safety and Safeguards, Washington, D.C. 20555. Specify Perkin-Elmer Electron Capture Detector, Part No. 330-0119.

Special instructions for Electron Capture Detector Cell purchasers who are not specifically licensed to handle radioactive material.

The Sigma Electron Capture Detector is equipped with a Detector Cell, P-E Part No. 330-0119, which contains a small quantity of Nickle 63 (Ni 63), a radioactive material. Your possession and use of this detector, therefore, is governed by regulation 10 C.F.R. Section 31.5, which is included in the back of this section as Appendix 1. Under the provisions of that Regulation you are deemed a "General Licensee".

Your possession and use of the Detector Cell may also be regulated by the state where you are located. The requirements of state regulatory agencies are substantially similar to those contained in NRC regulation 10 C.F.R. Section 31.5, but they may differ in some respects. It is suggested that you procure a copy of the regulations of your particular state. (We have included, as Appendix 2 at the back of this section, a list of the "Agreement States" which have been granted authority by the U.S. Nuclear Regulatory Commission to regulate the posession and use of radioactive material.)

It is required that you be familiar with regulation 10 C.F.R. Sec. 31.5 (Appendix 1). We have, however, prepared the following summary of its requirements (paragraphs a through e, below.)

a. Labels

Do not remove any of the labels attached to the ECD cell or any of the labels attached to your Gas Chromatograph that refer to the ECD cell. Follow all instructions and abide by all precautions provided by the labels and in the user instruction materials referred to by the labels.

b. Leak Testing

You are obligated under federal and state regulations to make certain that the ECD cell is wipe-tested for leakage of radioactive material at intervals of no longer than six months, and that the analysis of these wipe tests is conducted by a person specifically licensed to do so, either by the U.S. Nuclear Regulatory Commission or by an Agreement State. (The analysis can be performed by the Nuclear Radiation Dev. Corp. or by Nuclear Sources and Services; the addresses are given in Section 10 of this manual.)

Note: As a General Licensee, you may collect the wipe-test samples for analysis as described in Section 9 of this manual. However, the samples must be sent for analysis by the Services mentioned above, or some other person licensed to do so.

You are required to maintain records of the leak testing, which must show the test results, test dates, and the names of persons performing testing, installation, servicing and removal of the ECD cell. Records should be maintained for two years.

c. Failure of the Cell or Damage to the Cell

If a leak test detects more than 0.005 microcurries of removable radioactive material on the surface of the ECD cell, or if the cell itself is damaged in such a way as to indicate that it may no longer adequately shield the radioactive material inside, you must immediately suspend operation of your chromatograph until the cell has been repaired or disposed of by a person licensed to do so. Any such incident must be reported by you to the Regional Office, Inspection and Enforcement, U.S. Nuclear Regulatory Commission.

d. Reporting Radiation Incidents, Theft or Loss

Please read Regulation 10 C.F.R. Sec. 20.402 and 20.403 (included as Appendix 3 in this section) which describe your duties should the radiactive material (Ni 63) in the ECD cell be lost, stolen, or released, or should any person be exposed to radiation.

e. Other Requirements

Regulation 10 C.F.R., Section 31.5 (see Appendix 1) does not permit you to abandon the ECD cell or export it. It may not be tranferred, except to a person specifically licensed to receive it. Within thirty days of such a transfer, you must report to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20251, the name and address of the transferee. However, no report is needed to transfer a used or a defective ECD cell to Perkin-Elmer in order to obtain a replacement. You may transfer the ECD cell to another general licensee, like yourself, only when it remains at the same location to which it was shipped by Perkin-Elmer. Give the transferee a copy of these instructions and the accompanying regulations, and report to the commission as requried in Regulation 10 C.F.R., Sec. 31.5

Warning: While the ECD cell can be removed from the chromatograph if a specific license has been obtained (see the Important notice at the beginning of Section 8D), THE CELL SHOULD NEVER BE DISMANTLED.

8D,2. In the United Kingdom

In the U.K., registration is required under the Radioactive Substances ACT 1960, for anyone keeping or using radioactive materials. Application should be made to one of the following governing bodies:

ENGLAND - Department of the Environment
Queen Anne's Chambers
Tothill Street
London, SW1H 9J4

SCOTLAND -	Scottish Development department 21 Hill Street Edinburgh, EH2 3J4
WALES -	Welsh Office Cathay's Park Cardiff, CF1 3NG
NORTHERN IRELAND -	Ministry of Development Parliament Building Storemont Belfast, Northern Ireland

When the equipment is used in research or teaching establishments, the user's attention is especially directed to the 'Code of Practice for the protection of persons exposed to ionizing radiations in Research and Teaching'. Further advice may be obtained from:

Department of Productivity Advisory and Information Unit
Baynard's House
1-13 Chepstow Place
Westbourne Grove
London, W2

(The NRC Wipe Test is not required in the U.K.)

8E. HEATED ZONES

Heated zones should be treated with caution. Avoid physical contact with the injector caps if heated injectors are installed. The grill on the detector cover may also get hot, especially if flame detectors are operated at high temperatures (in excess of 300°C). As a general rule, allow heated zones to cool before attempting to touch the injector or detector areas.

D) FPD Maintenance

1) Switch off the photomultiplier tube and turn off the combustion gases.

2) Remove the detector block outer cover.

3) Uncouple the light guide (Figure 9-4) at the detector (3/8-in. fitting).

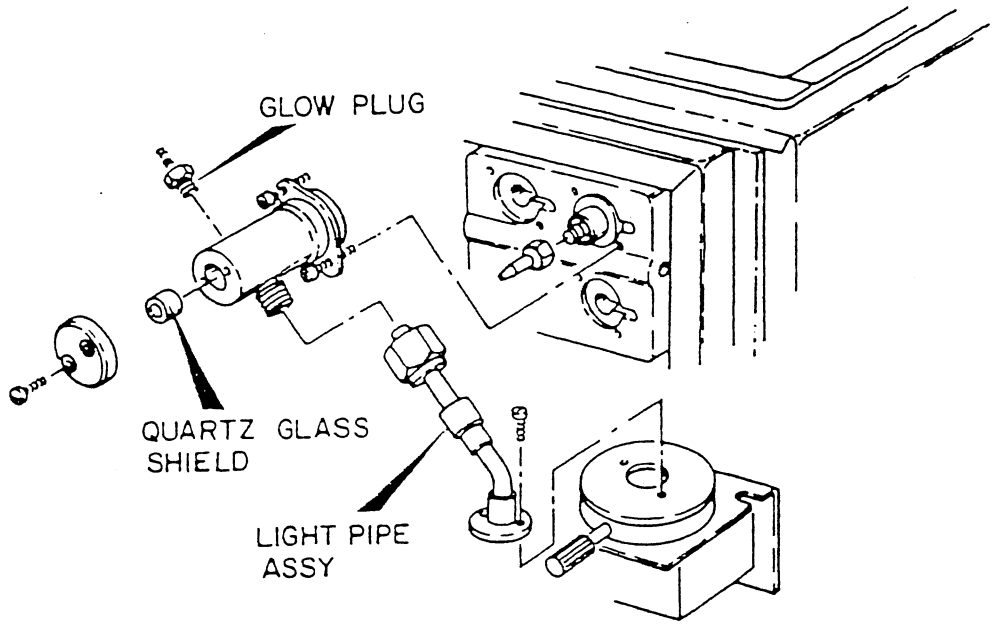


Figure 9-4. Dismantling the FPD

4) Disconnect the detector plug from the bracket below the detector.

5) Remove the end cap and the whole cap assembly. Scrape off any deposits from the cap.

6) Remove the thermal insulation from around the detector body and unscrew the two screws that are then exposed. The detector body may then be pulled off the detector block.

7) Remove the jet using a suitable wrench and clean it with a soft tool (piece of wood) and a suitable solvent. Do not poke metal objects into the jet. Replacement jets (Part No. 0330-0194) are available if required.

8) Pull off the electrical connections for the ignition plug on the detector body, and partially unscrew the plug. Invert the body and the glass heat shield will slide out from the top of the body. Clean the glass with chromic acid. Replacement heat shields (Part No. 0045-1417) are available if required.

9) Reassemble the detector following the above procedure in the reverse order.

E) ECD Cleaning and Maintenance Procedure*

1) Bake-Out Procedure

It is often possible to decontaminate the ECD by purging it with carrier gas using a flow rate of 50 to 100 cm^3/min. and raising the temperature to 400°C. These conditions should then be maintained until the detector is clean. Periodically, plot a graph of standing current setting versus frequency, as described in Section 6I,2 of these instructions. The plot should improve as cleaning progresses, but complete cleaning may require baking for several hours or even days, depending on the type and extent of contamination.

> **Important:** Never attempt to flush the detector cell assembly with acidic solvents, as this will result in the removal of radioactive material from the cell.

2) Wipe Test

The United States Nuclear Regulatory Commission requires that the detector be wipe tested at least once every six months, and that a record of the results of these tests be maintained for NRC inspection. The purpose of the wipe test is to ensure that removable radioactive contamination on the external parts of the cell remains at a safe level.

> **Important:** Until the results of the wipe test are known, assume that the cell is contaminated and handle it only with suitable protection. All equipment coming into contact with the cell should be considered contaminated and handled accordingly.

It is strongly recommended that the user become familiar with the NRC regulations covering the use of nickel-63, as well as any other national, state or local requirements.

Note: The NRC wipe test is not required in the U.K.

Perform the wipe test as follows:

1) Switch the instrument off and allow the detector to cool.

*The most likely place for condensation and contamination to occur is on the collector (anode). Anode cleaning can be attempted before performing the bake out procedure by removing the anode, cleaning it with hexane solvent, baking it at 250°C, and replacing it.

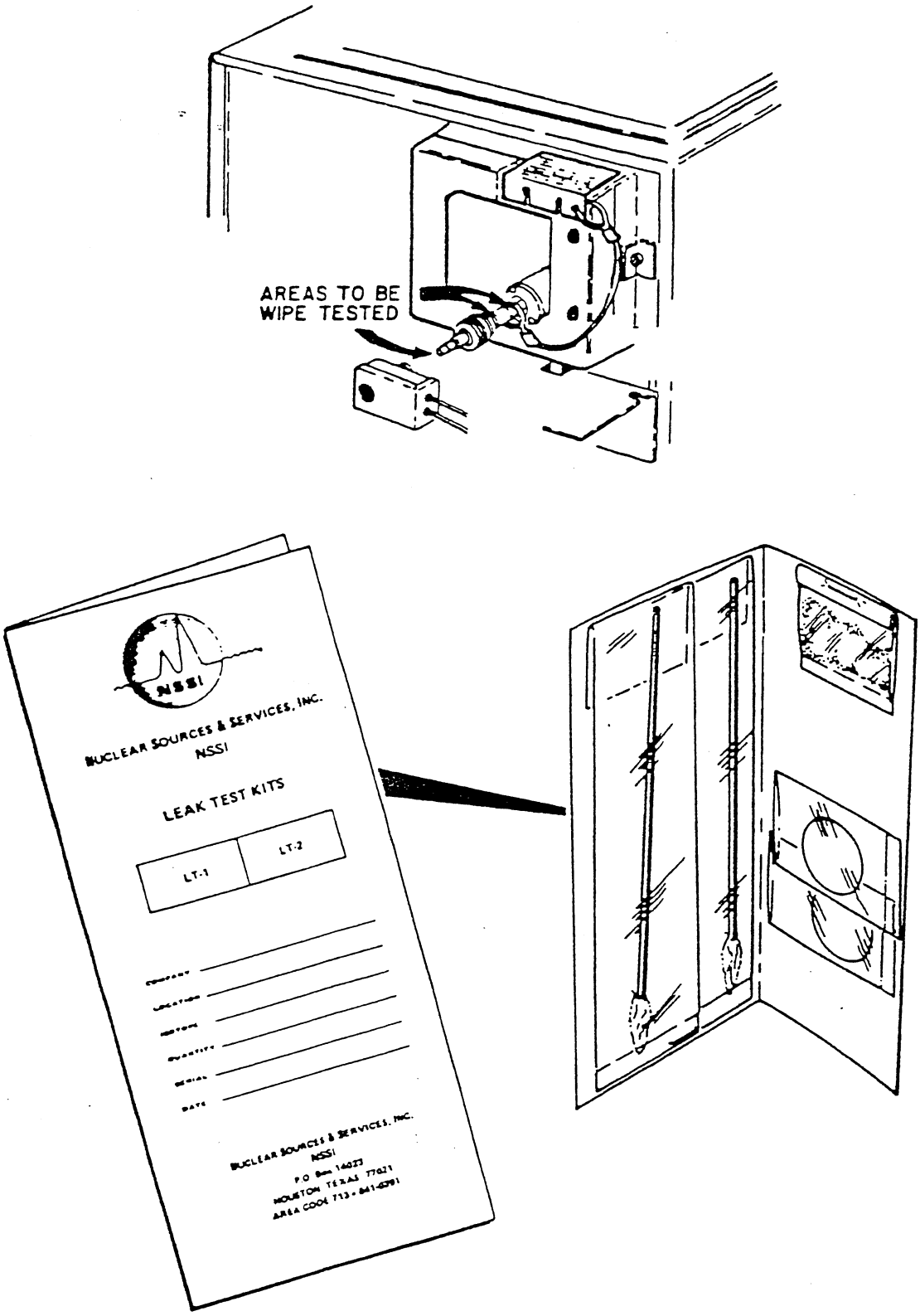


Figure 9-5 - The ECD Wipe Test

2) Expose the detector by pulling the detector cover forward and downward. The cover may be detached completely if required.

3) Pull off the collector housing (Figure 9-5).

Warning: DO NOT DISMANTLE THE CELL.

4) Refer to the instructions included with the wipe test kit (Part No. 0009-1667) supplied with the detector, and wipe the external surfaces of the cell, as shown in Figure 9-5. Once the wipe test paper has been moistened and any part of the cell has been wiped, do not re-moisten the paper. Also, do not allow any of the wipe test solution to enter the cell.

5) Put the paper in the container provided in the wipe test kit. Include a data sheet stating that the wipe test was performed on a Perkin-Elmer electron capture detector cell, Part No. 0330-0119, and give the date of the test. Return the container to either:

~~Nuclear Radiation Dev. Corp.~~
~~2937 Alt. Blvd.~~
~~Grand Island, N.Y. 14070~~

or

~~Nuclear Sources and Service~~
~~5711 Etheridge~~
~~Houston, Texas 77017~~

NATIONAL LEAK TEST CENTER
P.O. BOX 486
N. TONAWANDA, N.Y.
14120

Note: The sensitivity of the wipe test is 0.0001 microcuries.

Request that a new wipe test kit be forwarded with the test results.

9B,6. Restrictor Assembly for the Oven Lid Opener

If the oven lid does not open properly, i.e., the lid will not rise when the oven requires cooling, it is likely that the restrictor assembly has become plugged. A spare restrictor, Part Number 0330-1641, is supplied with the instrument.

To replace the restrictor, unscrew the nut that secures the restrictor using a 3/8-inch wrench (see Figure 9-6). Using a 5/16-inch wrench, unscrew the restrictor and remove it. To install the new restrictor, reverse the procedure described above. Use a back-up wrench on the fitting to prevent its rotation when tightening the connection.

Post-it® Fax Note 7671	Date 8/23	# of pages ▶ 7
To PAUL HUGELUS	From ED GENTILE	
Co./Dept.	Co. P.E.	
Phone # 508-651-5208	Phone # 203-761-2567	
Fax # 508-651-5393	Fax # 203-761-5057	

ALL SERVICE MEMO
FROM: L.Romano & J.Widomski
DATE: 02/22/95
SUBJECT: ECD Regulations
REF. NO.: 9000238A.ATN (BBS Version less Attachments)
DISTRIBUTION: U.S. Only

A number of repeat questions concerning ECDs continue to be raised by the field. In order to try to address these, and clarify some of the legal requirements, I have put together the following questions and answers.

1. Who is Perkin-Elmer's Radiation Safety Officer (RSO)?

The radiation officer for the Instrument Division is ~~John Widomski~~. The radiation safety officer is the person assigned the responsibility of ensuring the proper handling of licensed radioactive material by a company (or one of its divisions) as well as being the direct interface to the NRC and other state agencies. Working with John is Sharon Mezes. They are both located in Norwalk. Sharon has access to the records and is presently responsible for the day to day activities. John handles all licensing questions. There may be additional RSOs within other PE divisions, however, they would not have any responsibilities with respect to the ECDs.

2. What is the difference between a specific and general ECD license?

A specific license allows the licensee (our customer) to work directly with the radioactive materials specified on their license. This gives them the ability to clean and refurbish the cell and anode assembly. They obtain the NRC specific license themselves and work directly with the NRC or applicable state agency. When they hold a specific license, PE's responsibilities end after customer receipt of the cell.

A general license allows Perkin-Elmer to distribute ECDs to our customers for their use. The customer fills out the PE general license form which names the individual who will be responsible for the wipe tests and maintaining a record of the tests. They (our customers) have no license per se. The customer is not allowed to work directly with the cell and anode assembly because of potential contact with radioactive materials. They are allowed to remove the ECD in total and send it out for refurbishing/cleaning or scrapping. Any and all changes to the status of their ECD, (i.e., change of ownership, change of address, scrapping) must be reported back to Perkin-Elmer for the life of the product.

3. What license(s) does Perkin-Elmer hold?

The Instrument Division presently holds two licenses.

USNRC Materials License 06-02135-08 is our specific license. This license allows PE and its personnel to experiment with, service, distribute (foreign and domestic), and assemble into gas chromatographs electron capture detectors containing 15 millicuries of Ni63.
USNRC Materials License 06-02135-12G is our general license. This license allows PE to distribute ECDs to US customers.

4. What ECD model numbers are registered with the NRC?

There is some confusion as to what "model" numbers are registered with the NRC and appear on our license. The NRC registers and safety checks, the complete assembly and not just the sealed source (this is why we can only sell the complete assembly by law). The applicable ECD model numbers with their NRC registry number for 120V instruments follow:

AutoSystem	N610-0063	NR-536-D-110-B

8000	L413-0128	NR-536-D-107-B
Sigma 2000	N600-0113	NR-536-D-109-B
Sigma Series	0330-0119	NR-536-D-107-B

As you can see neither the N600-0204 nor the N610-0133 is the correct number to use when dealing with the NRC or state agencies. Also, these two part numbers cannot be sold as replacement or spare ECDs. It should also be noted that both the 8000 and Sigma ECDs are on the same registry.

5. My customer presently has a specific license. Can they transfer to the PE general license ?

The answer to this question is generally yes, however, all models are not licensable and many customers illegally transfer ownership of old equipment.
The original Sigma detector was not designed to meet the general license requirements. In 1981 modifications were made to the cell and from 1982 on, all detectors built could be generally licensed. All ECDs prior to the Sigma model line are NOT generally licensable.
As for the illegal transfer of cells, the customer must show PE that the chain of ownership was unbroken and has been transacted according to NRC regulations. No exceptions can be made to this requirement!!

6. What is the procedure for my customer to transfer to PE's general license?

Assuming the chain of custody check is acceptable, if the hardware is 1982 vintage or beyond, the customer simply writes a letter to Perkin-Elmer (to either Sharon's or John's attention) requesting to be placed on PE's general NRC license. In the body of the letter the customer needs to state the model # of the ECD, the four digit serial #, the location address of the cell, and the person in the lab that will be responsible for wipe testing and record keeping. Simultaneously, the customer needs to write a letter to the NRC informing them of their plans to

abandon their specific license. A copy of the NRC letter should be sent to PE and a copy of the PE letter should be sent to the NRC.
If the cell needs modification, that will have to be done first. When complete, the same procedure above is followed.

7. How can I tell if the Sigma ECD my customer has needs modification?

This is relatively simple. The most obvious difference is the lack of the black identification tag attached to the detector via a wire tether.

8. What modifications are necessary to make the detector generally licensable.

The two modifications necessary are the attachment of the ID tag with the pertinent information and the addition of an anti-tamperproof screw to the assembly.

9. My customer wants to scrap their cell. Do they send it back to PE?

NO!! PE is not a disposal site, nor do we want to be the middle man in the disposal scenario. Our vendor, NRD Inc., is a licensed disposal site and in fact was probably the originator of the foil in the ECD. They will accept ALL PE ECDs for disposal for a nominal charge ~$100. They can be contacted by phone at (716) 773-7634 or Faxed at (716) 773-7744. Our contact at NRD is Larry Keating. This information can also be found in the AutoSystem Operators Manual.

10. My customer wants to have their ECD refurbished. What should they do?

The customer can remove the ECD (even under the PE general license) and send it to any of the companies that offer this

service. Since the cells are originally assembled and tested by NRD Inc., we suggest using them for refurbishing. This information can also be found in the AutoSystem Operators Manual. PE does NOT refurbish/clean cells!

11. My customer is moving their ECD to a new site. What do they do?

If the customer has a specific license they work directly with the NRC or applicable state agency. If the customer is covered by the PE general license, they must inform us (Sharon) of the move so that this information can be recorded in our files as well as passed on to the NRC for their records.

12. My customer is selling their GC equipped with an ECD. What do they do ?

The law is quite clear, specific licensees can transfer ECDs to other specific licensees, while customers that are generally licensed can only transfer the device back to PE or scrap the cell. If a company wants to sell a generally licensed cell then they must send PE a letter stating that they want to transfer ownership back to PE. PE can then clerically redistribute the cell to the new customer. The new customer can have either their own specific license or be covered by the PE general license.

13. Is special packaging needed to ship an ECD?

The ECD is a "sealed source" containing a foil loaded with 15mCi of Ni63, therefore it needs no special packaging and can be sent via regular mail.

14. My customer commented that the ECD on their GC had a wipe test date which was nearly expired at installation. How come?

Wipe tests are good for 6 months. Depending on order rates

and order quantities, the cells may be in PE stock from days to months. The policy at Perkin-Elmer is that we will not ship out an ECD with less than two months left before the next wipe test is due. If the customer does not install the unit for awhile it is very possible to have a wipe test date which is close to or already expired.
At one time we had thought about wiping cells just prior to shipment, however, that would mean we would have to wait for the results and delay shipment up to two weeks. Obviously, this is unacceptable.

