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**LIST OF DOE RADIOISOTOPE CUSTOMERS WITH
SUMMARY OF RADIOISOTOPE SHIPMENTS, FY 1986**

PNL--6361

D. A. Lamar

DE88 001694

October 1987

Prepared for
the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Richland, Washington 99352

MASTER

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Larry E. Williams
Authorizing Official

Date: *06/13/2007*

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ABSTRACT

This edition of the radioisotope customer list was prepared at the request of the Office of Health and Environmental Research (ER-73), Office of Energy Research, U.S. Department of Energy (DOE). This document describes radioisotope distribution from DOE facilities to private firms including foreign and other DOE facilities.

The information is divided into five sections: 1) isotope suppliers, facility contact, and isotopes or services supplied; 2) customers, suppliers, and isotopes purchased; 3) isotopes purchased cross-referenced with customer numbers; 4) geographic locations of radioisotope customers; and 5) radioisotope sales and transfers for fiscal year 1986.

ACKNOWLEDGMENTS

The compiler thanks the following laboratories and U.S. Department of Energy Area Offices for their annual contributions from which this report is compiled:

Argonne National Laboratory
Brookhaven National Laboratory
Hanford Engineering Development Laboratory
Idaho National Engineering Laboratory/EG&G Idaho, Inc.
Los Alamos National Laboratory
Oak Ridge National Laboratory
Pacific Northwest Laboratory
Savannah River Plant/DOE
UNC Nuclear Industries, Inc.

LIST OF PREVIOUS REPORTS

Previous reports in this series are listed below by report number and fiscal year that radioisotopes were received. All of these reports were actually published in the year following the year given (e.g., TID-2160 reports fiscal year 1964 activities, but the report publication date was 1965).

TID-2160 (FY 1964)	ORNL-IIC-38 (FY 1971)	PNL-2930 (FY 1978)
ORNL-IIC-6 (FY 1965)	BNWL-1774 (FY 1972)	PNL-3274 (FY 1979)
ORNL-IIC-9 (FY 1966)	BNWL-1824 (FY 1973)	PNL-3839 (FY 1980)
ORNL-IIC-13 (FY 1967)	BNWL-1902 (FY 1974)	PNL-4177 (FY 1981)
ORNL-IIC-17 (FY 1968)	BNWL-1993 (FY 1975)	PNL-4759 (FY 1982)
ORNL-IIC-27 (FY 1969)	BNWL-2147 (FY 1976)	PNL-5126 (FY 1983)
ORNL-IIC-32 (FY 1970)	PNL-2572 (FY 1977)	PNL-5492 (FY 1984)
		PNL-5948 (FY 1985)

Similar reports covering the U.S. Department of Energy's stable isotopes' distribution programs have also been prepared and are available from the National Technical Information Center, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161.

Stable Isotope Sales: Mound Facility Customer and Shipment Summary.

Report Number and Date:

MLM-2718 (FY 1979)	MLM-3095 (FY 1982)
MLM-2843 (FY 1980)	MLM-3234 (FY 1983)
MLM-2994 (FY 1981)	MLM-3366 (FY 1984)

Stable Isotope Customer List and Summary of Shipments.

Report Number and Date:

ORNL/TM-7214 (FY 1979)	ORNL/TM-8979 (FY 1983)
ORNL/TM-7764 (FY 1980)	ORNL/TM-9430 (FY 1984)
ORNL/TM-8302 (FY 1981)	ORNL/TM-9866/R1 (FY 1985)
ORNL/TM-8704 (FY 1982)	ORNL/TM-10324 (FY 1986)

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LIST OF ABBREVIATIONS

AG-105	Silver-105	Ci	Curie
AL-26	Aluminum-26	CM-243	Curium-243
AM-241	Americium-241	CM-244	Curium-244
AM-243	Americium-243	CM-248	Curium-248
AO	Administration Only; no shipments made from site	CO-57	Cobalt-57
		CO-58	Cobalt-58
AT-211	Astatine-211	CO-60	Cobalt-60
AU-195	Gold-195	cs-137	Cesium-137
AU-198	Gold-198	CSI	Cyclotron Service Irradiations
B-11	Boron-11	CSI-B	Cyclotron Service Irradiations by Brookhaven
BA-140	Barium-140	CSI-L	Cyclotron Service Irradiations by Los Alamos
BE-7	Beryllium-7	CU-65	Copper-65
BK-249	Berkelium-249	DU	Depleted Uranium
BR-77	Bromine-77	E	Enriched
BR-82	Bromine-82	ES-253	Einsteinium-253
C-11	Carbon-11	EU	Enriched Uranium
C-14	Carbon-14	EU-152	Europium-152
CA-47	Calcium-47	F-18	Fluorine-18
CAP	Encapsulation	FE-52	Iron-52
CD-109	Cadmium-109	FE-55	Iron-55
CE-139	Cerium-139	FE-59	Iron-59
CE-144	Cerium-144	FP	Fission Products
CF-249	Californium-249	g	Gram
CF-252	Californium-252		

GA	Gallium-67	MS	Miscellaneous Services
GD-148	Gadolinium-148	PIA-22	Sodium-22
GD-153	Gadolinium-153	NA-24	Sodium-24
GE-68	Germanium-68	NB-95	Niobium-95
H-3	Hydrogen-3 (tritium)	NI-63	Nickel-63
HF-172	Hafnium-172	NP-237	Neptunium-237
HO-163	Holmium-163	NP-237H	High Purity NP-237
I-123	Iodine-123	NP-2370	Oxide of NP-237
1-129	Iodine-129	NU	Natural Uranium
1-131	Iodine-131	os-191	Osmium-191
IN-111	Indium-111	P-33	Phosphorus-33
IR-192	Iridium-192	PA-231	Protactinium-231
kCi	Kilocurie	PD-109	Palladium-109
kg	Kilogram	PM-147	Promethium-147
KR-85	Krypton-85	PO-208	Polonium-208
KR-85E	Enriched Krypton-85	PU-236	Plutonium-236
LU-172	Lutetium-172	PU-237	Plutonium-237
LU-173	Lutetium-173	PU-238	Plutonium-238
MCP	Miscellaneous Compound Preparations	PU-239	Plutonium-239
μ Ci	Microcurie	PU-240	Plutonium-240
μ g	Microgram	PU-241	Plutonium-241
mCi	Millicurie	PU-242	Plutonium-242
mg	Milligram	RB-81	Rubidium-81
MG-28	Magnesium-28	RB-83	Rubidium-83
MI	Miscellaneous Isotopes	RB-86	Rubidium-86
MIS	Miscellaneous Quantities	RSI	Reactor Service Irradiations

RU-97	Ruthenium-37	TS	Technical Service
RU-103	Ruthenium-103	U-233	Uranium-233
RU-106	Ruthenium-106	U