15. Why is an empty box(s) shipped inside of the GC oven?

The empty box(s) shipped inside the GC oven is the original box in which the ECD was packaged. This box has a label which contains important information including serial #, assay #, activity, and wipe test data. This data must be filed away by the customer!

16. My customer has placed their GC in storage. Does the ECD have to be wiped tested every six months?

When in storage, or out of service, the ECD does not have to be wipe tested every six months. A note should be placed in the wipe test file documenting the date the unit was taken out of service. If placed back into service a wipe should be immediately taken and the wipe test file should be updated to show the unit was placed back into use.

17. My customer is requesting a letter from Perkin-Elmer stating that the company will accept back the ECD at the end of the life of the product. Do we have such a letter?

As stated earlier, PE is not a disposal site nor do we want to be the middle man in the disposal scenario. Attached is a letter from NRD Inc. stating that they are the original manufacturer of the radioactive source and will accept Perkin-Elmer ECDs for disposal.

This letter should be used for customers that need this type of documentation.

18. Where can my customer find information concerning their responsibilities when under the PE general license?

All the GC operator's manuals since 1982 have a section in them with reprints of the appropriate NRC regulations concerning ECDs.

9 Hazards

As with any gas chromatograph, care must be taken to ensure that the apparatus is safe in all respects. The following areas should receive specific attention:

9A. COMPRESSED GASES

Cylinders (tanks) of compressed gases should be handled with caution. Avoid knocking the valves, and ensure that the correct valves and gauges are installed. It is recommended that gas cylinders be stored and sited outside the laboratory and connected to the instrument through copper lines. Take care not to kink or stress the gas lines. For safety, cylinders should be firmly clamped in position.

When hydrogen is used, either as the combustion gas for a flame ionization detector or as carrier gas with a hot wire detector, special care must be taken to avoid the build up of explosive hydrogen/air mixtures. Ensure that all couplings used in the hydrogen lines are leak free, and do not allow hydrogen to vent within the oven.

9B. VENTILATION

Adequate ventilation must be provided, particularly if a carbon dioxide Subambient Accessory is in constant use. When analyzing hazardous compounds, such as pesticides, it may be necessary to arrange for the detector effluent to be vented in a fume hood.

To ensure adequate cooling of the instrument electronics, do not obstruct the gap at the base of the instrument, and leave at least 6-in. clearance between instruments.

9C. ELECTRICITY

Ensure that the power cord is wired correctly, and that the ground leads of all electrical units (e.g., recorders, integrators) are connected together via the circuit ground to earth. Use only 3-prong outlets, with common earth ground connections.

Servicing should be performed only by a Perkin-Elmer Service Engineer or similarly authorized person.

The instrument must be unplugged from line power before any panels are removed.

9D. RADIOACTIVE MATERIALS

The Electron Capture Detector incorporates a radioactive source. Users of this detector are required to familiarize themselves with the current regulations governing the use of radioactive materials in their particular country, and should ensure that their procedures comply with the requirements of those regulations. For registration purposes, a source serial number is stamped on the outside of the ECD cell housing. In the U.S., owners of the ECD must be licensed by the U.S. Nuclear Regulatory Commission (NRC) and/or, in some states, by the equivalent state agency. For further information, contact the Customer Service Department at the Perkin-Elmer Corp., Norwalk, Connecticut, or the NRC Material Branch, Office of Nuclear Materials, Safety and Safeguards, Washington, D.C. 20555. Specify Perkin-Elmer Electron Capture Detector, Part No. 330-0119. The owner should indicate on his license application that he intends to perform periodic wipe-tests on the detector in accordance with NRC requirements (refer to Section 10).

In the U.K., registration is required under the Radioactive Substances Act 1960, for anyone keeping or using radioactive materials. Application should be made to one of the following governing bodies:

ENGLAND -	Department of the Environment Queen Anne's Chambers Tothill Street London, SW1H 9J4
SCOTLAND -	Scottish Development Department 21 Hill Street Edinburgh, EH2 3J4
WALES -	Welsh Office Cathay's Park Cardiff, CF1 3NG
NORTHERN IRELAND -	Ministry of Development Parliament Building Stormont Belfast, Northern Ireland

When the equipment is used in research or teaching establishments, the user's attention is especially directed to the 'Code of Practice for the protection of persons exposed to ionizing radiations in Research and Teaching'. Further advice may be obtained from:

D) FPD Maintenance

1) Switch off the photomultiplier tube and turn off the combustion gases.

2) Remove the detector block outer cover.

3) Uncouple the light guide (Figure 10-4) at the detector (3/8-in. fitting).

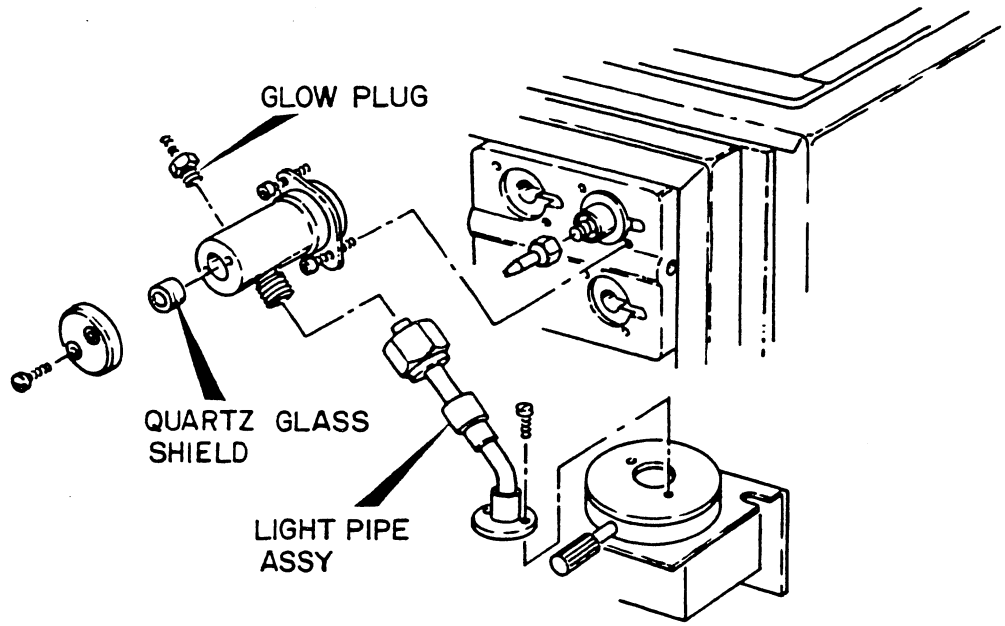


Figure 10-4. Dismantling the FPD

4) Disconnect the detector plug from the bracket below the detector.

5) Remove the end cap and the whole cap assembly. Scrape off any deposits from the cap.

6) Remove the thermal insulation from around the detector body and unscrew the two screws that are then exposed. The detector body may then be pulled off the detector block.

7) Remove the jet using a suitable wrench and clean it with a soft tool (piece of wood) and methylene chloride. Do not poke metal objects into the jet. Replacement jets (Part No. 330-0194) are available if required.

8) Pull off the electrical connections for the ignition plug on the detector body, and partially unscrew the plug. Invert the body and the glass heat shield will slide out from the top of the body. Clean the glass with chromic acid. Replacement heat shields (Part No. 045-1417) are available if required.

9) Reassemble the detector following the above procedure in the reverse order.

E) ECD Cleaning and Maintenance Procedure

1) Bake-Out Procedure

It is often possible to decontaminate the ECD by purging it with carrier gas using a flow rate of 50 to 100 cm^3/min. and raising the temperature to 400°C. These conditions should then be maintained until the detector is clean. Periodically, plot a graph of standing current setting versus frequency, as described in the Practical Gas Chromatography Manual. The plot should improve as cleaning progresses, but complete cleaning may require baking for several hours or even days, depending on the type and extent of contamination.

> **Important:** Never attempt to flush the detector cell assembly with acidic solvents, as this will result in the removal of radioactive material from the cell.

2) Wipe Test

The United States Nuclear Regulatory Commission requires that the detector be wipe tested at least once every six months, and that a record of the results of these tests be maintained for NRC inspection. The purpose of the wipe test is to ensure that removable radioactive contamination on the external parts of the cell remains at a safe level.

> **Important:** Until the results of the wipe test are known, assume that the cell is contaminated and handle it only with suitable protection. All equipment coming into contact with the cell should be considered contaminated and handled accordingly.

It is strongly recommended that the user become familiar with the NRC regulations covering the use of nickel-63, as well as any other national, state or local requirements.

Note: The NRC wipe test is not required in the U.K.

Perform the wipe test as follows:

1) Switch the instrument off and allow the detector to cool.

2) Expose the detector by pulling the detector cover forward and downward. The cover may be detached completely if required.

3) Pull off the collector housing (Figure 10-5).

> **Warning:** DO NOT DISMANTLE THE CELL.

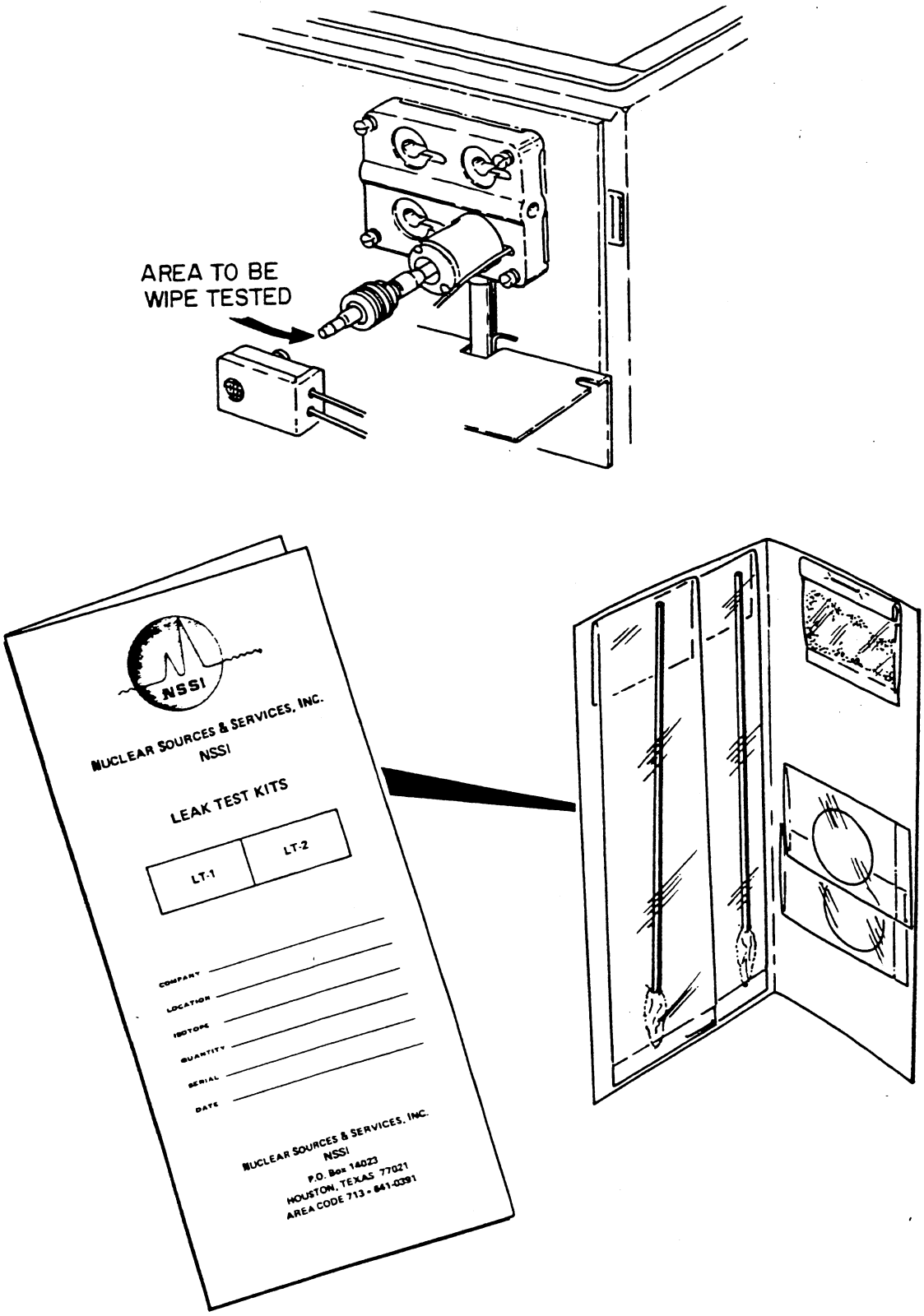


Figure 10-5 - The ECD Wipe Test

4) Refer to the instructions included with the wipe test kit (Part No. 009-1667) supplied with the detector, and wipe the external surfaces of the cell, as shown in Figure 10-5. Once the wipe test paper has been moistened and any part of the cell has been wiped, do not re-moisten the paper. Also, do not allow any of the wipe test solution to enter the cell.

5) Put the paper in the container provided in the wipe test kit. Include a data sheet stating that the wipe test was performed on a Perkin-Elmer electron capture detector cell, Part No. 330-0119, and give the date of the test. Return the container to either:

Nuclear Radiation Dev. Corp.
2937 Alt. Blvd.
Grand Island, N.Y.

or

Nuclear Sources and Service
5711 Etheridge
Houston, Texas 77017

Note: The sensitivity of the wipe test is 0.0001 microcuries.

Request that a new wipe test kit be forwarded with the test results.

To: Paul Angelis@SpecStaff
From: Joel Carlson@std
Cc: Jean Herbert@std,Joel Carlson@std,Scott Defazio@std
Bcc:
Subject: Gas Chromatograph with Ni63 Detector
Attachment:
Date: 3/26/97 8:20 AM

Paul,

I would like to remove the ancient Perkin Elmer Gas Chromatograph (Decal # 26009) from our property list. I would like to coordinate the turn-in of this chromatograph with ES&HO because it is embumbered with a radioactive Ni63 detector. Please advise.

Thank-you.

JCarlson

To: Joel Carlson@std
From: Paul Angelis@SpecStaff
Cc: Paul Angelis@SpecStaff,Scott Defazio@std
Bcc:
Subject: re: Electron Capture Detector - Ni63
Attachment:
Date: 4/14/97 11:55 AM

Joel,

John and I spoke last Wednesday when he returned from AL.

I will try to remind him again today.

Swipe - remove ECD - swipe again.

Thanks for your efforts,
//s//
Paul G. Angelis

Original text
From: Joel Carlson@std@natick, on 4/14/97 11:40 AM:
Paul,

Do you know if John Sieckarski has performed the wipe test on the Perkin Elmer Sigma 3 Electron Capture Detector (Decal #26009) located in R218-222?

JCarlson
5055

To: Scott Defazio@std
From: Joel Carlson@std
Cc: Jean Herbert@std,Joel Carlson@std,Paul Angelis@SpecStaff,Rosa Linda Bagalawis@surd
Bcc:
Subject: Turn - In; Gas Chromatograph R220 (Decal #26009)
Attachment:
Date: 4/15/97 3:03 PM

Scott,

The Perkin Elmer Sigma 3 Gas Chromatograph in R220 (Decal #26009) is ready to be turned-in. The radioactive (Ni63 ECD) detector has been removed and given to ES&HO.

JCarlson
5055

AMSSC-S-ENS 6 May 1997

MEMORANDUM FOR Mr. Douglas Abrams, Acting Director, Logistics Directorate

SUBJECT: Excess Laboratory Equipment, 15 mCi Ni-63 Radioactive Source Removed

1. Reference Perkin Elmer, Model - Sigma Series, Gas Chromatograph, Decal #26009.

2. Dr. Joel Carlson, S&TD, had notified this office that the above referenced equipment was identified as excess and that he wanted to process a turn-in for disposal. Prior to this action Dr. Carlson requested our assistance to remove and properly dispose of the radioactive sealed source contained within the item. In response to his request the Electron Capture Detector containing a 15 mCi Ni-63 radioactive sealed source was removed from the above referenced laboratory equipment by Mr. John Sieckarski, Alternate Radiation Protection Officer, on or about 15 April 1997.

3. Additionally, Mr. Sieckarski obtained swipe samples from the equipment and sealed source and analyzed these for residual removable radioactive contamination. Results confirm the sealed source integrity and no detectable radioactive contamination. Therefore this item may be transferred or disposed without further consideration of requirements of the U.S. Nuclear Regulatory Commission.

4. Should you have any questions please contact Mr. John F. Sieckarski at extension 4758 or I may be reached at extension 5208.

PAUL G. ANGELIS
Radiation Protection Officer

CF:
Dr. Joel Carlson, S&TD
Mr. John Sieckarski, ARPO, ESHO

E.I. DU PONT DE NEMOURS & CO. (INC.)
MEDICAL PRODUCTS DEPARTMENT

ATTACHMENT "A"

Issued To: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

NENC #: 15241330

Re.: NER-580, 1 X 8 mCi Co-60, S/N: C0356

Radioactivity Leakage/Contamination Test TEST DATE: 12/13/90

The source was tested for capsule contamination and radioactivity leakage immediately after manufacture, pursuant to ANSI standard N542-1977, Procedure A2.1.3, Immersion with Boiling Test. Less than 1.0×10^{-3} microcurie was detected.

A2.1.3 Immersion with Boiling Test - Immerse the sealed source in a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated to be effective in removing the radionuclide involved. Boil for ten minutes, remove the source retaining the solvent, and allow to cool, then rinse the source using fresh solvent. Repeat these operations twice, for a total of three tests, using the original solvent for the boiling. Measure the total activity in the solvent. If the activity is less than 5 nCi, the source is considered leak free.

Richard G.Tobin,Lead Technologist
Research & Industrial Sources
Nuclides & Sources Operations

RGT/ddk

MEDICAL PRODUCTS DEPARTMENT
331 Treble Cove Road, No. Billerica, MA 01862 Telephone 508-667-9531

E.I. du Pont de Nemours & Co.

DU PONT

CERTIFICATE OF SEALED SOURCE TEST

ISSUED TO: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

Source Model: NER-580

Capsule No. G316B

ANSI N5.10-1968 Performance Classification C54434

NENC NO. 15241330

PURCHASE ORDER NO. DAAK6090P2921

Nominal Radioactivity: 1 X 8 mCi

Radionuclide: Cobalt-60

Serial No.: C0356

Date of Mfr.: December 1990 (Engraved 11/90)

I.A.E.A. Certificate No. USA/0152/S

Radioassay

The source(s) radioactivity was measured on 12/13 19 90 and determined to be 8.0 millicuries ± ____%. The measurement value is based on ☒ Gamma Dose Rate 13.2 R/Hr/Cm/mCi ☐ Special measurement technique ☐ Photon Emission Rate _____ Photons/second/steradian.

Seal Integrity Test

The source(s) seal integrity was tested on 12/13 19 90 pursuant to the specifications of ANSI Standard N5.10-1968 Procedure No. B2.4 and/or special Procedure No. _____ as prescribed. Test indicated seal integrity.

Radioactivity Leakage/Contamination Test

The source(s) radioactivity leakage and contamination were tested immediately after manufacture, pursuant to ANSI standard N5. 10-1968 Procedure ☐ B2.1 Smear Test or ☐ B2.2. Immersion Test. Less than _____ microcurie was detected. See Attachment "A"

The test was again performed on N/A 19 _____ per Procedure ☐ B2.1 ☐ B2.2. Less than _____ microcurie was detected.

The source(s) radioactivity leakage and contamination were determined to be within the limits specified by applicable regulations and specifications.

Du Pont certifies that the herein described sealed source(s) have been manufactured in conformance with approved specifications and/or specification No. 313-39 Rev D issued by Du Pont.

DATE: December 17,1990

For Du Pont

By: Richard G. Tobin

Richard G.Tobin,Lead Technologist
Source Production

ANSI STANDARD N5.10-1968
Appendix B. Leak Test Methods
(Extracts)

Several methods of leak testing are acceptable to determine whether a sealed source meets or fails sealed source requirements.

B2.1. Wipe (Smear) Test. Wipe all external surfaces of the source thoroughly with a piece of filter paper or other suitable material of high wet strength and absorbent capacity, moistened with a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated to be effective in removing the radionuclide involved. Measure the total activity on the paper. If it is less than 0.005 microcurie, the source shall be considered to be free from surface radioactive contamination.

Store the source for at least 7 days and repeat the test. If the total activity on the wiping material is less than 0.005 microcurie the source shall be considered leak free.

B2.2. Immersion Test. Immerse the source in a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated effective in removing the radionuclide involved. Heat the solution to 50 ± 5°C. and hold it at this temperature for 4 hours. Remove the source and measure the total activity in the liquid. If the activity in the liquid is less than 0.005 microcurie, the source shall be considered leak free.

B2.4. Vacuum Test.

B2.4.1. Procedure. Place the source capsule in the leak-test chamber, making certain that it is completely submerged 2 inches below the fluid level.

Evacuate the leak-test chamber slowly to a minimum or 22 inches Hg vacuum (below atmosphere), observing for the positive indication of leaks through the evolution of bubbles from the source-capsule surface. Do not exceed 25 inches Hg vacuum. If no leaks are observed over a period of 5 minutes, the source shall be considered leak free.

E. I. du Pont de Nemours & Co.

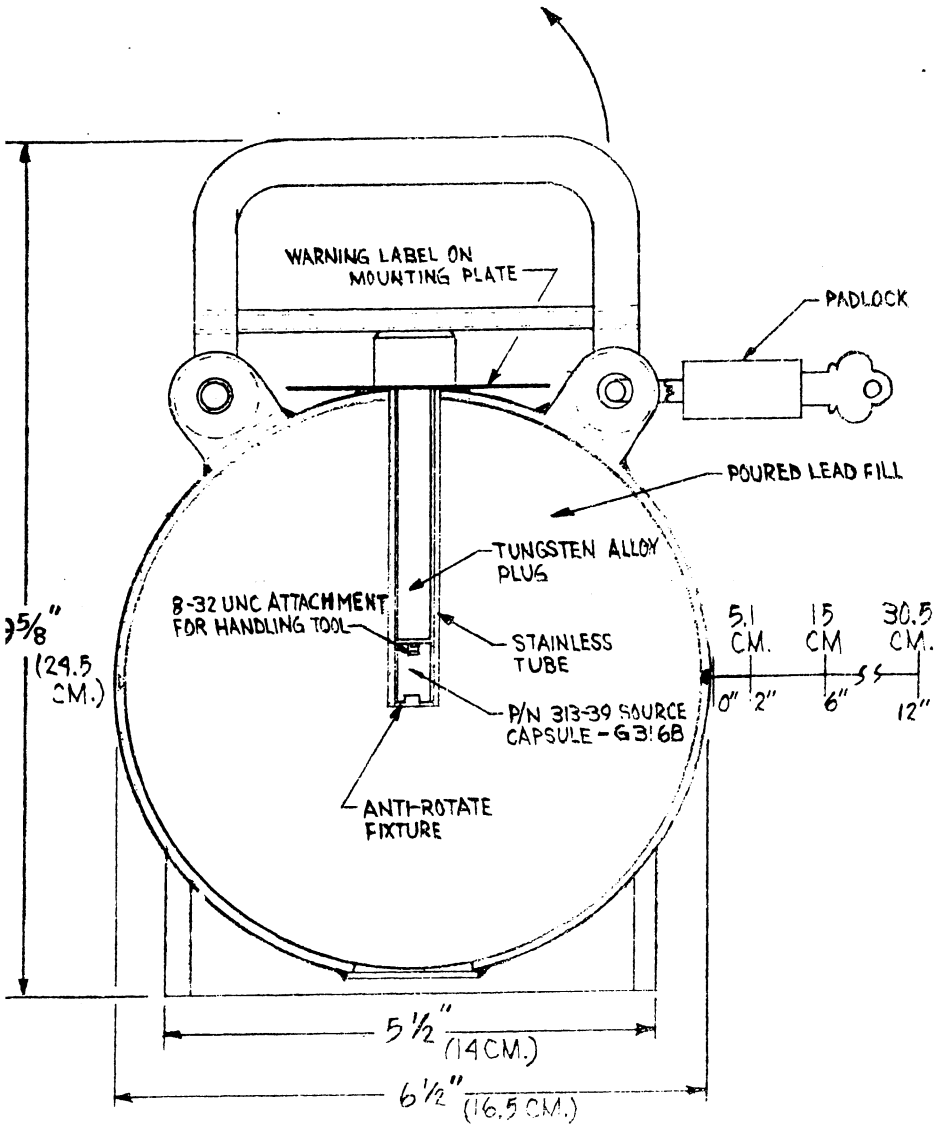
331 Treble Cove Road, N. Billerica, MA 01862
CALL TOLL-FREE: 800-225-1572 Telex: 94-0996
(In Massachusetts and International: 617-482-9595)

NEN Products
549 Albany St.
Boston, MA 02118
Telephone 800-225-1572
Mass. & International 617-482-9595

TECHNICAL DATA

INSTRUCTION SHEET FOR MODELS NER-400H AND NER-401H CALIBRATED SOURCE AND SHIELD SETS

The Du Pont NEN Products Models NER-400H and NER-401H calibrated source and shield sets are designed and constructed for easy use and minimum exposure. The shield and source weight of 27 kg (∿ 60 lbs) can easily be transported using the handle. The padlock prevents any unauthorized use of the calibrated source. Pictured below is the shield and source in the storage mode with approximate dose rates given in the table.



STORAGE-RADIATION DOSE RATES (mR/hr/mCi)

Source Nuclide	Co-60	Cs-137
At Shield Surface	2.8	0.01
2" (5.1cm) from Surface	1.0	0.01
6" (15cm) from Surface	0.31	0.01
12" (30.5cm) from Surface	0.11	0.01

Dose rates measured using TLD LIF chips 1.25 cm^2 (½" dia.)

Issued to: Acct.Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

Model No. NER-400H

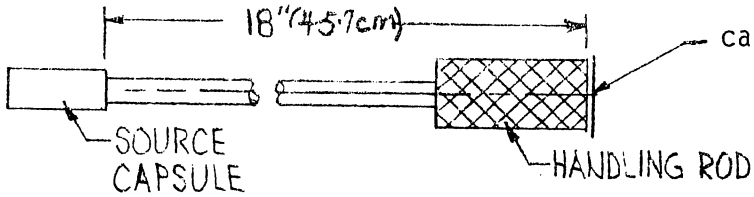
Serial No. C0356

Activity 8.0

Calibration Date Dec.13,1990

To remove the source from storage shield, first, place shield skirt on horizontal surface. Then unlock padlock and remove it from padlock hasp. After lifting the shield handle, pull out the tungsten plug. Insert source handling tool, thread side first, into the tube and thread it into the source sapsule. (NOTE: The anti-rotate fixture will prevent rotating the source capsule.) You may now remove the source.

Reverse the above precedure to return the source into the storage shield.



calculated dose rate:

^{60}Co ∿ 6.2 mR/hr/mCi

^{137}Cs ∿ 1.5 mR/hr/mCi

The Certificate of Calibration which accompanies the NER-400H and NER-401H states the calibrated dose rate value (± 4%)* of the source on the date of calibration. This dose rate value will diminish with time (t) as a function of the radionuclide decay ($t_{\frac{1}{2}}$), by the expression $I = I_0 e^{\frac{-(0.693)t}{t_{\frac{1}{2}}}}$.

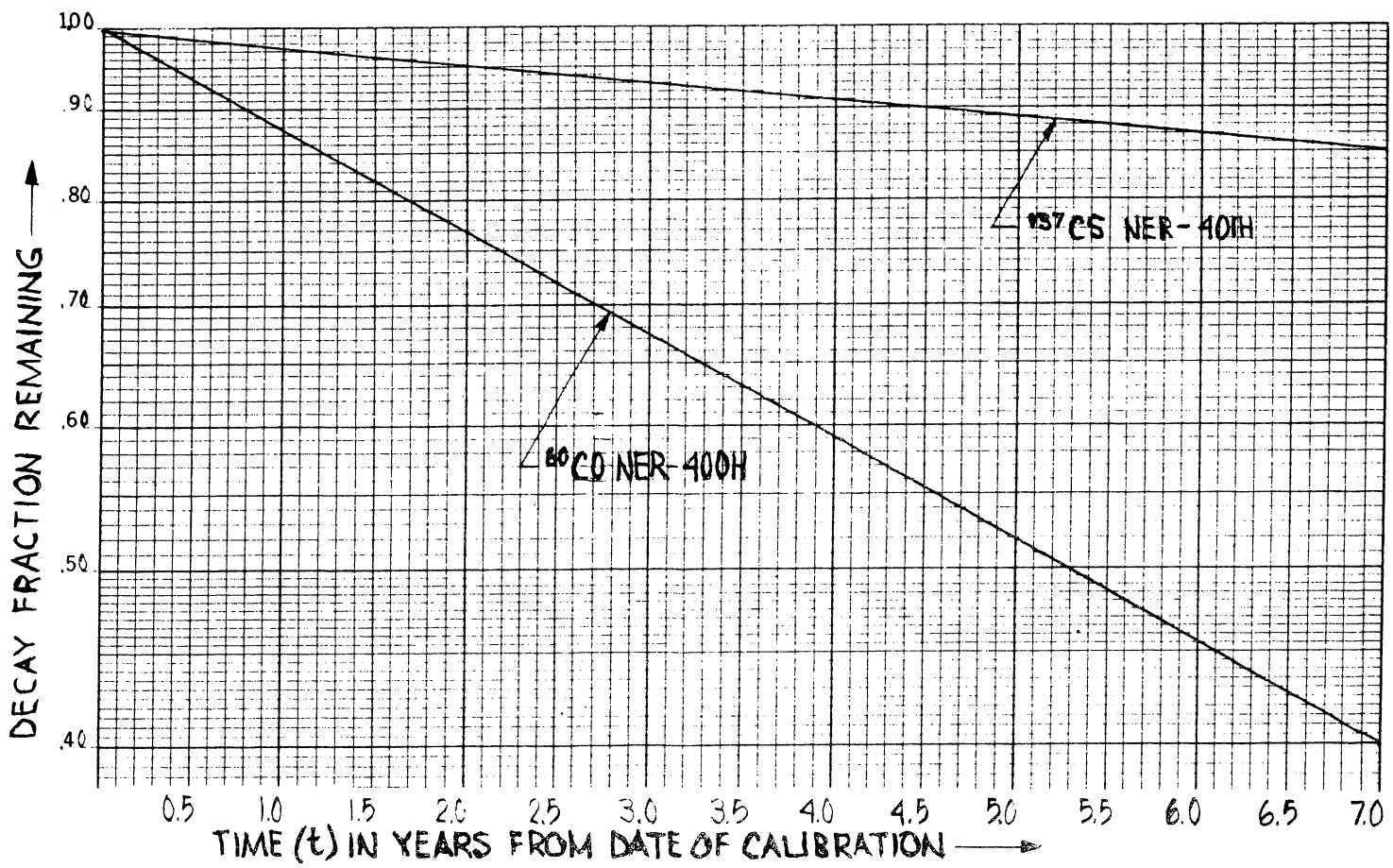
I = activity being determined for a given date.

I_0 = activity at the date of calibration.

t = elapsed time from date of calibration.

$t_{\frac{1}{2}}$ = 5.25 years for ^{60}Co and 30.0 years for ^{137}Cs.

The graph below describes the fraction remaining after a given time from the date of calibration.



*N.B.S. Traceable

NEN Products
549 Albany St.
Boston, MA 02118
Telephone 800-225-1572
Mass. & International 617-482-9595

TECHNICAL DATA

CERTIFICATE OF CALIBRATION
SEALED SOURCE GAMMA RADIATION DOSE RATE
FOR

XX MODEL NER-400H COBALT-60 SOURCE/SHIELD ASSEMBLY
____ MODEL NER-401H CESIUM-137 SOURCE/SHIELD ASSEMBLY

Issued To: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

Serial No.: C0356
NEN Order No.: 15241330
Calibration Date: Dec. 13 1990

The Gamma Ray Air Absorbtion Dose Rate resulting from radiation emission of the subject source was determined to be 10.57 milliroentgens per hour at an exposure point 1.0 meter (39.4") distant, approximately perpendicular to the capsule longitudinal axis center line.

The measurement was performed using a Precision Ionization Chamber/ Electrometer System for which the dose equivalent response of the subject source was developed by comparison with XX N.B.S. Cobalt-60 Dose Rate SourceStandard #47342 ____ N.B.S. Cesium-137 Dose Rate Source Standard #47455. The overall uncertainty of the measurement value is estimated to be ± 4%.

The Dose Rate Value listed will diminish as a function of the radionuclide decay, by the expression $I = I_0 e^{-.693T/T\,1/2}$. For purposes of the calculations, half-life values of 5.26 years for ^{60}Cobalt and 30.1 years for 137 Cesium, are recommended.

Du Pont NEN Products hereby certifies that the subject Radiation Source has been calibrated as represented by this report; that the contributing data has been checked and verified, and that the N.B.S. Standards traceability has been authenticated.

For: Du Pont NEN Products
Nuclides and Sources Division

By: K Henri 12/17/90
Nuclides and Sources Quality Assurance

Call toll free: 800-225-1572
(In Mass. and Int'l.: 617-482-9595 Telex: 94-0996

(In Massachusetts and International: 617-482-9595)
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CUSTOMER	SOLD TO
035953 01	COMMERCIAL ACCOUNTS OFFICE "U.S." ARMY NATICK RD&E CTR. ATTN: STRNC-CFPC N NATICK, MA 01760-5010 REPRINT

DELIVER TO	ACCT. PROP OFFICER-WHSE #20 U.S. ARMY NATICK RD&E CENTER KANSAS STREET N NATICK, MA 01760-5000
FINAL USER	
15241330	DAAK6090P2921
ORDER NO.	CUSTOMER PURCHASE ORDER NO.

If not deliverable, return to:
331 TREBLE COVE ROAD
N. BILLERICA, MA. 01862

PURCHASE ORDER NO.			
DAAK6090P2921			09/27/90 12:40
PAGE: 1	ORDER RECEIVED 09/27/90	SALESMAN 504	TERMS NET 30 DAYS

ANY QUESTIONS CONCERNING THIS ORDER CONTACT KATHY MULLIN

LICENSE NO.	ROUTE	
20-00315-02	FOB ORIGIN F.O.B.	
INSPECTOR	SHIPPED 12/18/90	RADIATION AT SURFACE

LINE NO.	CATALOG NO.	COMPOUND OR SERVICE	LOT NO.	NO. OF PACKAGES	PACKAGE SIZE	ESTIMATED SHIP DATE	QTY. SHIP
01	R580 0508	CO60 SEALED GAMMA SRC(CAPSULE) *GREATER THAN 7.5MCI LESS THAN *9.5 MCI		1	1EA	112790	1
04	R9996 0508	CHARGES FOR SPECIAL SERVICES *LEAD SHIELD AS NORMALLY PROVI -DED		1	1EA	112790	1
07	M008 9999	HANDLING CHARGE		1	1EA	112790	1

MATERIAL WILL NOT BE ACCEPTED FOR RETURN WITHOUT OUR PRIOR PERMISSION.
Seller represents that with respect to the production of the articles and/or the services covered by this invoice, it has fully complied with the provisions of the Fair Labor Standards Act of 1938, as amended.

PACKING LIST

MOORE BUSINESS FORMS INC R PATENT NO. 3,429,627

E.I. DU PONT DE NEMOURS & CO. (INC.)
MEDICAL PRODUCTS DEPARTMENT

ATTACHMENT "A"

Issued To: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

NENC #: 15241330

Re.: NER-580, 1 X 8 mCi Co-60, S/N: C0356

Radioactivity Leakage/Contamination Test TEST DATE: 12/13/90

The source was tested for capsule contamination and radioactivity leakage immediately after manufacture, pursuant to ANSI standard N542-1977, Procedure A2.1.3, Immersion with Boiling Test. Less than 1.0×10^{-3} microcurie was detected.

A2.1.3 Immersion with Boiling Test - Immerse the sealed source in a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated to be effective in removing the radionuclide involved. Boil for ten minutes, remove the source retaining the solvent, and allow to cool, then rinse the source using fresh solvent. Repeat these operations twice, for a total of three tests, using the original solvent for the boiling. Measure the total activity in the solvent. If the activity is less than 5 nCi, the source is considered leak free.

Richard G. Tobin, Lead Technologist
Research & Industrial Sources
Nuclides & Sources Operations

RGT/ddk

MEDICAL PRODUCTS DEPARTMENT
331 Treble Cove Road, No. Billerica, MA 01862 Telephone 508-667-9531

E.I. du Pont de Nemours & Co.

DU PONT

CERTIFICATE OF SEALED SOURCE TEST

ISSUED TO: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

NENC NO. 15241330

PURCHASE ORDER NO. DAAK6090P2921

Nominal Radioactivity: 1 X 8 mCi

Radionuclide: Cobalt-60

Source Model: NER-580

Serial No.: C0356

Capsule No. G316B

Date of Mfr.: December 1990 (Engraved 11/90)

ANSI N5.10-1968 Performance Classification C54434

I.A.E.A. Certificate No. USA/0152/S

Radioassay

The source(s) radioactivity was measured on 12/13 19 90 and determined to be 8.0 millicuries ± ____%. The measurement value is based on ☒ Gamma Dose Rate 13.2 R/Hr/Cm/mCi ☐ Special measurement technique ☐ Photon Emission Rate _____ Photons/second/steradian.

Seal Integrity Test

The source(s) seal integrity was tested on 12/13 19 90 pursuant to the specifications of ANSI Standard N5.10-1968 Procedure No. B2.4 and/or special Procedure No. _____ as prescribed. Test indicated seal integrity.

Radioactivity Leakage/Contamination Test

The source(s) radioactivity leakage and contamination were tested immediately after manufacture, pursuant to ANSI standard N5. 10-1968 Procedure ☐ B2.1 Smear Test or ☐ B2.2. Immersion Test. Less than _____ microcurie was detected. See Attachment "A"

The test was again performed on N/A 19 _____ per Procedure ☐ B2.1 ☐ B2.2. Less than _____ microcurie was detected.

The source(s) radioactivity leakage and contamination were determined to be within the limits specified by applicable regulations and specifications.

Du Pont certifies that the herein described sealed source(s) have been manufactured in conformance with approved specifications and/or specification No. 313-39 Rev D issued by Du Pont.

DATE: December 17,1990

For Du Pont

By: [signature]
Richard G.Tobin,Lead Technologist
Source Production

ANSI STANDARD N5.10-1968
Appendix B. Leak Test Methods
(Extracts)

Several methods of leak testing are acceptable to determine whether a sealed source meets or fails sealed source requirements.

B2.1. Wipe (Smear) Test. Wipe all external surfaces of the source thoroughly with a piece of filter paper or other suitable material of high wet strength and absorbent capacity, moistened with a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated to be effective in removing the radionuclide involved. Measure the total activity on the paper. If it is less than 0.005 microcurie, the source shall be considered to be free from surface radioactive contamination.

Store the source for at least 7 days and repeat the test. If the total activity on the wiping material is less than 0.005 microcurie the source shall be considered leak free.

B2.2. Immersion Test. Immerse the source in a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated effective in removing the radionuclide involved. Heat the solution to 50 ± 5°C. and hold it at this temperature for 4 hours. Remove the source and measure the total activity in the liquid. If the activity in the liquid is less than 0.005 microcurie, the source shall be considered leak free.

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B2.4.1. Procedure. Place the source capsule in the leak-test chamber, making certain that it is completely submerged 2 inches below the fluid level.

Evacuate the leak-test chamber slowly to a minimum or 22 inches Hg vacuum (below atmosphere), observing for the positive indication of leaks through the evolution of bubbles from the source-capsule surface. Do not exceed 25 inches Hg vacuum. If no leaks are observed over a period of 5 minutes, the source shall be considered leak free.

E. I. du Pont de Nemours & Co.

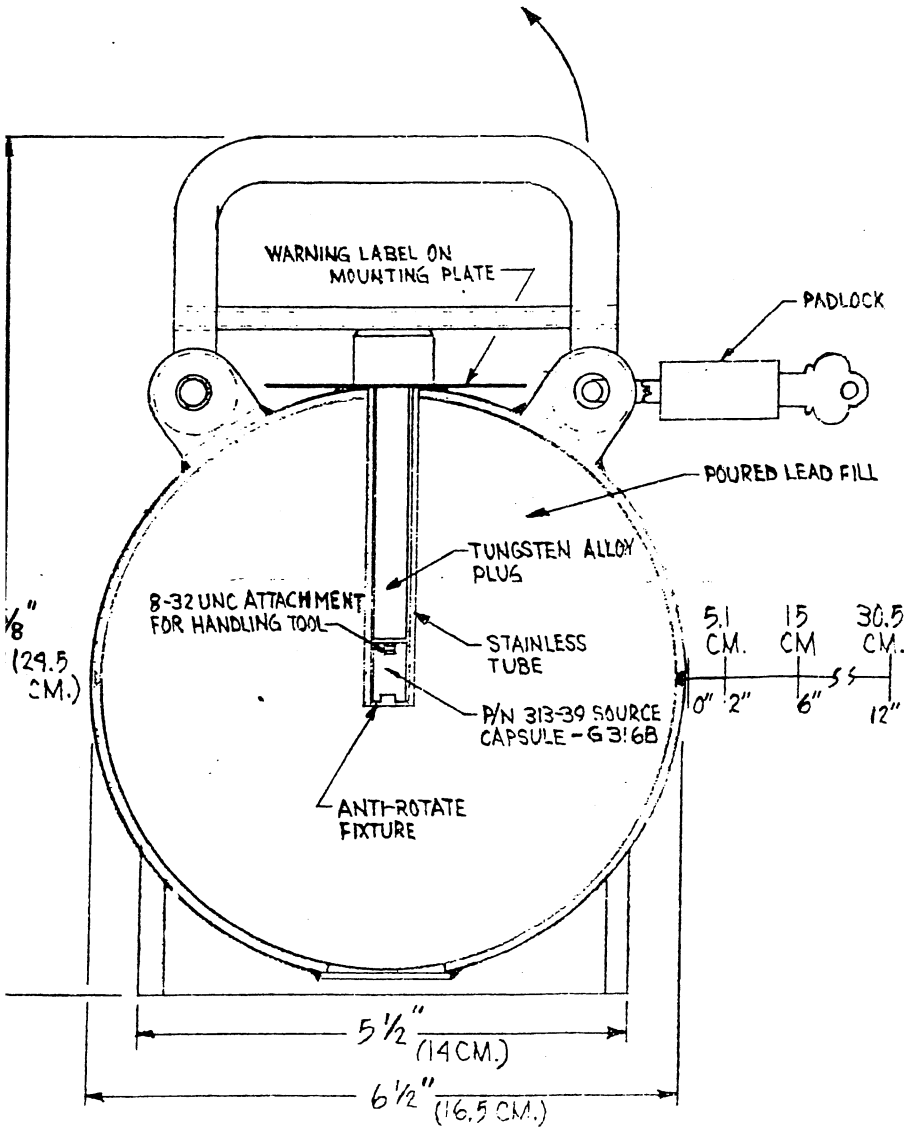
331 Treble Cove Road, N. Billerica, MA 01862
CALL TOLL-FREE: 800-225-1572 Telex: 94-0996
(In Massachusetts and International: 617-482-9595)

NEN Products
549 Albany St.
Boston, MA 02118
Telephone 800-225-1572
Mass. & International 617-482-9595

TECHNICAL DATA

INSTRUCTION SHEET FOR MODELS NER-400H AND NER-401H CALIBRATED SOURCE AND SHIELD SETS

The Du Pont NEN Products Models NER-400H and NER-401H calibrated source and shield sets are designed and constructed for easy use and minimum exposure. The shield and source weight of 27 kg (∿ 60 lbs) can easily be transported using the handle. The padlock prevents any unauthorized use of the calibrated source. Pictured below is the shield and source in the storage mode with approximate dose rates given in the table.



STORAGE-RADIATION DOSE RATES (mR/hr/mCi)

Source Nuclide	Co-60	Cs-137
At Shield Surface	2.8	0.01
2" (5.1cm) from Surface	1.0	0.01
6" (15cm) from Surface	0.31	0.01
12" (30.5cm) from Surface	0.11	0.01

Dose rates measured using TLD LIF chips 1.25 cm^2 (½" dia.)

Issued to: Acct.Prop Officer-Whse #20
U.S.Army Natick RD&E Cente
Kansas Street
Natick,MA 01760-5000

Model No. NER-400H

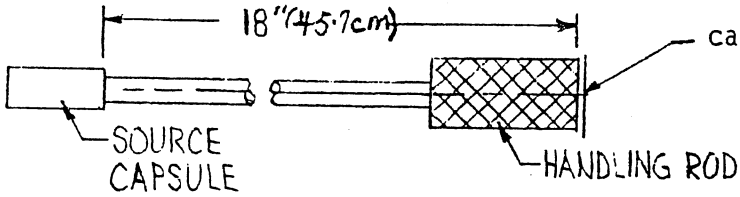
Serial No. C0356

Activity 8.0

Calibration Date Dec.13,1990

To remove the source from storage shield, first, place shield skirt on horizontal surface. Then unlock padlock and remove it from padlock hasp. After lifting the shield handle, pull out the tungsten plug. Insert source handling tool, thread side first, into the tube and thread it into the source sapsule. (NOTE: The anti-rotate fixture will prevent rotating the source capsule.) You may now remove the source.

Reverse the above precedure to return the source into the storage shield.



calculated dose rate:

^{60}Co ∿ 6.2 mR/hr/mCi

^{137}Cs ∿ 1.5 mR/hr/mCi

The Certificate of Calibration which accompanies the NER-400H and NER-401H states the calibrated dose rate value (± 4%)* of the source on the date of calibration. This dose rate value will diminish with time (t) as a function of the radionuclide decay ($t_{\frac{1}{2}}$), by the expression $I = I_0 e^{\frac{-(0.693)t}{t_{\frac{1}{2}}}}$.

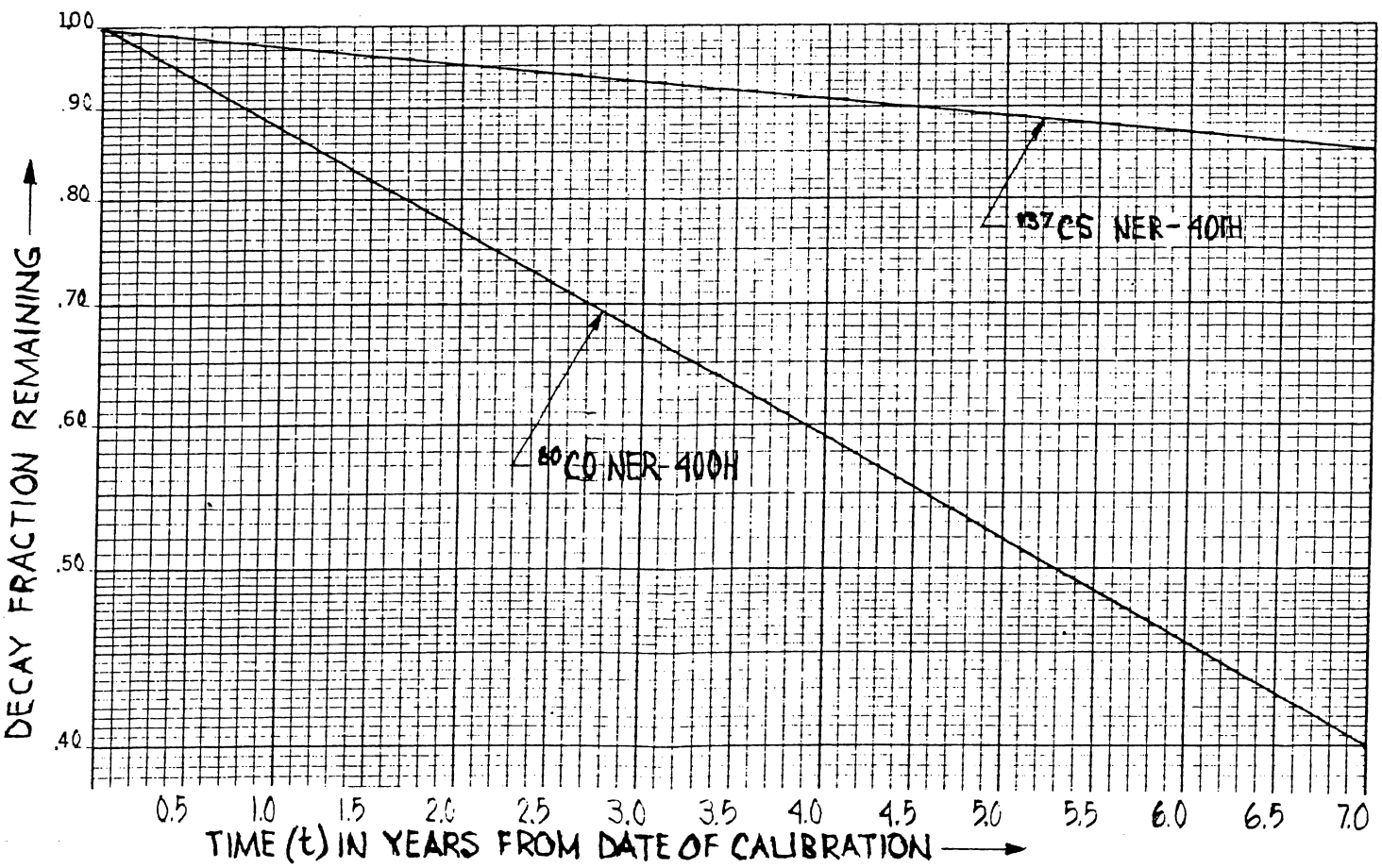
I = activity being determined for a given date.

I_0 = activity at the date of calibration.

t = elapsed time from date of calibration.

$t_{\frac{1}{2}}$ = 5.25 years for ^{60}Co and 30.0 years for ^{137}Cs.

The graph below describes the fraction remaining after a given time from the date of calibration.



*N.B.S. Traceable

NEN Products
549 Albany St.
Boston, MA 02118
Telephone 800-225-1572
Mass. & International 617-482-9595

TECHNICAL DATA

CERTIFICATE OF CALIBRATION
SEALED SOURCE GAMMA RADIATION DOSE RATE
FOR

XX MODEL NER-400H COBALT-60 SOURCE/SHIELD ASSEMBLY
____ MODEL NER-401H CESIUM-137 SOURCE/SHIELD ASSEMBLY

Issued To: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

Serial No.: C0356
NEN Order No.: 15241330
Calibration Date: Dec. 13 1990

The Gamma Ray Air Absorbtion Dose Rate resulting from radiation emission of the subject source was determined to be 10.57 milliroentgens per hour at an exposure point 1.0 meter (39.4") distant, approximately perpendicular to the capsule longitudinal axis center line.

The measurement was performed using a Precision Ionization Chamber/ Electrometer System for which the dose equivalent response of the subject source was developed by comparison with XX N.B.S. Cobalt-60 Dose Rate SourceStandard #47342 ____ N.B.S. Cesium-137 Dose Rate Source Standard #47455. The overall uncertainty of the measurement value is estimated to be ± 4%.

The Dose Rate Value listed will diminish as a function of the radionuclide decay, by the expression $I = I_0 e^{-.693T/T\,1/2}$. For purposes of the calculations, half-life values of 5.26 years for ^{60}Cobalt and 30.1 years for 137 Cesium, are recommended.

Du Pont NEN Products hereby certifies that the subject Radiation Source has been calibrated as represented by this report; that the contributing data has been checked and verified, and that the N.B.S. Standards traceability has been authenticated.

For: Du Pont NEN Products
Nuclides and Sources Division

By: K. Henrich 12/17/90
Nuclides and Sources Quality Assurance

REQUEST FOR ISSUE OR TURN-IN
(DA PAM 710-2-1)

X ISSUE / TURN-IN | SHEET NO. 1 | NO. SHEETS 1

3. REQUEST NO. W13PPH 0235-01 05

4. VOUCHER NO.

1. SEND TO: Supply & Storage, US Army NRDEC

5. DATE MATERIEL REQUIRED: 19 Oct 90

6. DODAAC

7. PRIORITY

8. ACCOUNTING/FUNDING DATA: 0022058N0400026EB

2. REQUEST FROM: Paul Angelis, C, ISO, Bldg 30, Rm 100

9. END ITEM IDENT

9a. NAME/MANUFACTURER

9b. MODEL

9c. SERIAL NO.

*CODE — ISSUE: I—Initial, R—Replacement — TURN-IN: FWT—Fair Wear And Tear, RS—Report of Survey, EX—Excess, SC—Stmt of Charges

STOCK FUND

10. PUBLICATION: NONEXPENDABLE

11. JOB ORDER NO.

12. ITEM NO. a	STOCK NO. b	ITEM DESCRIPTION c (LCD)	UNIT OF ISSUE d	QUANTITY e	CODE* f	SUPPLY ACTION g	UNIT PRICE h	TOTAL COST i	j. POSTED DATE	BY
1	6630	Catalog #NER 400H								
		Cobalt-60 source Greater than 7.5 mc, less than 9.5 mc	ea	1			894.00	894.00		
2		Lead Shield	ea	1			1380.00	1380.00		
		NCR License #20-00315-02								
		JUSTIFICATION: Calibration source required by Nuclear Regulatory Commission to calibrate survey equipment and maintain compliance with the Nuclear Regulatory Commission.								
		SOURCE: E. I. DuPont 331 Treble Cove Road N. Billerica, MA 01862 1-671-8435 (Gerald Terdro								
		IPB ITEM								
							SHEET TOTAL 2274.00		GRAND TOTAL 2274.00	

13. ISSUE/TURN-IN "QUANTITY" COLM IS REQUESTED — DATE: 28 AUG 1990 — BY: RUTH E. FORTNER, IPBO

14. ISSUE QTY IN "SUPPLY ACTION" COLUMN — DATE — BY

15. REC QTY IN "SUPPLY ACTION" COLUMN — DATE — BY

DA FORM 3161 MAY 83 — REPLACES EDITION OF JUN 73 WHICH WILL BE USED UNTIL EXHAUSTED.

E. I. du Pont de Nemours & Co. (Inc.)
Medical Products Department

DU PONT

15241330

Call toll free: 800-225-1572
(In Mass. and Int'l.: 617-482-9595 Telex: 94-0996

CUSTOMER	SOLD TO
035953 01	COMMERCIAL ACCOUNTS OFFICE "U.S." ARMY NATICK RD&E CTR. ATTN: STRNC-CFPC N NATICK, MA 01760-5010 REPRINT

PURCHASE ORDER NO. DAAK6090P2921 | 09/27/90 12:40

PAGE:	ORDER RECEIVED	SALESMAN	TERMS
1	09/27/90	504	NET 30 DAYS

ANY QUESTIONS CONCERNING THIS ORDER CONTACT KATHY MULLIN

LICENSE NO.	ROUTE
20-00315-02	FOB ORIGIN F.O.B.

INSPECTOR	SHIPPED	RADIATION AT SURFACE
[signature]	12/18/90	20 mr/h

DU PONT

Call toll free: 800-225-1572 Telex: 94-0996
(In Massachusetts and International: 617-482-9595)
If not deliverable, return to:

DELIVER TO	ACCT. PROP OFFICER-WHSE #20 U.S. ARMY NATICK RD&E CENTER KANSAS STREET N NATICK, MA 01760-5000
FINAL USER	
15241330	DAAK6090P2921
ORDER NO.	CUSTOMER PURCHASE ORDER NO.

If not deliverable, return to:
331 TREBLE COVE ROAD
N. BILLERICA, MA. 01862

LINE NO.	CATALOG NO.	COMPOUND OR SERVICE	LOT NO.	NO. OF PACKAGES	PACKAGE SIZE	ESTIMATED SHIP DATE	QTY. SHIP
01	R580 0508	CO60 SEALED GAMMA SRC(CAPSULE) *GREATER THAN 7.5MCI LESS THAN *9.5 MCI		1	1EA	112790	1
04	R9996 0508	CHARGES FOR SPECIAL SERVICES *LEAD SHIELD AS NORMALLY PROVI -DED		1	1EA	112790	1
07	M008 9999	HANDLING CHARGE		1	1EA	112790	1

MATERIAL WILL NOT BE ACCEPTED FOR RETURN WITHOUT OUR PRIOR PERMISSION.
Seller represents that with respect to the production of the articles and/or the services covered by this invoice, it has fully complied with the provisions of the Fair Labor Standards Act of 1938, as amended.

PACKING LIST

MCP* MOORE BUSINESS FORMS, INC. R PATENT NO. 3,429,827

E.I. du Pont de Nemours & Co.

DU PONT

CERTIFICATE OF SEALED SOURCE TEST

ISSUED TO: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

NENC NO. 15241330

PURCHASE ORDER NO. DAAK6090P2921

Nominal Radioactivity: 1 X 8 mCi

Radionuclide: Cobalt-60

Source Model: NER-580

Serial No.: C0356

Capsule No. G316B

Date of Mfr.: December 1990 (Engraved 11/90)

ANSI N5.10-1968 Performance Classification C54434

I.A.E.A. Certificate No. USA/0152/S

Radioassay

The source(s) radioactivity was measured on 12/13 19 90 and determined to be 8.0 millicuries ± ___%. The measurement value is based on ☒ Gamma Dose Rate 13.2 R/Hr/Cm/mCi ☐ Special measurement technique ☐ Photon Emission Rate _____ Photons/second/steradian.

Seal Integrity Test

The source(s) seal integrity was tested on 12/13 19 90 pursuant to the specifications of ANSI Standard N5.10-1968 Procedure No. B2.4 and/or special Procedure No. _____ as prescribed. Test indicated seal integrity.

Radioactivity Leakage/Contamination Test

The source(s) radioactivity leakage and contamination were tested immediately after manufacture, pursuant to ANSI standard N5. 10-1968 Procedure ☐ B2.1 Smear Test or ☐ B2.2. Immersion Test. Less than _____ microcurie was detected. See Attachment "A"

The test was again performed on N/A 19 _____ per Procedure ☐ B2.1 ☐ B2.2. Less than _____ microcurie was detected.

The source(s) radioactivity leakage and contamination were determined to be within the limits specified by applicable regulations and specifications.

Du Pont certifies that the herein described sealed source(s) have been manufactured in conformance with approved specifications and/or specification No. 313-39 Rev D issued by Du Pont.

DATE: December 17,1990

For Du Pont

By: Richard G. Tobin

Richard G.Tobin,Lead Technologist
Source Production

ANSI STANDARD N5.10-1968
Appendix B. Leak Test Methods
(Extracts)

Several methods of leak testing are acceptable to determine whether a sealed source meets or fails sealed source requirements.

B2.1. Wipe (Smear) Test. Wipe all external surfaces of the source thoroughly with a piece of filter paper or other suitable material of high wet strength and absorbent capacity, moistened with a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated to be effective in removing the radionuclide involved. Measure the total activity on the paper. If it is less than 0.005 microcurie, the source shall be considered to be free from surface radioactive contamination.

Store the source for at least 7 days and repeat the test. If the total activity on the wiping material is less than 0.005 microcurie the source shall be considered leak free.

B2.2. Immersion Test. Immerse the source in a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated effective in removing the radionuclide involved. Heat the solution to 50 ± 5°C. and hold it at this temperature for 4 hours. Remove the source and measure the total activity in the liquid. If the activity in the liquid is less than 0.005 microcurie, the source shall be considered leak free.

B2.4. Vacuum Test.

B2.4.1. Procedure. Place the source capsule in the leak-test chamber, making certain that it is completely submerged 2 inches below the fluid level.

Evacuate the leak-test chamber slowly to a minimum or 22 inches Hg vacuum (below atmosphere), observing for the positive indication of leaks through the evolution of bubbles from the source-capsule surface. Do not exceed 25 inches Hg vacuum. If no leaks are observed over a period of 5 minutes, the source shall be considered leak free.

E. I. du Pont de Nemours & Co.

331 Treble Cove Road, N. Billerica, MA 01862
CALL TOLL-FREE: 800-225-1572 Telex: 94-0996
(In Massachusetts and International: 617-482-9595)

E.I. DU PONT DE NEMOURS & CO. (INC.)
MEDICAL PRODUCTS DEPARTMENT

ATTACHMENT "A"

Issued To: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

NENC #: 15241330

Re.: NER-580, 1 X 8 mCi Co-60, S/N: C0356

Radioactivity Leakage/Contamination Test TEST DATE: 12/13/90

The source was tested for capsule contamination and radioactivity leakage immediately after manufacture, pursuant to ANSI standard N542-1977, Procedure A2.1.3, Immersion with Boiling Test. Less than 1.0×10^{-3} microcurie was detected.

A2.1.3 Immersion with Boiling Test - Immerse the sealed source in a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated to be effective in removing the radionuclide involved. Boil for ten minutes, remove the source retaining the solvent, and allow to cool, then rinse the source using fresh solvent. Repeat these operations twice, for a total of three tests, using the original solvent for the boiling. Measure the total activity in the solvent. If the activity is less than 5 nCi, the source is considered leak free.

Richard G. Tobin, Lead Technologist
Research & Industrial Sources
Nuclides & Sources Operations

RGT/ddk

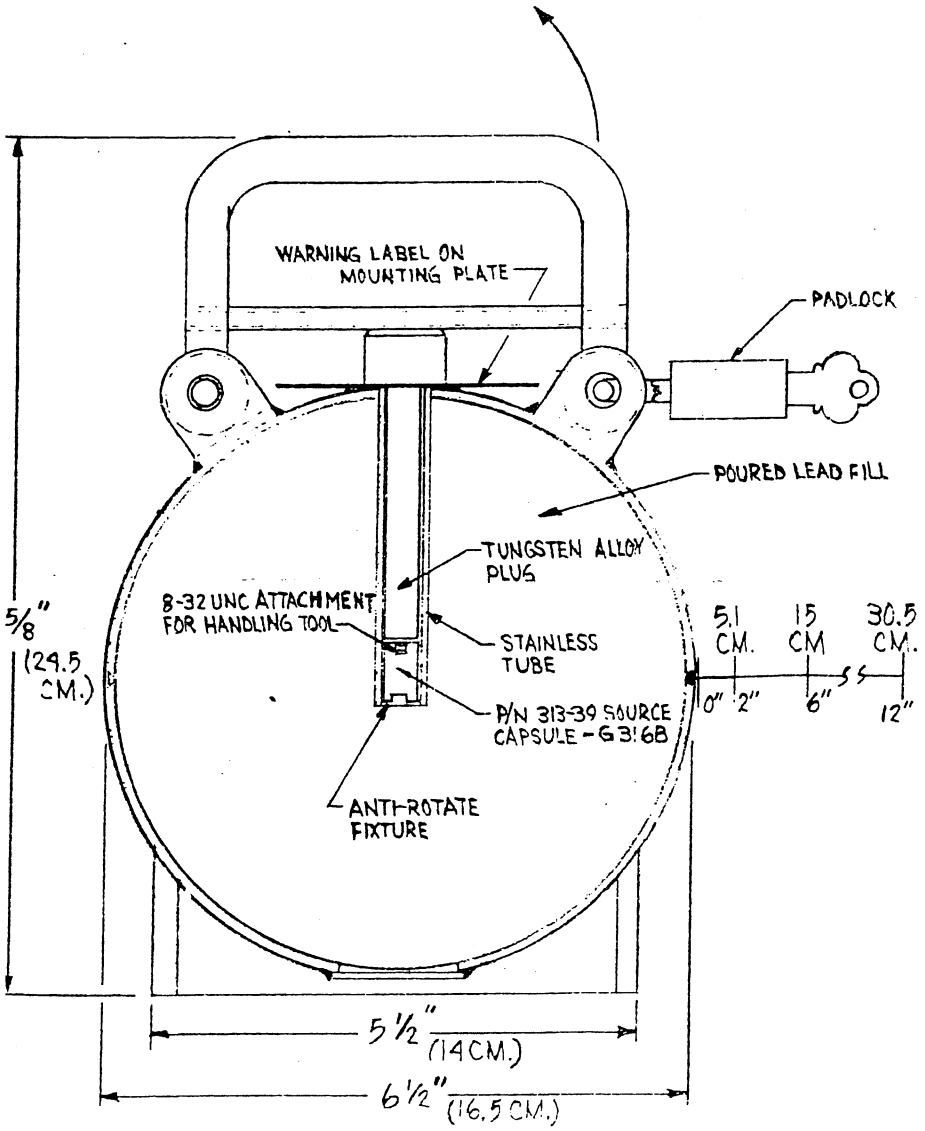
MEDICAL PRODUCTS DEPARTMENT
331 Treble Cove Road, No. Billerica, MA 01862 Telephone 508-667-9531

NEN Products
549 Albany St.
Boston, MA 02118
Telephone 800-225-1572
Mass. & International 617-482-9595

TECHNICAL DATA

INSTRUCTION SHEET FOR MODELS NER-400H AND NER-401H CALIBRATED SOURCE AND SHIELD SETS

The Du Pont NEN Products Models NER-400H and NER-401H calibrated source and shield sets are designed and constructed for easy use and minimum exposure. The shield and source weight of 27 kg (∿ 60 lbs) can easily be transported using the handle. The padlock prevents any unauthorized use of the calibrated source. Pictured below is the shield and source in the storage mode with approximate dose rates given in the table.



STORAGE-RADIATION DOSE RATES (mR/hr/mCi)

Source Nuclide	Co-60	Cs-137
At Shield Surface	2.8	0.01
2" (5.1cm) from Surface	1.0	0.01
6" (15cm) from Surface	0.31	0.01
12" (30.5cm) from Surface	0.11	0.01

Dose rates measured using TLD LIF chips 1.25 cm^2 (½" dia.)

Issued to: Acct.Prop Officer-Whse #20
U.S.Army Natick RD&E Cente
Kansas Street
Natick, MA 01760-5000

Model No. NER-400H

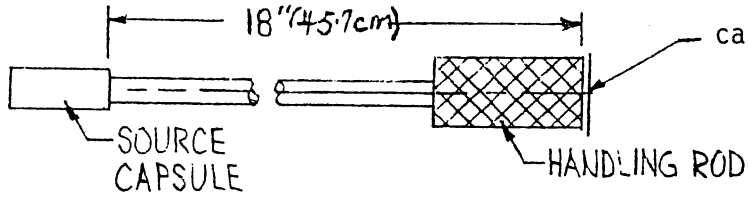
Serial No. C0356

Activity 8.0

Calibration Date Dec.13,1990

To remove the source from storage shield, first, place shield skirt on horizontal surface. Then unlock padlock and remove it from padlock hasp. After lifting the shield handle, pull out the tungsten plug. Insert source handling tool, thread side first, into the tube and thread it into the source sapsule. (NOTE: The anti-rotate fixture will prevent rotating the source capsule.) You may now remove the source.

Reverse the above precedure to return the source into the storage shield.



calculated dose rate:

^{60}Co ~ 6.2 mR/hr/mCi

^{137}Cs ~ 1.5 mR/hr/mCi

The Certificate of Calibration which accompanies the NER-400H and NER-401H states the calibrated dose rate value (± 4%)* of the source on the date of calibration. This dose rate value will diminish with time (t) as a function of the radionuclide decay ($t_{1/2}$), by the expression $I = I_0 e^{\frac{-(0.693)t}{t_{1/2}}}$.

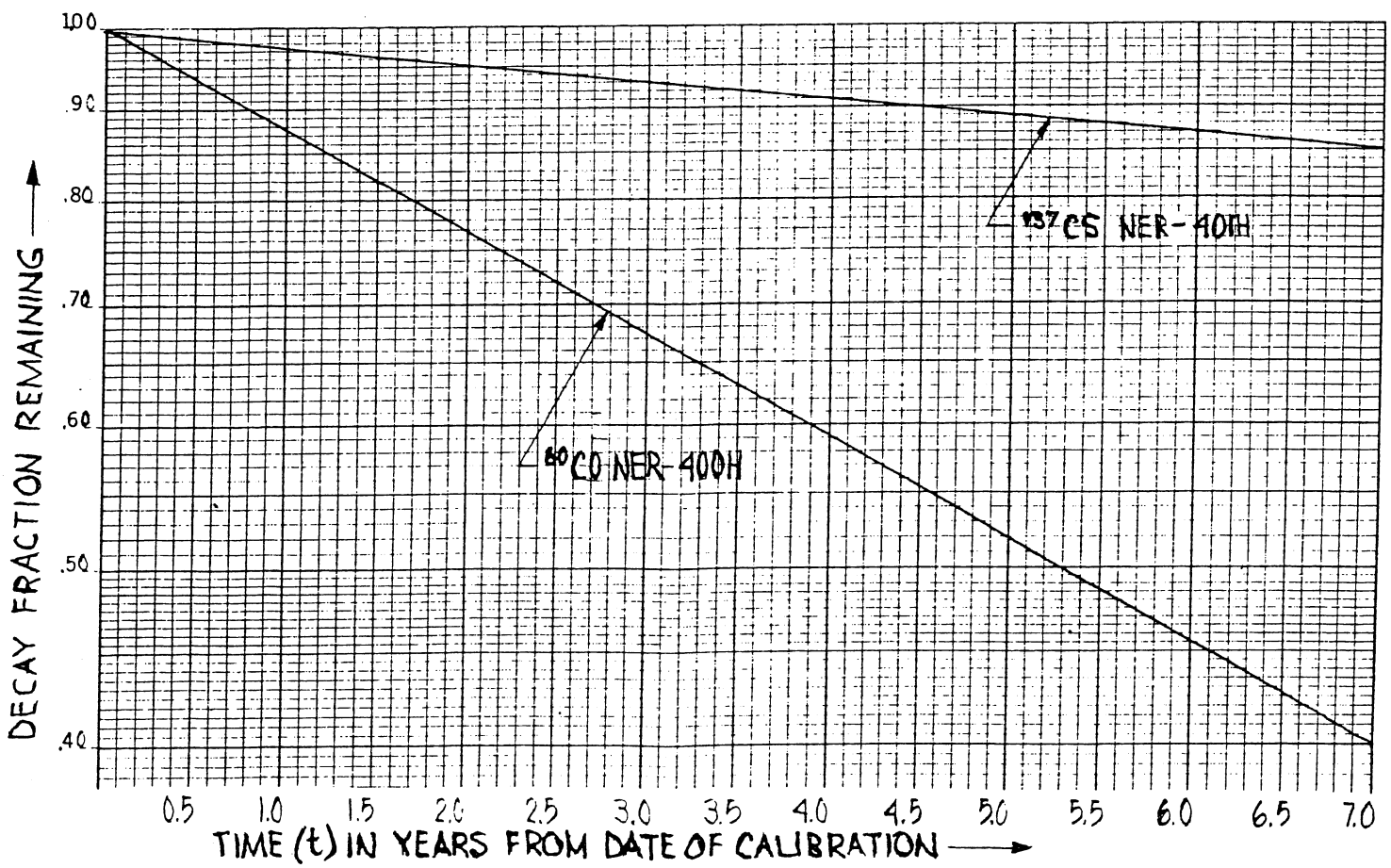
I = activity being determined for a given date.

I_0 = activity at the date of calibration.

t = elapsed time from date of calibration.

$t_{1/2}$ = 5.25 years for ^{60}Co and 30.0 years for ^{137}Cs.

The graph below describes the fraction remaining after a given time from the date of calibration.



*N.B.S. Traceable

NEN Products
549 Albany St.
Boston, MA 02118
Telephone 800-225-1572
Mass. & International 617-482-9595

TECHNICAL DATA

CERTIFICATE OF CALIBRATION
SEALED SOURCE GAMMA RADIATION DOSE RATE
FOR

XX MODEL NER-400H COBALT-60 SOURCE/SHIELD ASSEMBLY
____ MODEL NER-401H CESIUM-137 SOURCE/SHIELD ASSEMBLY

Issued To: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

Serial No.: C0356
NEN Order No.: 15241330
Calibration Date: Dec. 13 1990

The Gamma Ray Air Absorbtion Dose Rate resulting from radiation emission of the subject source was determined to be 10.57 milliroentgens per hour at an exposure point 1.0 meter (39.4") distant, approximately perpendicular to the capsule longitudinal axis center line.

The measurement was performed using a Precision Ionization Chamber/ Electrometer System for which the dose equivalent response of the subject source was developed by comparison with XX N.B.S. Cobalt-60 Dose Rate SourceStandard #47342 ____ N.B.S. Cesium-137 Dose Rate Source Standard #47455. The overall uncertainty of the measurement value is estimated to be ± 4%.

The Dose Rate Value listed will diminish as a function of the radionuclide decay, by the expression $I = I_0 e^{-.693T/T\,1/2}$. For purposes of the calculations, half-life values of 5.26 years for ^{60}Cobalt and 30.1 years for 137 Cesium, are recommended.

Du Pont NEN Products hereby certifies that the subject Radiation Source has been calibrated as represented by this report; that the contributing data has been checked and verified, and that the N.B.S. Standards traceability has been authenticated.

For:Du Pont NEN Products
Nuclides and Sources Division

By: K Henrik 12/17/90
Nuclides and Sources Quality Assurance

E.I. du Pont de Nemours & Co.

DU PONT

CERTIFICATE OF SEALED SOURCE TEST

ISSUED TO: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

NENC NO. 15241330

PURCHASE ORDER NO. DAAK6090P2921

Nominal Radioactivity: 1 X 8 mCi

Radionuclide: Cobalt-60

Source Model: NER-580

Serial No.: C0356

Capsule No. G316B

Date of Mfr.: December 1990 (Engraved 11/90)

ANSI N5.10-1968 Performance Classification C54434

I.A.E.A. Certificate No. USA/0152/S

Radioassay

The source(s) radioactivity was measured on 12/13 19 90 and determined to be 8.0 millicuries ± ___%. The measurement value is based on ☒ Gamma Dose Rate 13.2 R/Hr/Cm/mCi ☐ Special measurement technique ☐ Photon Emission Rate _____ Photons/second/steradian.

Seal Integrity Test

The source(s) seal integrity was tested on 12/13 19 90 pursuant to the specifications of ANSI Standard N5.10-1968 Procedure No. B2.4 and/or special Procedure No. _____ as prescribed. Test indicated seal integrity.

Radioactivity Leakage/Contamination Test

The source(s) radioactivity leakage and contamination were tested immediately after manufacture, pursuant to ANSI standard N5. 10-1968 Procedure ☐ B2.1 Smear Test or ☐ B2.2. Immersion Test. Less than _____ microcurie was detected. See Attachment "A"

The test was again performed on N/A 19 _____ per Procedure ☐ B2.1 ☐ B2.2. Less than _____ microcurie was detected.

The source(s) radioactivity leakage and contamination were determined to be within the limits specified by applicable regulations and specifications.

Du Pont certifies that the herein described sealed source(s) have been manufactured in conformance with approved specifications and/or specification No. 313-39 Rev D issued by Du Pont.

DATE: December 17,1990

For Du Pont

By: Richard G. Tobin

Richard G.Tobin,Lead Technologist
Source Production

ANSI STANDARD N5.10-1968
Appendix B. Leak Test Methods
(Extracts)

Several methods of leak testing are acceptable to determine whether a sealed source meets or fails sealed source requirements.

B2.1. Wipe (Smear) Test. Wipe all external surfaces of the source thoroughly with a piece of filter paper or other suitable material of high wet strength and absorbent capacity, moistened with a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated to be effective in removing the radionuclide involved. Measure the total activity on the paper. If it is less than 0.005 microcurie, the source shall be considered to be free from surface radioactive contamination.

Store the source for at least 7 days and repeat the test. If the total activity on the wiping material is less than 0.005 microcurie the source shall be considered leak free.

B2.2. Immersion Test. Immerse the source in a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated effective in removing the radionuclide involved. Heat the solution to $50 \pm 5°C$. and hold it at this temperature for 4 hours. Remove the source and measure the total activity in the liquid. If the activity in the liquid is less than 0.005 microcurie, the source shall be considered leak free.

B2.4. Vacuum Test.

B2.4.1. Procedure. Place the source capsule in the leak-test chamber, making certain that it is completely submerged 2 inches below the fluid level.

Evacuate the leak-test chamber slowly to a minimum or 22 inches Hg vacuum (below atmosphere), observing for the positive indication of leaks through the evolution of bubbles from the source-capsule surface. Do not exceed 25 inches Hg vacuum. If no leaks are observed over a period of 5 minutes, the source shall be considered leak free.

E. I. du Pont de Nemours & Co.

331 Treble Cove Road, N. Billerica, MA 01862
CALL TOLL-FREE: 800-225-1572 Telex: 94-0996
(In Massachusetts and International: 617-482-9595)

SHIPPING PAPER AND NOTIFICATION FOR LOADING OF DANGEROUS GOODS (PART B)

5

PRESS HARD – 5 PART FORM –USE BALL POINT PEN ONLY

No.	Proper Shipping Name	Division or Class	U.N. or I.D. No.	Subsidiary Risk	Net Qty.	Pkg. Inst.
1	RADIOACTIVE MATERIAL,N.O.S.	7	UN2982			

Isotope	Phys/Chem Form	Activity	Label	T.I.	Box Dim. (If Applic.)	Airbill No.	Container No./ Belly Comp. In	Out
I-125	SOLID/SALT	.296 GBq	II Yellow	.5	38x38 x38cm		A3	

Origin	Dest.	Shipment Type (Delete Non-Applicable)		This Shipment Is Within The Limitations Prescribed For: (Delete Non-Applicable)		Remarks
PMX	MC	~~Radioactive~~	Radioactive	Passenger Aircraft	~~Cargo Aircraft Only~~	SO#S1330

IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS OR TREATMENT. I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME AND ARE CLASSIFIED, PACKED, MARKED, AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY AIR ACCORDING TO THE APPLICABLE INTERNATIONAL AND NATIONAL GOVERNMENT REGULATIONS.

DISTRIBUTION:
1. RAMP
2. CAPTAIN/INBOUND FLIGHT (Travel to Destination, File in Hub)
3. OUTBOUND FLIGHT (Travel to Destination)
4. FILE IN HUB
5. STAY WITH PACKAGE

Shipper/Title of Shipper	Place/Date	Telephone No.
GARY LAW (ACCT#0021-0028-2)	12/18/90	508-667-9531

FedEx M-0390CR 1/89

E.I. DU PONT DE NEMOURS & CO. (INC.)
MEDICAL PRODUCTS DEPARTMENT

ATTACHMENT "A"

Issued To: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

NENC #: 15241330

Re.: NER-580, 1 X 8 mCi Co-60, S/N: C0356

Radioactivity Leakage/Contamination Test TEST DATE: 12/13/90

The source was tested for capsule contamination and radioactivity leakage immediately after manufacture, pursuant to ANSI standard N542-1977, Procedure A2.1.3, Immersion with Boiling Test. Less than 1.0×10^{-3} microcurie was detected.

A2.1.3 Immersion with Boiling Test - Immerse the sealed source in a solvent which will not attack the material of which the outer surfaces of the source are made and which, under the conditions of this test, has been demonstrated to be effective in removing the radionuclide involved. Boil for ten minutes, remove the source retaining the solvent, and allow to cool, then rinse the source using fresh solvent. Repeat these operations twice, for a total of three tests, using the original solvent for the boiling. Measure the total activity in the solvent. If the activity is less than 5 nCi, the source is considered leak free.

Richard G. Tobin

Richard G.Tobin,Lead Technologist
Research & Industrial Sources
Nuclides & Sources Operations

RGT/ddk

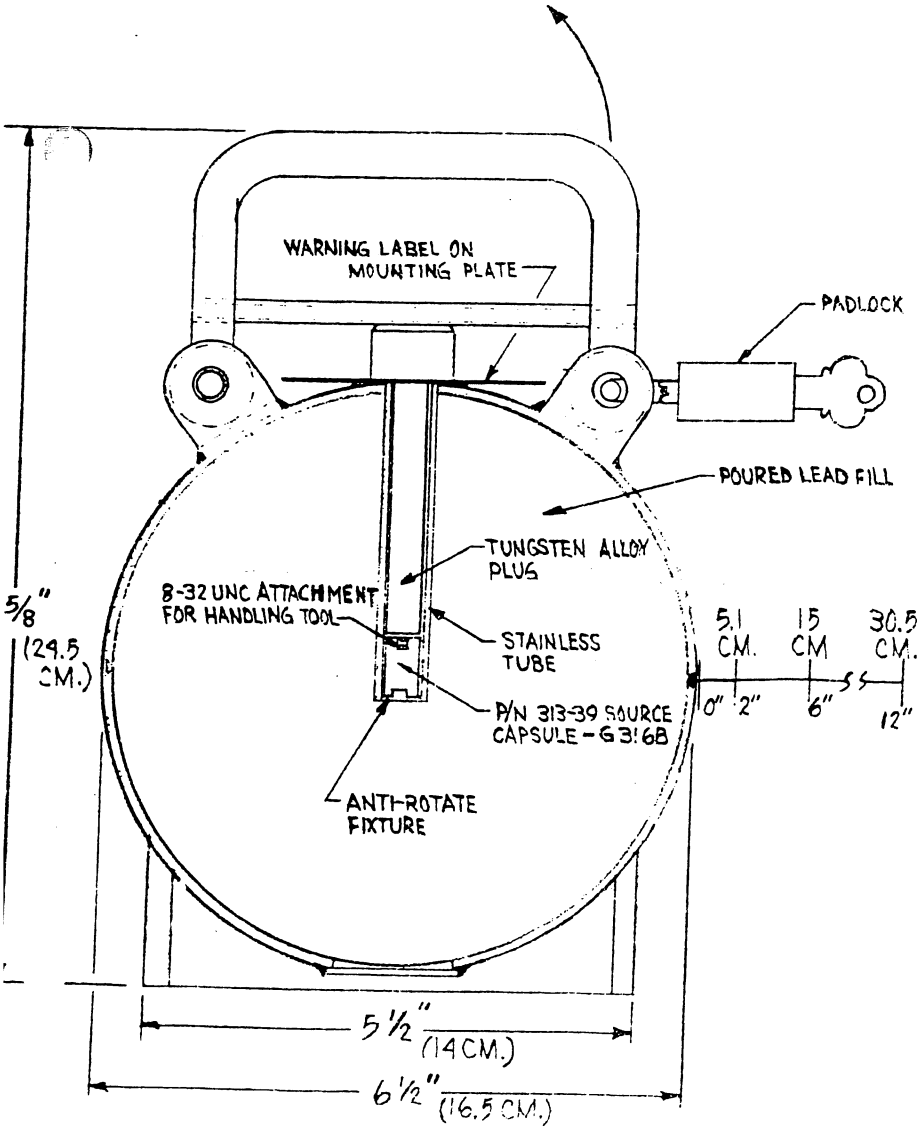
MEDICAL PRODUCTS DEPARTMENT
331 Treble Cove Road, No. Billerica, MA 01862 Telephone 508-667-9531

NEN Products
549 Albany St.
Boston, MA 02118
Telephone 800-225-1572
Mass. & International 617-482-9595

TECHNICAL DATA

INSTRUCTION SHEET FOR MODELS NER-400H AND NER-401H CALIBRATED SOURCE AND SHIELD SETS

The Du Pont NEN Products Models NER-400H and NER-401H calibrated source and shield sets are designed and constructed for easy use and minimum exposure. The shield and source weight of 27 kg (∿ 60 lbs) can easily be transported using the handle. The padlock prevents any unauthorized use of the calibrated source. Pictured below is the shield and source in the storage mode with approximate dose rates given in the table.



STORAGE-RADIATION DOSE RATES (mR/hr/mCi)

Source Nuclide	Co-60	Cs-137
At Shield Surface	2.8	0.01
2" (5.1cm) from Surface	1.0	0.01
6" (15cm) from Surface	0.31	0.01
12" (30.5cm) from Surface	0.11	0.01

Dose rates measured using TLD LIF chips 1.25 cm^2 (½" dia.)

Issued to: Acct.Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

Model No. NER-400H

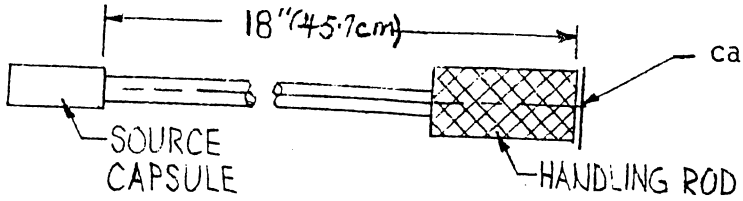
Serial No. C0356

Activity 8.0

Calibration Date Dec.13,1990

To remove the source from storage shield, first, place shield skirt on horizontal surface. Then unlock padlock and remove it from padlock hasp. After lifting the shield handle, pull out the tungsten plug. Insert source handling tool, thread side first, into the tube and thread it into the source sapsule. (NOTE: The anti-rotate fixture will prevent rotating the source capsule.) You may now remove the source.

Reverse the above precedure to return the source into the storage shield.



calculated dose rate:

^{60}Co ~ 6.2 mR/hr/mCi

^{137}Cs ~ 1.5 mR/hr/mCi

The Certificate of Calibration which accompanies the NER-400H and NER-401H states the calibrated dose rate value (± 4%)* of the source on the date of calibration. This dose rate value will diminish with time (t) as a function of the radionuclide decay ($t_{1/2}$), by the expression $I = I_0 e^{\frac{-(0.693)t}{t_{1/2}}}$.

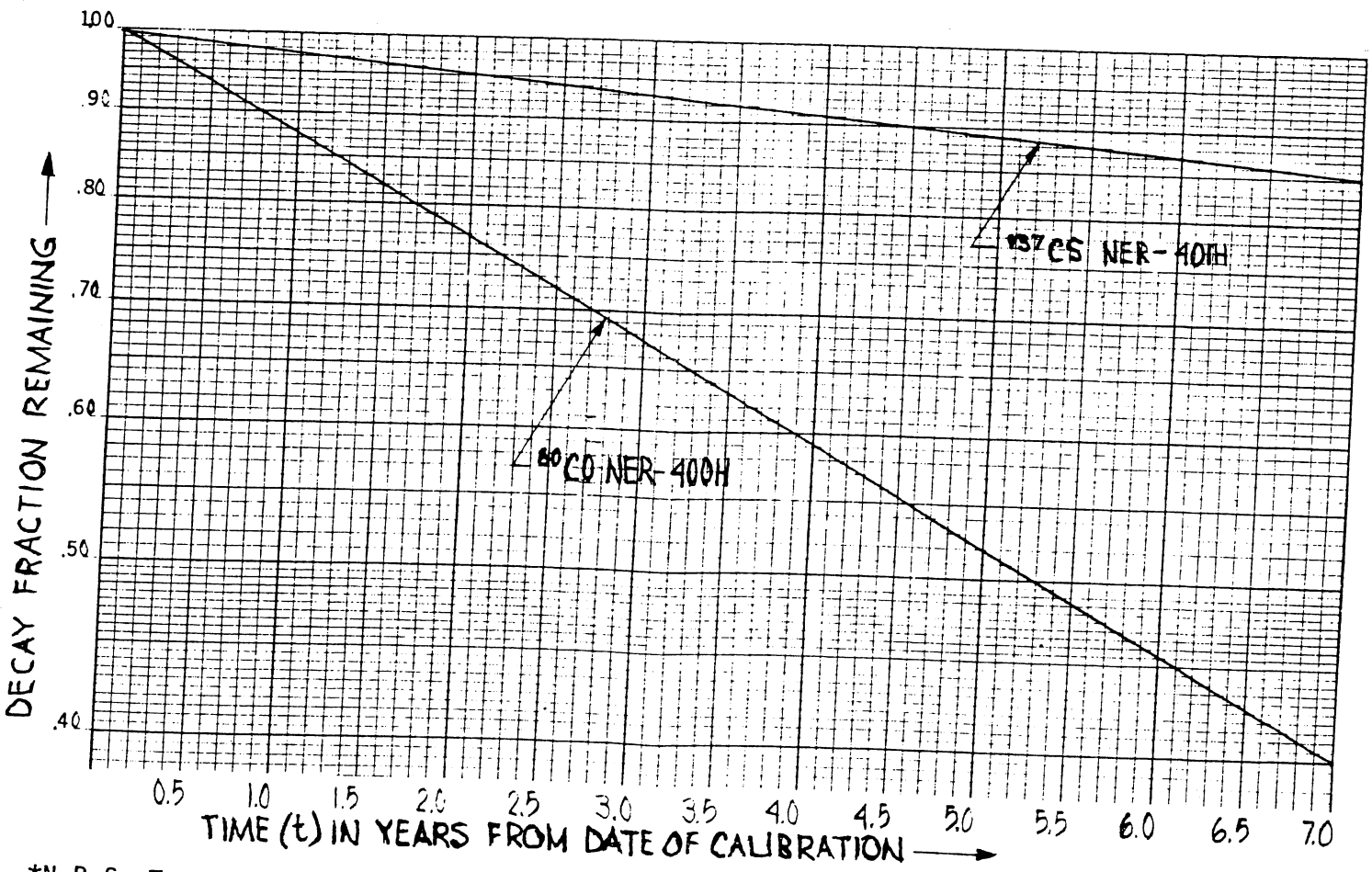
I = activity being determined for a given date.

I_0 = activity at the date of calibration.

t = elapsed time from date of calibration.

$t_{1/2}$ = 5.25 years for ^{60}Co and 30.0 years for ^{137}Cs.

The graph below describes the fraction remaining after a given time from the date of calibration.



*N.B.S. Traceable

NEN Products
549 Albany St.
Boston, MA 02118
Telephone 800-225-1572
Mass. & International 617-482-9595

TECHNICAL DATA

CERTIFICATE OF CALIBRATION
SEALED SOURCE GAMMA RADIATION DOSE RATE
FOR

XX MODEL NER-400H COBALT-60 SOURCE/SHIELD ASSEMBLY
____ MODEL NER-401H CESIUM-137 SOURCE/SHIELD ASSEMBLY

Issued To: Acct. Prop Officer-Whse #20
U.S.Army Natick RD&E Center
Kansas Street
Natick, MA 01760-5000

Serial No.: C0356
NEN Order No.: 15241330
Calibration Date: Dec. 13 1990

The Gamma Ray Air Absorbtion Dose Rate resulting from radiation emission of the subject source was determined to be 10.57 milliroentgens per hour at an exposure point 1.0 meter (39.4") distant, approximately perpendicular to the capsule longitudinal axis center line.

The measurement was performed using a Precision Ionization Chamber/ Electrometer System for which the dose equivalent response of the subject source was developed by comparison with XX N.B.S. Cobalt-60 Dose Rate SourceStandard #47342 ____ N.B.S. Cesium-137 Dose Rate Source Standard #47455. The overall uncertainty of the measurement value is estimated to be ± 4%.

The Dose Rate Value listed will diminish as a function of the radionuclide decay, by the expression $I = I_0 e^{-.693T/T\,1/2}$. For purposes of the calculations, half-life values of 5.26 years for ^{60}Cobalt and 30.1 years for 137 Cesium, are recommended.

Du Pont NEN Products hereby certifies that the subject Radiation Source has been calibrated as represented by this report; that the contributing data has been checked and verified, and that the N.B.S. Standards traceability has been authenticated.

For: Du Pont NEN Products
Nuclides and Sources Division

By: K Henrich 12/17/90
Nuclides and Sources Quality Assurance

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Co - 60

2.2 Activity: (a) _____ Curies (b) 8.0 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: 12 / 13 / 90 (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: E.I. Dupont

NEN Products

3.2 Model Number: NER-580

3.3 Serial Number: C0356

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: NA

4.2 Model Number: _____

4.3 Serial Number: _____

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☒ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☐ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) [X] Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) [ ] Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) [ ] Not Needed (c) [ ] Other (Describe) _____

(b) [ ] Damaged _____

LICENSE #: 20-00315-02

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) ☐ Continue storage for future use (b) ☐ Transfer to other licensee (c) ☐ Send for disposal (d) ☐ Transfer to Manufacturer (e) ☐ Problems with disposal. (Explain in number 8.0) (f) ☐ Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) ☒ NO - Go to 6.0 (b) ☐ YES - How many? (c) _____ (Continue)
2.0 2.1	INFORMATION ABOUT THE SOURCE Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0 3.1	SOURCE DESCRIPTION Manufacturer: _____	4.0 4.1	DEVICE DESCRIPTION Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

CERTIFICATE OF RADIOACTIVITY CALIBRATION

CERTIFICATE OF RADIOACTIVITY

Cobalt-60 Source

Lot Number: 171
Half-Life: 5.25 years

The activity of Cobalt-60 was found to be,

4.3 MILLICURIES on January 11, 1971

DESCRIPTION OF THE STANDARD

The activity has been doubly encapsulated by welding into stainless steel capsules and finally mounted in an aluminum and steel handling capsule.

METHOD OF CALIBRATION

The source was calibrated on a 4 π gamma ionization chamber against a source certified by the National Bureau of Standards.

ERRORS

Random Errors (the standard error)

a. Precision of the NENC measurement ± 1.0%

Systematic Errors

a. Precision of the calibration of the NENC ion chamber ± 1.5%
b. Precision of the NENC to NBS comparison ± 2.0%

Overall Errors

1.0 + 1.5 + 2.0 = ± 4.5%

New England Nuclear
575 Albany Street, Boston, Mass. 02118
CUSTOMER SERVICE: (617) 482-9595

RADIOACTIVE MATERIALS MOVEMENT

☐ SHIPMENT ☑ RECEIPT

(AR 55-55)

SECTION I - DETAILS OF SHIPMENT

TO: U.S. Army Natick Lab. Kansas St. Natick, Mass. 01760	FROM: New England Nuclear 575 Albany St. Boston, Mass. 02118	VIA: (Mode of shipment, i.e. Railway Express) TRUCK
SHIPMENT NO. PO# DAAG17-71-M-1242 19-716B NENC 218327	SIZE 10"x9"x8" 17"x5½x5½"	WEIGHT 20 lbs
CLASSIFICATION III	TYPE OF CONTAINER Cardboard	PRINCIPAL RADIOACTIVE MATERIAL Co^{60}
ACTIVITY Certificate 4.3 Mc (0.0443 curies) LABEL on BOX	(DATE OF (Fill in as applicable) / SHIPMENT (Estimate)	RECEIPT 12 Jan. 1971
LOCATION Radiation Lab.	COLLECT	PREPAID

1. DOES/DID THIS SHIPMENT REQUIRE ICC SPECIFICATION PACKAGING AND LABELING? ☑ YES ☐ NO
   ICC NO. _____ BUREAU OF EXPLOSIVES NO. _____
2. IS/WAS THIS A COURIER SHIPMENT? ☐ YES ☑ NO
3. IS/WAS IT PACKAGED TO PREVENT LEAKAGE UNDER TRANSPORTATION CONDITIONS? ☑ YES ☐ NO
4. IS/WAS THE SHIPMENT PROPERLY SECURED? ☑ YES ☐ NO
5. IS/WAS THE SHIPMENT PALLETIZED? ☐ YES ☑ NO

SIGNATURE OF CONSIGNOR/CONSIGNEE (As applicable)	DATE 12 Jan. 1971

SECTION II - HEALTH PHYSICS MONITORING RESULTS

MAXIMUM RADIATION LEVEL	AT SURFACE 40.0 mr/hr	AT 1 METER 0.9 mr/hr	AT 15 FEET 0.0 mr/hr
TYPE OF INSTRUMENT USED Victoreen 444		INSTRUMENT SERIAL NO. 180	REMOVABLE SURFACE CONTAMINATION (d/m/100 cm2) 13.8
WIPE TEST MATERIAL USED Glass Fiber		INSTRUMENT USED TO CHECK WIPE Nuclear Chicago Model 1514	
INSTRUMENT SERIAL NO. QMRE 59024		LOG NO.	

REMARKS

DATE	TIME	RADIATION SURVEY APPROVED BY
12 Jan. 1971	4:00 pm	H. Morrison.

SECTION III - RADIOLOGICAL SAFETY OFFICER'S STATEMENT OF MONITORING RESULTS

LOG NO.	BUREAU OF EXPLOSIVES SPECIAL PERMIT NO.	SAFE TO SHIP ☐ YES ☐ NO	SHIPMENT SAFE (Check upon receipt of shipment) ☐ YES ☐ NO

REMARKS

SIGNATURE OF RADIOLOGICAL OFFICER	DATE

SECTION IV - TRANSPORTATION OFFICER'S STATEMENT OF SHIPMENT

The above named articles are properly described and are packed and marked and are in proper condition for transportation according to the regulations prescribed by the appropriate regulatory agencies.

SIGNATURE OF TRANSPORTATION OFFICER	DATE

A FORM 1 JUN 64 2791

New England Nuclear

575 Albany Street, Boston, Mass. 02118
Tel. (617) 426-7311 Telex: 094-6582

NENC ORDER NO. 218327 | RLS. NO

CUSTOMER 44550 01

SOLD TO

U.S. ARMY NATICK LABS.
FINANCE & ACCTG. OFFICER
KANSAS ST.
NATICK, MASS. 01760

PLEASE REFER TO OUR ORDER NUMBER OF [illegible] CONCERNING THIS ORDER.

* INDICATES SUBSIDIARY PROCESSING THIS ORDER IF APPLICABLE

WE HAVE ENTERED YOUR ORDER AS FOLLOWS:

PURCHASE ORDER NO.	REQUISITION	CONTRACT OR FUND NO.	ROUTE
DAAG1771M1242	19-715B		F.O.B. BOSTON PPD

SALESMAN	ORDER RECEIVED	TODAYS DATE	ORDER STATUS AND TERMS	SHIPPED	RADIATION AT SURFACE	INSPECTOR
20	1/06/71	1/06/71	NET 30 DAYS EXEMPT	1/11/71	<100	[illegible]

LINE NO.	CATALOG NO.	COMPOUND OR SERVICE	LOT NO.	NO. OF PACKAGES	PACKAGE SIZE	ESTIMATED SHIP DATE	UNIT PRICE	INVTY. TYPE
010	NES 400	COBALT-60 GAMMA REFERENCE SOURCE	171	1	5MC	011271	[illegible]	

MATERIAL WILL NOT BE ACCEPTED FOR RETURN WITHOUT OUR PRIOR PERMISSION.

Seller represents that with respect to the production of the articles and/or the services covered by this invoice, it has fully [illegible]

CERTIFICATE OF RADIOACTIVITY CALIBRATION

CERTIFICATE OF RADIOACTIVITY

Cobalt-60 Source

Lot Number: 171
Half-Life: 5.25 years

The activity of Cobalt-60 was found to be,

4.3 MILLICURIES on January 11, 1971

DESCRIPTION OF THE STANDARD

The activity has been doubly encapsulated by welding into stainless steel capsules and finally mounted in an aluminum and steel handling capsule.

METHOD OF CALIBRATION

The source was calibrated on a 4 π gamma ionization chamber against a source certified by the National Bureau of Standards.

ERRORS

Random Errors (the standard error)

a. Precision of the NENC measurement ± 1.0%

Systematic Errors

a. Precision of the calibration of the NENC ion chamber ± 1.5%
b. Precision of the NENC to NBS comparison ± 2.0%

Overall Errors

1.0 + 1.5 + 2.0 = ± 4.5%

New England Nuclear
575 Albany Street, Boston, Mass. 02118
CUSTOMER SERVICE: (617) 482-9595

RADIOACTIVE MATERIALS MOVEMENT

☐ SHIPMENT ☑ RECEIPT

(AR 55-55)

SECTION I - DETAILS OF SHIPMENT

TO: U.S. Army Natick Lab. Kansas St. Natick, Mass. 01760	FROM: New England Nuclear 575 Albany St. Boston, Mass. 02118	VIA: (Mode of shipment, i.e. Railway Express) TRUCK
SHIPMENT NO. PO# DAAG1771M1242 19-715B NENC 218327	SIZE 10"x9"x8" 17"x5½x5½"	WEIGHT 20 lbs
CLASSIFICATION III	TYPE OF CONTAINER Cardboard	PRINCIPAL RADIOACTIVE MATERIAL Co^{60}
ACTIVITY Certificate 4.3 M.C LABEL of Box (0.0443 curies)	(DATE OF (Fill in as applicable) SHIPMENT (Estimate)	RECEIPT 12 Jan. 1971
LOCATION Radiation Lab.	COLLECT	PREPAID

1. DOES/DID THIS SHIPMENT REQUIRE ICC SPECIFICATION PACKAGING AND LABELING? ☑ YES ☐ NO
   ICC NO. _____ BUREAU OF EXPLOSIVES NO. _____
2. IS/WAS THIS A COURIER SHIPMENT? ☐ YES ☑ NO
3. IS/WAS IT PACKAGED TO PREVENT LEAKAGE UNDER TRANSPORTATION CONDITIONS? ☑ YES ☐ NO
4. IS/WAS THE SHIPMENT PROPERLY SECURED? ☑ YES ☐ NO
5. IS/WAS THE SHIPMENT PALLETIZED? ☐ YES ☑ NO

SIGNATURE OF CONSIGNOR/CONSIGNEE (As applicable)	DATE 12 Jan. 1971

SECTION II - HEALTH PHYSICS MONITORING RESULTS

MAXIMUM RADIATION LEVEL	AT SURFACE 40.0 mr/Hr	AT 1 METER 0.9 mr/Hr	AT 15 FEET 0.0 mr/Hr
TYPE OF INSTRUMENT USED Victoreen 444		INSTRUMENT SERIAL NO. 180	REMOVABLE SURFACE CONTAMINATION (d/m/100 cm2) 13.8
WIPE TEST MATERIAL USED Glass Fiber		INSTRUMENT USED TO CHECK WIPE Nuclear Chicago Model 151A	
INSTRUMENT SERIAL NO. QMRE 59024		LOG NO.	

REMARKS

DATE 12 Jan. 1971	TIME 4:00 pm	RADIATION SURVEY APPROVED BY H. Morrison.

SECTION III - RADIOLOGICAL SAFETY OFFICER'S STATEMENT OF MONITORING RESULTS

LOG NO.	BUREAU OF EXPLOSIVES SPECIAL PERMIT NO.	SAFE TO SHIP ☐ YES ☐ NO	SHIPMENT SAFE (Check upon receipt of shipment) ☐ YES ☐ NO

REMARKS

SIGNATURE OF RADIOLOGICAL OFFICER	DATE

SECTION IV - TRANSPORTATION OFFICER'S STATEMENT OF SHIPMENT

The above named articles are properly described and are packed and marked and are in proper condition for transportation according to the regulations prescribed by the appropriate regulatory agencies.

SIGNATURE OF TRANSPORTATION OFFICER	DATE

DA FORM 1 JUN 64 2791

New England Nuclear
575 Albany Street, Boston, Mass. 02118
Tel. (617) 426-7311 Telex: 094-6582

NENC ORDER NO.	RLS. NO.
218327	

CUSTOMER
44550 01

SOLD TO
U.S. ARMY NATICK LABS.
FINANCE & ACCTG. OFFICER
KANSAS ST.
NATICK, MASS. 01760

PLEASE REFER TO OUR ORDER NUMBER ON INQUIRIES CONCERNING THIS ORDER.

* INDICATES SUBSIDIARY PROCESSING THIS ORDER IF APPLICABLE

WE HAVE ENTERED YOUR ORDER AS FOLLOWS:

PURCHASE ORDER NO.	REQUISITION	CONTRACT OR FUND NO.	ROUTE
DAAG1771M1242	19-715B		F.O.B. BOSTON PPD AM COURTER

SALESMAN	ORDER RECEIVED	TODAYS DATE	ORDER STATUS AND TERMS	SHIPPED	RADIATION AT SURFACE	INSPECTOR
[illegible]	[illegible]	1/06/71	NET 30 DAYS EXEMPT	1/11/71	<100	[illegible]

LINE NO.	CATALOG NO.	COMPOUND OR SERVICE	LOT NO.	NO. OF PACKAGES	PACKAGE SIZE	ESTIMATED SHIP DATE	UNIT PRICE	INVTY. TYPE
[illegible]	NES 400	COBALT-60 GAMMA REFERENCE SOURCE	121	1	5MC	011271	165.00	

MATERIAL WILL NOT BE ACCEPTED FOR RETURN WITHOUT OUR PRIOR PERMISSION.
[illegible] and/or the services covered by this invoice, it has fully complied with the provisions of the Fair Labor Standards Act of 1938, as amended

PACKING LIST

AMSSC-S-ENS 29 August 1996

MEMORANDUM FOR RECORD

SUBJECT: Receipt of Americium-241

1. I hear by take possession of one Americium-241 source (serial number HP 1000). This source was transferred in good condition from the U.S. Army Research Laboratory Watertown Site to Mr. John F. Sieckarski. I have provided Mr. Peter Cornetta, Radiation Safety Officer with a copy of the U.S. Army Soldier Systems Commands U.S. Nuclear Regulatory Commission License, Byproduct Material License #20-00315-02.

PAUL G. ANGELIS
Radiation Protection Officer

CF:
Mr. Peter Cornetta, U.S. Army Research Laboratory Watertown Site
Mr. John F. Sieckarski, Alternate RPO

CERTIFICATE OF RADIOACTIVITY CALIBRATION

Americium-241 Reference Source
NES-302S

Half-Life: 432.2 ± 0.5 years
Lot Number: 302S070684-00

The Americium-241 activity was determined to be 4.0×10^{4} alpha particles per minute expressed as the 2π alpha emission or 36 nanocuries expressed as the total activity content on July 6, 1984.

DESCRIPTION OF THE STANDARD

The activity is electrodeposited on a platinum disc to form a 10 mm diameter active area. The source is mounted in an aluminum mount having a 25 mm overall diameter and a 3.2 mm height.

METHOD OF CALIBRATION

The source was calibrated by measurement in a 2π proportional counter against a secondary standard. The secondary standard was calibrated by direct comparison to the National Bureau of Standard Americium-241 alpha disc SRM 4904-M-F-46.

New England Nuclear Corporation participates in a National Bureau of Standards-Atomic Industrial Forum measurement assurance program in order to insure the continuing traceability of NEN's radioassays to the NBS.

RADIOIMPURITIES

The source was examined for photon-emitting impurities with a Ge(Li) spectrometer system. The radioimpurities were determined to be <1% expressed as a percentage of the gamma-ray-emission rate of the 59.5 keV gamma ray of Americium-241.

ERRORS

Random Errors (99% confidence level)

Precision of the measurement of the source	± 0.8 %
Precision of the measurement of the NEN secondary standard	± 0.2 %

Systematic Errors

Accuracy of the NEN secondary standard	± 4.0 %

Overall Error

$$[(0.8)^2 + (0.2)^2]^{1/2} + \quad = \quad \pm 4.8\ \%$$

CUSTOMER TECHNICAL SERVICE

FOR TECHNICAL ASSISTANCE

CALL

(617) 482-9595

Ext. 2283, 2284

AMSSC-S-ENS

29 August 1996

MEMORANDUM FOR RECORD

SUBJECT: Receipt of Americium-241

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PAUL G. ANGELIS
Radiation Protection Officer

CF:
Mr. Peter Cornetta, U.S. Army Research Laboratory Watertown Site
Mr. John F. Sieckarski, Alternate RPO

MATERIALS LICENSE

Amendment No. 30

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Department of the Army U.S. Army Soldier Systems Command	In accordance with the letter dated June 4, 1996, 3. License Number 20-00315-02 is amended in its entirety to read as follows:
2. Natick, Massachusetts 01760-5000	4. Expiration Date November 30, 2000
	5. Docket or Reference No. 030-04578

6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum Amount that Licensee May Possess at Any One Time Under This License
A. Hydrogen 3	A. Any	A. 500 millicuries
B. Carbon 14	B. Any	B. 250 millicuries
C. Phosphorus 32	C. Any	C. 20 millicuries
D. Phosphorus 33	D. Any	D. 10 millicuries
E. Sulfur 35	E. Any	E. 10 millicuries
F. Calcium 45	F. Any	F. 20 millicuries
G. Chromium 51	G. Any	G. 10 millicuries
H. Iodine 125	H. Any	H. 10 millicuries
I. Cobalt 60	I. Sealed source	I. 10 millicuries
J. Cesium 137	J. Sealed source	J. 1 millicurie
K. Nickel 63	K. Plated sources or foils	K. 45 millicuries
L. Nickel 63	L. Plated sources or foils	L. 20 millicuries

9. Authorized use

A. through J. Research and development as defined in 10 CFR 30.4; animal studies.
K. In electron capture detector cells which are distributed under a specific license issued by the U.S. Nuclear Regulatory Commission or any Agreement State.
L. For storage only in electron capture detector cells which are distributed under a specific license issued by the U.S. Nuclear Regulatory Commission or any Agreement State.

CONDITIONS

10. Licensed material may be used at the licensee's facilities at the U.S. Army Soldier Systems Command, Natick, Massachusetts and at temporary job sites of the licensee anywhere in the United States.

11. A. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation Safety Committee.

B. The Radiation Safety Officer for this license is Paul G. Angelis.

License Number 20-00315-02

Docket or Reference Number 030-04578

Amendment No. 30

MATERIALS LICENSE
SUPPLEMENTARY SHEET

12. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed 3 years.

B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.

C. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.

D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.

E. Sealed sources and detector cells need not be leak tested if:

(i) they contain only hydrogen 3; or

(ii) they contain only a gas; or

(iii) the half-life of the isotope is 30 days or less; or

(iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or

(v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transfer to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source involved, the test results, and corrective action taken.

G. The licensee is authorized to collect leak test samples for analysis by the licensee. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.

License Number
20-00315-02

Docket or Reference Number
030-04578

Amendment No. 30

MATERIALS LICENSE
SUPPLEMENTARY SHEET

13. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.

14. Experimental animals administered licensed materials or their products shall not be used for human consumption.

15. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 5 years from the date of each inventory.

16. The licensee may transport licensed material in accordance with the provisions of 10 CFR 71, "Packaging and Transportation of Radioactive Material."

17. The licensee is authorized to hold radioactive material with a physical half-life of less than 120 days for decay-in-storage before disposal in ordinary trash, provided:

    A. Waste to be disposed of in this manner shall be held for decay a minimum of ten half-lives.

    B. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.

    C. A record of each such disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.

License Number
20-00315-02

Docket or Reference Number
030-04578

Amendment No. 30

MATERIALS LICENSE
SUPPLEMENTARY SHEET

18. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Application dated August 8, 1989
B. Letter dated March 20, 1990
C. Letter dated August 17, 1990
D. Letter dated October 2, 1990
E. Letter dated January 21, 1993
F. Letter dated June 4, 1996

For the U.S. Nuclear Regulatory Commission

Date JUL - 5 1996

By Keith D. Brown

Division of Nuclear Materials Safety
Region I
King of Prussia, Pennsylvania 19406

FACSIMILE TRANSMITTAL HEADER SHEET

For use of this form see AR 25-11, the proponent agency is ODISC4

COMMAND/ OFFICE	NAME/ OFFICE SYMBOL	OFFICE TELEPHONE NO. (AUTOVON/Comm.)	FAX NO. (AUTOVON/Comm.)
FROM: PAUL G. ANGELIS SSCOM	AMSSC-S-ENS	DSN 256-5208 508 651-5208	DSN 256-5393 508 651-5393
TO: Peter Cornetta	USAMTL	DSN 955-3816 617-753-3816	DSN 955-3813 617 ~~753~~-3813

CLASSIFICATION	PRECEDENCE	NO PAGES (Including this Header)	DATE-TIME	MONTH	YEAR	RELEASER'S SIGNATURE
Unclassified	Routine	6	29 1500	Aug	1996	

REMARKS

Space Below For Communications Center Use Only

DA FORM 3918-R, JUL 90 DA FORM 3918-R AUG 72 IS OBSOLETE

ARMY RESEARCH LABORATORY

TECHNOLOGY TO WIN

OPERATIONS DIRECTORATE

WATERTOWN SITE

FACSIMILE TRANSMITTAL HEADER SHEET

For use of this form see AR 25-11 the proponent agency is CDISC4

COMMAND/ OFFICE	NAME/ OFFICE SYMBOL	OFFICE TELEPHONE NO (AUTOVON/Comm)	FAX NO (AUTOVON/Comm)
FROM: U.S. Army Research Laboratory Caretaker Force	Peter Cornetta AMSRL-OP-WT-RK	(617) 753-3816	(617) 753-3813
TO: U.S. Army Natick Research, Development & Engineering Center	Paul Angelus	(508) 233-5208	(508) 233-5393

CLASSIFICATION	PRECEDENCE	NO PAGES (including this header)	DATE TIME	MONTH	YEAR	RELEASER'S SIGNATURE
U	NONE	2	8-29-96 0920	8	96	Peter Cornetta

REMARKS

Space Below For Communications Center Use Only

DA FORM 3918-R, JUL 90 (DA FORM 3918-R, MAR 72 IS OBSOLETE)

28 August 1996

MEMORANDUM FROM: U.S. Army Natick Research Development & Engineering Center, ATTN: SAT NC-ZSR (Paul Angelus), Natick, MA 01760-5033

SUBJECT: Receipt Of Americium-241

1. I hereby take possession of one Americium-241 source (Serial Number HP 1000) This source was transferred in good condition by Mr. Peter Cornetta (U.S. Army Research Laboratory Watertown, Massachusetts) to Mr. John Siekarski. I have have provided Mr. Cornetta with a copy of the Byproduct material license possessed by this Command as stated in 10CFR30.41 and 31.8.

Paul Angelus
Radiation Safety Officer

The electronics adjust the pulse frequency to maintain a constant current from the cell; thus, the sample molecules and the electronics compete for the available electron population. The result is a pulse frequency that varies directly with the concentration of sample molecules in the cell.

The radioactive source used in the ECD is Ni_{63}. This is plated onto the inner surface of the cell body. It is a solid at the temperatures used in chromatography. Some of the properties are listed here.

Half Life:	101.1 years
Emission:	65.87 KeV max, beta radiation
Melting Point:	1453°C
Total Activity:	15 millicuries Ni_{63} maximum

WARNING

Although beta particles at this energy level have little penetrating power (the surface layer of skin or a few sheets of paper will stop most of them), they may be hazardous if the isotope is ingested or inhaled. For this reason the cell must be handled with care, radioactivity leak tests must be performed at regular intervals, the inlet and outlet fittings must be capped when not in use, corrosive chemicals must not be introduced into the detector, and the effluent from the detector must be vented outside the laboratory environment. Details concerning these precautions are given later in this book.

Selecting an Instrument Location

The instrument in which the ECD is mounted must be placed where the detector effluent can be vented. It must not be released into the laboratory environment. A vent line to a fume hood is a convenient way to accomplish this.

This precaution is taken to avoid radioactive contamination of the laboratory if an abnormal condition should occur.

Using the Detector

Type of Sample

The ECD is used for low-level detection of electron-capturing substances. These include mono- and polyhalogenated compounds, nitro derivatives, and anhydrides. The detector produces little or no response to hydrocarbons, ethers, and esters, or to aliphatic alcohols, ketones, and amines. Hydrocarbons, ethers, and esters, in that order, are the preferred solvents for ECD analysis.

Because of the combination of very high sensitivity and selectivity provided by the ECD, it is widely used for trace level analysis of halogenated, particularly chlorinated, components. A major application is the detection and quantitation of pesticide residues, many of which are chlorinated.

WARNING

Materials which may react with the Ni_{63} source, either to form volatile products or to cause physical degradation of the plated film, must be avoided. These include oxidizing compounds, acids, wet halogens, wet nitric oxide, ammonium hydroxide, hydrogen sulfide, and carbon monoxide. This list is not exhaustive but indicates the kinds of compounds that may cause damage to Ni_{63} detectors.

Temperature Limitations for HP 19282/HP 19312

The detector cell must not be heated above 350°C. This can be prevented by use of the temperature LIMIT key on the HP 5880. In both instruments (HP 5790 and HP 5880), if the temperature should rise above 350°C, whether due to an incorrect set point entry or to an instrument malfunction, a safety circuit will turn the heater power off at 370 ± 10°C.

WARNING

If the safety circuit should deactivate the detector heater, a hardware problem may exist in the instrument. Verify that the temperature set point is at or below 350°C. If it is, consult the instrument manual for information on diagnosing and correcting the problem.

HP 5790 Reference Manual, Sections 4 and 6
HP 5880 Operating Manual, Volume 4

Heater power cannot be restored except by turning the entire instrument off and back on again.

Maintenance

Customer maintenance of the ECD is limited to installation, radioactivity leak testing, removal of the detector, and thermal cleaning.

We recommend that the detector be returned to the factory at least once every two years for thorough inspection and servicing. Very severe usage (high-temperature operation, sample residue buildup, etc) may require more frequent servicing.

Installation

Electron Capture Detectors (ECD) ordered as an option to an HP 5790A, HP 5880A, or HP 5890A Gas Chromatograph are installed at the factory.

If the ECD is purchased as an add-on accessory, detailed instructions for installation are shipped with it.

WARNING

To prevent possible creation of a hazardous situation, the instructions must be followed exactly. In particular, those sections concerning the overheat protection board and the thermal measurement board must be followed exactly.

All labels must be installed as instructed.

The instructions include a procedure for verifying correct operation of the overheat protection circuitry. If this circuitry does not function correctly, turn the instrument off and notify Hewlett-Packard immediately. Do not attempt to use the instrument.

Removing the Detector

You will need to remove the detector if you wish to reposition it on the oven or if it is to be returned to Hewlett-Packard.

Begin by turning the heated zone power off and allowing the detector to cool to room temperature. When the detector has cooled, turn all gas flows off, remove the column to which the detector is connected, and turn the main instrument power off. Remove the power cord from the wall receptacle.

After completing these steps, use one of the following procedures. You will need a no. 2 Pozidriv screwdriver (a Phillips screwdriver can also be used) and, for the HP 5880A, a pair of needle-nosed pliers. Use disposable rubber or plastic gloves, or wash your hands thoroughly after handling the detector.

Procedure for HP 19282 ECD (HP 5790A Gas Chromatograph)

The HP 19282 ECD is removed as a complete assembly consisting of the detector, detector cover, attached electronic components, and detector mounting plate. Do not attempt to disassemble the detector or remove the cover.

1. If an automatic sampler is installed, remove all sample vials from the tray (HP 7671) or remove the sample cassette (HP 7672).

   Turn off and disconnect the air line from the back of the sampler.

   Disconnect the cables coming from the back of the sampler.

   The mounting plate for the sampler is attached by three screws along the back edge and one screw in the front left corner. Remove all four screws.

   Get help; the sampler/mounting plate assembly is heavy and awkward to handle. Remove the sampler and mounting plate as a unit and set it to one side.

2. Disconnect the tubing attached to the detector vent. This is the tube that extends to the right from the detector body (top-mounted ECD) or that exists from the front of the instrument just to the right of the oven (side-mounted ECD, HP 5793A and HP 5794A only).

Leaks

NOTE

This test assumes flow system components upstream from the detector (inlet, column) are leak-free.

1. Set inlet, oven, and detector temperatures to ambient and allow time for cooling. Turn off the detector, and turn off its carrier flow.

2. Use a vent plug (Part No. 5060-9055) to cap the ECD exhaust vent.

3. Set carrier gas pressure at the inlet to the instrument to 276 kPa (40 psi). Open the carrier gas mass flow controller fully to insure flow through the system is available. Allow time for the system to become fully pressurized.

4. Close carrier gas flow at its source and monitor system pressure.

5. The system may be assumed to be leak-free if no pressure drop is observed over a 5-minute period.

6. If leakage is observed, use an appropriate leak-detecting fluid to check for leaks at detector column fittings, and at the plugged vent.

7. The detector body itself is NOT a likely source of leaks: in any case, it cannot be disassembled without special license from the Nuclear Regulatory Commission (U.S.A. only).

Cleaning

WARNING

DETECTOR DISASSEMBLY, AND/OR CLEANING PROCEDURES OTHER THAN THERMAL SHOULD BE PERFORMED ONLY BY PERSONNEL TRAINED AND LICENSED APPROPRIATELY TO HANDLE RADIOACTIVE MATERIALS. TRACE AMOUNTS OF RADIOACTIVE ^{63}Ni MAY BE REMOVED DURING OTHER PROCEDURES, CAUSING POSSIBLE HAZARDOUS EXPOSURE TO β- AND X-RADIATION (BREMSSTRAHLUNG).

Cleaning by "bake-out" of the detector is performed only after verification that carrier supply gas and flow system components, are leak- and contaminant-free.

WARNING

TO PREVENT POSSIBLE HAZARDOUS CONTAMINATION OF THE AREA WITH RADIOACTIVE MATERIAL, THE DETECTOR EXHAUST VENT ALWAYS MUST BE CONNECTED TO A FUME HOOD, OR OTHERWISE VENTED IN COMPLIANCE WITH THE LATEST REVISION OF TITLE 10, CFR, PART 20, OR WITH STATE REGULATIONS WITH WHICH THE NUCLEAR REGULATORY COMMISSION HAS ENTERED INTO AN AGREEMENT (U.S.A. ONLY). FOR OTHER COUNTRIES, CONSULT WITH THE APPROPRIATE AGENCY FOR EQUIVALENT REQUIREMENTS.

1. Remove the column from the detector; install in its place an empty glass column.
2. Establish normal carrier gas flow rate (20 to 30 mL/min); set oven temperature to 250 °C.
3. Heat the detector to 350 °C; allow thermal cleaning to continue for several hours.

Radioactivity Leak Test ("Wipe Test")

ECDs must be tested for radioactive leakage at least every six months. Records of tests and results must be maintained for possible inspection by the Nuclear Regulatory Commission and/or responsible state agency. More frequent tests may be conducted: under severe usage conditions, radioactivity leak tests at every column change provides maximum security.

The procedure used is the "wipe test". A wipe test kit (Part No. 18713-60050) is supplied with each new ECD. Its contents are listed in Table 12-2:

Item	Description	Part No.	Qty.
1	Information Card	18713-90040	12
2	Filter Paper	3152-0035	12
3	Plastic Bag	9222-0308	12
4	Envelope	05750-80036	4
5	*Service Note 5700A-5*	5950-3586	1

Table 12-2 5890A Radioactivity Leak Test ("Wipe Test") Kit

WARNING

DISPOSABLE PLASTIC OR RUBBER GLOVES SHOULD BE WORN WHEN PERFORMING THIS TEST. IF NOT USED, WASH YOUR HANDS THOROUGHLY WHEN FINISHED.

The "*Service Note*" included in the kit gives detailed instructions for performing the wipe test on Hewlett-Packard ECDs. The following information is modified to apply specifically to the 5890A ECD.

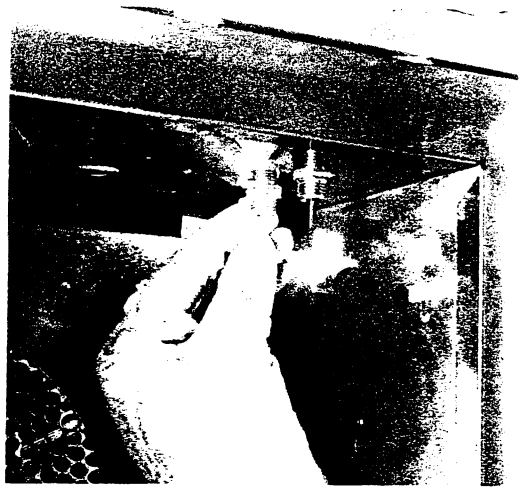
1. Complete three information cards (Item 1).

2. Using a pencil, label three pieces of filter paper (Item 2) as follows:

   Sample 1- **Det. Entrance Fitting**
   Sample 2- **Det. Housing**
   Sample 3- **Det. Exit**

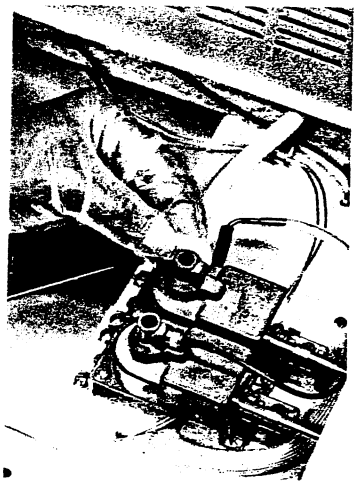
3. Remove the column from the ECD.

"DETECTOR ENTRANCE FITTING":

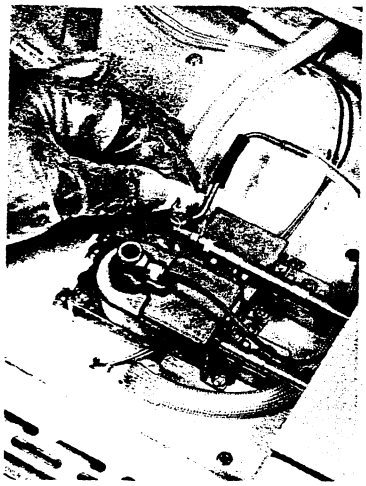


1420-09

"DETECTOR HOUSING":



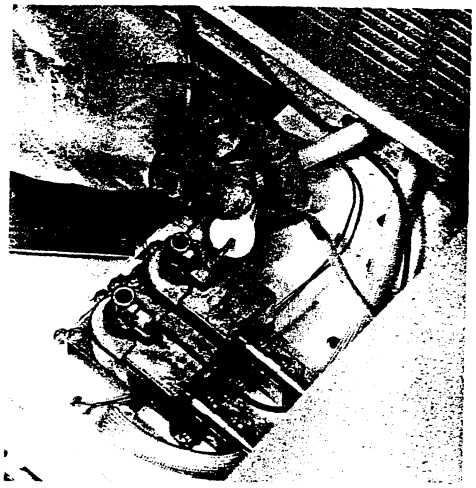
1421-09



1421-07

1421-08

"DETECTOR EXIT":



1421-03

1421-05

Figure 12-23. Locations at which to Perform the ECD "Wipe Test"

To: Paul Angelis@SpecStaff
From: Rosa Linda Bagalawis@surd
Cc:
Bcc:
Subject: Electron capture detector
Attachment:
Date: 11/22/96 10:55 AM

Paul,

The GC with electron capture detector that used to be in R229 is now in S-123.

Rosa Linda

HEWLETT PACKARD

HEWLETT-PACKARD COMPANY

BYPRODUCT MATERIALS (RADIOACTIVE) LICENSE VERIFICATION

For new purchase and return for exchange of specific license radioactive electron capture detectors HP 18713A, HP G1224A, HP part number 18803-60520, HP 19235, and HP 19303. Also for return for exchange of general license detectors HP 19282, HP 19233, HP G1223A, and HP 19312, for purchase of conversion kits HP 18742E, HP 19393, and HP 19235D, for use within the U.S. only.

For new purchase of general license detectors HP 19282, HP 19233, HP 19312, or G1223A customer certification card in HP publication number 43-5953-1798 or part number 5953-1798 must be completed. Hewlett-Packard distributes under NRC license numbers 37-07002-03G (General) and 37-07002-02 (Specific).

INSTRUCTIONS:

1. Complete section A below. Read section B and complete the appropriate certification statement (specific license below, general license on reverse side).
2. For new purchase, mail this form to your local Hewlett-Packard sales office.
3. For returns for exchange/servicing of used detectors, see section C reverse side.

A. CUSTOMER INFORMATION

COMPANY _____

ADDRESS _____

_____

_____

TELEPHONE NO. _____

CUSTOMER NAME _____

CUSTOMER P.O. NO. _____

HEWLETT-PACKARD SALES OFFICE _____

HEWLETT-PACKARD SALES ORDER NO. _____

TAX STATUS: TAXABLE ☐ EXEMPT ☐

B. LICENSE VERIFICATION

Failure to comply with licensing requirements can cause serious consequences for both your company and Hewlett-Packard. Having a designated licensee read and complete the applicable certification statement (specific license below, general license on reverse side) will serve as a check that you are properly licensed to receive the material indicated.

SPECIFIC LICENSE CERTIFICATION

The Nuclear Regulatory Commission Regulators require Hewlett-Packard to have on file verification of your NRC license (or State license if you live in an "Agreement" state) before shipping your detector. This license must be current and it must apply to the type, quantity, and form being purchased on the above-referenced order. (See CRF Title 10, and NRC form 313 and Regulatory Guide 10.7 for licensing information).

This is to certify that our NRC or Agreement State License is current and permits us to receive the type, quantity, and form of radioactive materials for the use specified as described below.

QTY		NEW PURCHASE	EXCHANGE	DETECTOR SERIAL NO.
_____	HP 19235 EC Detector, 15 mCi Ni 63-plated part, for use on HP 5890A Series Gas Chromatographs.	☐	☐	_____
_____	HP 18713A EC Detector, 15 mCi Ni 63-plated part, for use on HP 5700 and HP 5790 Series Gas Chromatographs.	☐	☐	_____
_____	Hewlett-Packard EC Detector, part number 18803-60520, 15 mCi Ni 63-plated part, for use on HP 5830/5840 Series Gas Chromatographs.	☐	☐	_____
_____	HP 19303 EC Detector, 15 mCi Ni 63-plated part, for use on HP 5880 Series Gas Chromatograph.	☐	☐	_____
_____	HP 18742E Accessory, for converting general license ECD (HP 19282) to specific license (HP 18713A).	☐		_____
_____	HP 19393 Accessory, for converting general license ECD (HP 19312) to specific license (HP 19303).	☐		_____
_____	HP 19235D Accessory, for converting general license (HP 19233) to specific license (HP 19235).	☐		_____
_____	HP ECD Detector no. G1224A, 15 mCi for use on HP 5890 Series Gas Chromatographs	☐		_____

LICENSE NUMBER _____

ISSUING AGENCY _____

EXPIRATION DATE _____

SIGNATURE OF AUTHORIZED OFFICER OR LICENSED USER

_____

DATE _____

DEPARTMENT OF THE NAVY
NAVY CLOTHING AND TEXTILE RESEARCH FACILITY
POST OFFICE BOX 59
NATICK, MASSACHUSETTS 01760-0001

AREA CODE 508-651 & EXT
AUTOVON 256 & EXT

EXT. 4742

IN REPLY REFER TO:

5090
20.8
1 Mar 93

From: Officer in Charge, Navy Clothing and Textile Research Facility
To: Commander, U.S. Army Natick Research, Development and Engineering Center, ATTN: Safety Officer, Natick, MA 01760

Subj: TRANSFER OF EQUIPMENT CONTAINING RADIOACTIVE SOURCE

Ref: (a) PHONCON NATICK Safety P. Angelis/NCTRF (Code 20) D. Peppenelli of 28 Jan 93

1. As discussed during reference (a), the Hewlett Packard Gas Chromatograph, Model #5890A, with Nickel 63 Electron Capture Detector (serial L4657 dated 12/88) located in Building 7, room 120 has been formally transferred to the property account of D. Robertson, SSD, NATICK (Research Building, R220).

for W. E. JOHNSON

Copy to:
20
NCTRF Safety Manager
D. Robertson, NRDEC

PART A

1.0 Do you currently have any sealed sources or devices containing radionuclides (see Table 1) with activity equal to or greater than one millicurie?

(a) ☐ NO - Go to PART B (Reverse side of this form)

(b) ☒ YES - Complete form PARTS A and B for each sealed source and/or device.

(c) For multiple sealed sources that have identical model numbers, indicate the total number of sources this form represents: 1

2.0 INFORMATION ABOUT THE SEALED SOURCE

2.1 Radionuclide: (a) Element/Mass Number Ni - 63

2.2 Activity: (a) _____ Curies (b) 15 Millicuries

(c) _____ Becquerels (d) _____ Grams

2.3 Date Activity Measured or Assayed: 12 / ___ / 88 (Month/Day/Year)

3.0 SOURCE DESCRIPTION

3.1 Manufacturer: Hewlett Packard

3.2 Model Number: Unknown

3.3 Serial Number: L4657

4.0 DEVICE DESCRIPTION

4.1 Manufacturer: Hewlett Packard

4.2 Model Number: 5890A

4.3 Serial Number: LR47359C

5.0 PRINCIPLE USE OF RADIOACTIVE MATERIAL (One principle use only)

(a) ☐ Calibration (b) ☐ Teletherapy (c) ☐ Well Logging

(d) ☒ Gas Chromatography (e) ☐ Portable Gauging (f) ☐ Irradiation

(g) ☐ Fixed Gauging (h) ☐ Radiography

(i) ☐ General Neutron Applications

(j) ☐ X-Ray Fluorescence (k) ☐ Self-Luminous Light source

(l) ☐ Other (Describe): _____

6.0 SOURCE/DEVICE STATUS (Enter total number in each status)

(a) [X] Actively Used (At least once in the past year) Go to PART B, reverse side of this form.

(b) [ ] Inactive (Continue)

6.1 Reasons for Inactivity: (Enter total number in each status)

(a) [ ] Not Needed (c) [ ] Other (Describe) _____

(b) [ ] Damaged _____

LICENSE #: 20-00315-02

NRC SSD Survey (OMB Approved 3150-0152) 1/91

7.0	PLANS FOR INACTIVE SOURCE (Enter total number in each status) (a) ☐ Continue storage for future use (b) ☐ Transfer to other licensee (c) ☐ Send for disposal (d) ☐ Transfer to Manufacturer (e) ☐ Problems with disposal. (Explain in number 8.0) (f) ☐ Other (Describe in number 8.0, comments below)
8.0	PART A COMMENTS/EXPLANATIONS: (Use additional sheets, if needed) (Continue to PART B)

PART B

1.0	Was a sealed source/device lost during 1990 with activity equal to or greater than one millicurie? (See Table 1.) A form is required for each unique source/device type. (a) ☒ NO - Go to 6.0 (b) ☐ YES - How many? (c) _____ (Continue)
2.0	INFORMATION ABOUT THE SOURCE
2.1	Radionuclide: (a) Element/Mass Number ____-____
2.2	Activity: (a) _____ Curies (b) _____ Millicuries (c) _____ Becquerels (d) _____ Grams
2.3	Date Activity Measured/Assayed: _____/____/_____ (Month/Day/Year)

3.0	SOURCE DESCRIPTION	4.0	DEVICE DESCRIPTION
3.1	Manufacturer: _____	4.1	Manufacturer: _____
3.2	Model Number: _____	4.2	Model Number: _____
3.3	Serial Number: _____	4.3	Serial Number: _____

5.0	PART B COMMENTS: (Use additional sheets, if needed)
6.0	PRINT YOUR NAME AND DATE BELOW AND RETURN THE ENTIRE PACKAGE IN THE PRE-ADDRESSED ENVELOPE. THANK-YOU FOR YOUR COOPERATION. (a) Form completed by: Paul G. Angelis - Radiation Protection Officer (b) Date: 5 September 1991

LICENSE #: 20-00315-02

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least three copies to the airline)

Shipper:
Cabrera Services for US Army JMC
809 Main Street, Suite 204
East Hartford, CT 06108

Air Waybill No. 792008788535

Page 1 of 1 Pages

Shipper's Reference Number USA 2004-024-1
(optional)

Consignee:
Duratek Consolidation and Services Fac
16043 Dunbarton Rd.
Barnwell, SC 29812

Attn: Reynoolds Black

FedEx®

Two completed and signed copies of this Declaration must be handed to the operator.

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for *(delete non-applicable)*

[redacted]	CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination
CAE

Shipment type: ***(delete non-applicable)***

[redacted]	RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification					Quantity and type of packaging	Packing Inst.	Authorization
Proper Shipping Name	Class Or Division	UN or ID No.	Pack-ing Group	Subsi-Diary Risk			
Radioactive Material, Type A Package, non-special form, non-fissile	7	UN-2915	N/A	None	Metal Drum. 3.62 MBq AM-231, H-3 Co-60, Cs-137 Ni-63, I-129 Ra-226 1 DOT 7A Type A Dim. 66cmx91cm	III Yellow TI-1.5	

Additional Handling Information:

Emergency Telephone Number: 800-424-9300

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations.

Name/Title of Signatory
Wade Fillingame/Sr. Broker
Place and Date
Natick MA, 5/26/04
Signature
(see warning above)

FOR RADIOACTIVE MATERIAL SHIPMENT ACCEPTABLE FOR PASSENGER AIRCRAFT, THE SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN OR INCIDENT TO RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

7Form RHA - CT
(5/80)

South Carolina Department of Health and Environmental Control
Radioactive Waste Shipment Certification Form

General Instructions and Information: This is a two part form to be used by shippers and carriers of radioactive waste. The certifications contained herein satisfy the requirements of Section 13-7-150, of Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act. This certification along with a copy of the prior notification form shall accompany each shipment of radioactive waste into and within the State of South Carolina. The shipper is to complete his portion of the form and present it to the carrier as part of the shipping documents. Upon receipt, the carrier shall complete his portion of the form. Upon delivery of the shipment to the consignee, a copy of this certification form, and a copy of the Prior Notification and Manifest form with the consignee acknowledgment, shall be returned to the Department.

Part I: Shipper's Certificate of Compliance

1. Name of Shipper and Address: US Army Natick Soldier Systems, Natick MA US Army Joint Munitions Command AMSOS-SF (Mike Styvaert) 1 Rock Island Arsenal Rock Island, IL 61299-6000 Phone: (309) 782-1886 **Attention:** Wade Fillingame **Telephone No.: 865-300-5789**	**2. Shipment Identification No.:** SCN-0062-04 **3. Transport Permit No.:** 0137-00-04-E

In compliance with Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, I hereby certify on behalf of the above named shipper to the South Carolina Department of Health and Environmental Control that the above named shipper has complied with all provisions of Act No. 499 of 1980, and all applicable laws and administrative rules and regulations, both State and Federal, regarding the packaging, transportation, storage, disposal and delivery of such wastes. I further certify that this shipment of radioactive waste has been inspected within 48 hours of the time of departure and that no items of non-compliance with applicable laws, rules or regulations were found.

Date: 5/27/04

Wade Fillingame, Sr. Certified Broker
Typed Name and Title of Agent or Shipper

Signature

Part II: Carrier's Certification

1. Name of Carrier and Address: FedEx	**2. Shipment Identification No.** SCN-0062-04 **3. Transport Trailer No.**
4. Scheduled Date of Departure of Shipment: 05/27/04	**5. Estimated Date of Arrival of Shipment:** 05/29/04

Certification is hereby made to the South Carolina Department of Health and Environmental Control that: (a) the shipper has provided the carrier with a copy of the shipment manifest, the certificate of compliance, and the routing instructions; (b) the shipment of radioactive waste has been properly placarded for transport according to applicable U.S. Department of Transportation Regulations; (c) all shipping papers originated or reproduced by the carrier have been properly executed; (d) the transport vehicle has been inspected according to applicable State and Federal regulations within the prescribed intervals and that all safety and operational components are in good working order and meet the requirements of regulations; (e) all drivers who will operate the vehicle within the state of South Carolina are qualified to transport hazardous material as specified by applicable U.S. Department of Transportation regulations; (f) the Department shall be immediately notified of any variance, occurring after departure from the shipper's notification of primary routes in South Carolina and estimated date of arrival; (g) All applicable laws and administrative rules and regulations, both State and Federal, regarding the transportation of radioactive wastes will be complied with.

Date: 05/01/03

FedEx Shipment - Exempt
Typed or Printed Name and Title

FedEx Shipment - Exempt
Signature

DHEC 803
(5/80)

(Copies of this form may be reproduced locally as needed)

FORM 540

CHEM-NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

SHIPPING PAPER

1. EMERGENCY TELEPHONE NUMBER (Include Area Code): 800-424-9300

ORGANIZATION: Chemtrek/Cabrera Services

2. IS THIS AN "EXCLUSIVE USE" SHIPMENT? [ ] YES [X] NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST =====> 1

4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT?, If "Yes," provide Manifest Number =====> [ ] YES [X] NO

EPA MANIFEST NUMBER: NA

5. SHIPPER – NAME AND FACILITY
Cabrera Services for
USArmy JMC (Natick MA)
AMSOS-SF
Rock Island, IL 61299

S.C. TRANSPORT PERMIT NUMBER: 0137-00-03-E

SHIPMENT NUMBER: 040526-1

CONTACT: Wade Fillingame

6. CARRIER – Name and Address
FedEX Shipment
THIS IS NOT THE DOT SHIPPING PAPER,

CONTACT: Wade Fillingame

SIGNATURE – *Authorized carrier acknowledging waste receipt*

SHIPMENT I.D. NUMBER: SCN-0062-04

[ ] COLLECTOR
[ ] PROCESSOR
[X] GENERATOR TYPE (Specify) G

TELEPHONE NUMBER (Include Area Code): 865-300-5789

EPA I.D. NUMBER: NA

SHIPPING DATE: 5/27/04

TELEPHONE NUMBER (Include Area Code): 865-300-5789

DATE

7. FORM 540 AND 540A — PAGE 1 OF 1 PAGE(S)
FORM 541 AND 541A — 1 PAGE(S)
FORM 542 AND 542A — None PAGE(S)
ADDITIONAL INFORMATION — None PAGE(S)

8. MANIFEST NUMBER (Use this number on all continuation pages): USA-2004-024-1

9. CONSIGNEE - Name and Facility Address
DCSF
16043 Dunbarton Rd.
Barnwell, SC 29812

CONTACT: Reynolds Black

TELEPHONE NUMBER (Include Area Code): 803-541-5064

SIGNATURE - *Authorized consignee acknowledging waste receipt*

DATE

10. CERTIFICATION

This is to certify that the herein-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. This also certifies that the materials are classified, packaged, marked, and labeled and are in proper condition for transportation and disposal as described in accordance with the requirements of 10 CFR Parts 20 and 61, or equivalent state regulations.

AUTHORIZED SIGNATURE: [signature] TITLE: S.C. BROKER FOR US ARMY ROCK ISLAND DATE: 5/27/04

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information	12. DOT LABEL "RADIOACTIVE"	13. TRANSPORT INDEX	14. PHYSICAL AND CHEMICAL FORM	15. INDIVIDUAL RADIONUCLIDES				16. TOTAL PACKAGE ACTIVITY MBq	mCi	17. LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE
Radioactive material, Type A package, non-special form, non-fissile 7, UN2915 Sources, compasses and DAW	Yellow III	1.5	Solid Oxides	Am-241	C-14	Co-60	Cs-137	3.6168E+04	9.7752E+02	NA	100. LBS; 7.5 FT3	2004-024-1
				H-3	I-129	Ni-63	Ra-226					
				U-nat								

FOR CONSIGNEE USE ONLY

20. "Certification is hereby made to the South Carolina Department of Health and Environmental Control that this shipment of low-level radioactive waste has been inspected in accordance with the requirements of South Carolina Radioactive Material License 287-04 as amended, and the effective consolidation facility acceptance criteria, within 48 hours prior to shipment, and further certification is made that the inspection revealed no items of non-compliance with all applicable laws, rules, and regulations."

Date 5/27/04 Signature [signature]

Title and Organization CABRERA SERVICES FOR USARMY JMC

Telephone No. (865) 300 5789

FORM 540 (10-96)

FORM 541

CHEM-NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and Disposal of Radioactive Waste

1. MANIFEST TOTALS

NUMBER OF PACKAGES/ DISPOSAL CONTAINERS	NET WASTE VOLUME		NET WASTE WEIGHT		SPECIAL NUCLEAR MATERIAL (grams) U-233	U-235	Pu	TOTAL
1	m3	0.1184	kg	24.9476	NP	NP	NP	NP
	ft3	4.1800	lb	55.0000				

ACTIVITY	ALL NUCLIDES	TRITIUM	C-14	Tc-99	I-129	SOURCE	
MBq	3.6168E+04	3.5150E+04	3.8880E-02	NP	4.0700E-03	(kgs)	2.8200E-01
mCi	9.7752E+02	9.5000E+02	1.0508E-03	NP	1.1000E-04	(lbs)	6.2170E-01

2. MANIFEST NUMBER
USA-2004-024-1

3. PAGE 1 OF 1 PAGE(S)

4. SHIPPER NAME
Cabrera Services for

SHIPMENT ID NUMBER
SCN-0062-04

DISPOSAL CONTAINER DESCRIPTION							WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER								
5. CONTAINER IDENTIFICATION NUMBER / S.C. TRANSPORT PERMIT NUMBER	6. CONTAINER DESCRIPTION (See Note 1 & Note 1A)	7. VOLUME (m3) (ft3)	8. WASTE AND CONTAINER WEIGHT (kg) (lb)	9. SURFACE RADIATION LEVEL mSv/hr mrem/hr	10. SURFACE CONTAMINATION MBq/100 cm2 dpm/100 cm2 ALPHA	BETA-GAMMA	PHYSICAL DESCRIPTION 11. WASTE DESCRIPTOR (See Note 2 & Note 2A)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER (m3) (FT3)	13. SOLIDIFICATION OR STABILIZATION MEDIA (See Note 3 & Note 3A)	14. CHEMICAL DESCRIPTION CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF>0.1%	15. RADIOLOGICAL DESCRIPTION INDIVIDUAL RADIONUCLIDES AND ACTIVITY (MBq) AND CONTAINER TOTAL; OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT RADIONUCLIDES	MBq	mCi	16. WASTE CLASSIFICATION AS-Class A Stable AU-Class A Unstable B-Class B C-Class C
2004-024-1/0137-00-04-E AMSOS-SF Rock Island, IL 61299	4	0.2124	45.3592	1.2000E-01	<3.3400E-06	<3.3400E-05									C
		7.5000	100.0000	1.2000E+01	<2.000E+02	<2.000E+03									
0137-00-04-E AMSOS-SF Rock Island, IL 61299							36-H	0.0193	100 90	Oxides/none	0.00	Am-241	6.6600E-04	1.8000E-05	
								0.6800				C-14	1.8796E-03	5.0800E-05	
												Co-60	4.5510E+02	1.2300E+01	
												Cs-137	9.2500E-03	2.5000E-04	
												H-3	3.5150E+04	9.5000E+02	
												I-129	4.0700E-03	1.1000E-04	
												Ni-63	5.5500E+02	1.5000E+01	
												Ra-226	5.5500E-01	1.5000E-02	
												Subtotal	3.6161E+04	9.7732E+02	
0137-00-04-E AMSOS-SF Rock Island, IL 61299							39-H	0.0991	100 100	Oxides/none	0.00	C-14	3.7000E-02	1.0000E-03	
								3.5000				H-3	3.7000E-02	1.0000E-03	
												U-nat [2.8200E-01 kgs]	7.4000E+00	2.0000E-01	
												Subtotal	7.4740E+00	2.0200E-01	
												Total Source: [2.8200E-01 kgs]	3.6168E+04	9.7752E+02	
Shipment Totals		0.2124	45.3592									Source: [2.8200E-01 kgs]	3.6168E+04	9.7752E+02	
		7.5000	100.0000												

NOTE 1: Container Description Codes. For containers/ waste requiring disposal in approved structural over-packs the numerical code must be followed by "-OP."

1. Wooden Box or Crate
2. Metal Box
3. Plastic Drum or Pail
4. Metal Drum or Pail
5. Metal Tank or Liner
6. Concrete Tank or Liner
7. Polyethlene Tank or Liner
8. Fiberglass Tank or Liner
9. Demineralizer
10. Gas Cylinder
11. Bulk, Unpackaged Waste
12. Unpackaged Components
13. High Integrity Container
19. Other. Describe in Item 6, or additional page.

Note 1A: Barnwell Specific Container Description Codes. (Choose one code as may be applicable.)

A High Integrity Container - Poly
B High Integrity Container - Poly with Steel Shell
C High Integrity Drum Overpack - Poly
D High Integrity Container - Stainless Steel
E High Integrity Container - Fiberglass
F Liner - Steel

NOTE 2: Waste Descriptor Codes. (Choose up to three which predominate by volume.)

20. Charcoal
21. Incinerator Ash
22. Soil
23. Gas
24. Oil
25. Aqueous Liquid
26. Filter Media
27. Mechanical Filter
28. EPA or State Hazardous
29. Demolition Rubble
30. Cation Ion-exchange Media
31. Anion Ion-exchange Media
32. Mixed Bed Ion-exchange Media
33. Contaminated Equipment
34. Organic Liquid (except oil)
35. Glassware or Labware
36. Sealed Source/Device
37. Paint or Plating
38. Evaporator Bottoms/Sludges/ Concentrates
39. Compactible Trash
40. Noncompactible Trash
41. Animal Carcass
42. Biological Material (except animal carcass)
43. Activated Material
59. Other. Describe in Item 11, or additional page

Note 2A: Barnwell Specific Waste Descriptor Codes (Choose all applicable codes.)

G Dewatered
H Solid
I Combustible
J Non-combustible
K Air Filtration Filters
L Asbestos

Note 3: Solidification and Stabilization Media Codes. (Choose up to three which predominate by volume.) For media meeting disposal site structural stability requirements, the numerical code must be followed by "-S" and the media vendor and brand name must also be identified in Item 13. Code 100=NONE REQUIRED.

Solidification
90. Cement
91. Concrete (encapsulation)
92. Bitumen
93. Vinyl Chloride
94. Vinyl Ester Styrene
99. Other. Describe in item 13, or additional page
100. None Required.

Note 3A: Barnwell Specific Solidification and Stabilization Media Codes (Choose this code if applicable)

M Wax Binder

FORM 541 (10-96)

Sealed and Check Source
Radionuclide Inventory Worksheet

Item No.	Isotope	Activity µCi	Date Measured	Comments	30.70 Schedule A 30.71 Schedule B Liquid	Solid
3	Am-241	.018	7/6/84	Solid, Room # P-101	General Licensed Item, Title 10, CFR, 31.8a(1)	
4	C-14	0.0508	1/21/88	Solid, Room # P-101	8E-3 µCi/ml	100 µCi
11	I-129	0.017	2/80	Solid, Simulated I-125, Room # P-101	None	0.1 µCi
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
20	I-129	0.093	1/75	Solid, Simulated I-125, Room # P-101	None	0.1 µCi
22	Co-60	0.11	7/21/67	Liquid, Room # P-101	5E-4 µCi/ml	1 µCi
25	Co-60	4300	1/11/71	Solid, NEN SN 218237, Room # P-101	Specific Licensed Material	
26	Cs-137	0.25	5/89	Solid, Room # P-101	None	10 µCi
27	Co-60	8000	12/17/90	Solid, DuPont Sealed Source, SN CD 356, Mfg. No. NER-580, Room # P-101	Specific Licensed Material	
28	Fe-55	1E2	1015/01	Solid, Isotope Products Laboratory, Cat No. GF-0087, Room # R-226, POC David Ziegler, x6484	8E-3 µCi/ml	100 µCi
51	H-3	2E5	9/15/83	Solid, 3M Static Meter, Model 703, SN 77031, Climatic Chamber, POC Leonard Sousa, x5294	General Licensed Item	
52	Ni-63	1E4	12/28/94	Solid, HNU Systems GC, Mfg. No. 300-15A, SN 252004 Room # R-030 POC John McHugh, x5404	General Licensed Item	
53	Ni-63	1.32E4	11/07/96	Solid, Hewlett-Packard GC, Model 5890, SN K3409 Room # D-127 POC Joel Carlson, x5055	General Licensed Item	
54	Ni-63	1.5E4	06/29/89	Solid, Hewlett-Packard GC, Model 5890A, SN L4657, In Storage LLRW, Room # P-101	Specific Licensed Material	
55	H-3	2.5E4	5/12/99	Solid, Sentex Systems GC, Scentograph Plus II, SN 50319-3, Room # D-331 POC Walter Zukas, x5656	General Licensed Item	
56	Ba-133	1.82E1	1/18/89	Solid, Packard LSC Model A1600, SN 101812 Room # P-100, POC Paul Angelis, x5208	General Licensed Item	
57	Ba-133	1.82E1	7/1/94	Solid, Packard LSC Model C1900, SN B815 Room #, POC Steven Arcidiacono, x4983	General Licensed Item	

RAD WASTE DISPOSAL LOG

Isotope: H-3 Half-Life: 12.43 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: 27 May 2004

Date Rec.	Principle User	SOP#	Activity	Bag No.
12/27/01	J.F. Sieckarski	N/A	<1.0 µCi	N/A
2/6/02	J.F. Sieckarski	N/A	<25.0 µCi	N/A

RAD WASTE DISPOSAL LOG

Isotope: C-14 Half-Life: 5730 yrs 10 Half-Life: Not Applicable
Age & Decay: Not Applicable Ship Off-Site: 27 May 2004

Date Rec.	Principle User	SOP#	Activity	Bag No.
05/08/98	J.F. Sieckarski	N/A	<1.0 µCi	N/A
09/01/98	J.F. Sieckarski	"	<1.00 "	N/A
09/06/00	J.F. Sieckarski	"	<1.10 "	N/A
07/31/01	J.F. Sieckarski	"	<0.05 "	N/A

CAUTION

RADIOACTIVE MATERIAL

ISOTOPE 14C

AMOUNT < 1.0 μCi

DATE 5/8/98 BY JFS

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

BAIRD ATOMIC INC.
CAMBRIDGE, MASS.

10402

CAUTION

RADIOACTIVE MATERIAL

ISOTOPE 14C

AMOUNT > 1 μCi

DATE 10/5/98 BY J Sedymski

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

BAIRD ATOMIC INC.
CAMBRIDGE, MASS.

10402

CAUTION

RADIOACTIVE MATERIAL

ISOTOPE 14C

AMOUNT < 1.0 μCi

DATE 9/1/98 BY DFP-4758

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

BAIRD ATOMIC INC.
CAMBRIDGE, MASS.

10402

CAUTION

RADIOACTIVE MATERIAL

ISOTOPE 14C

AMOUNT 1 μCi

DATE 09/6/00 BY JFS

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION OF

BAIRD ATOMIC INC.
CAMBRIDGE, MASS.

10402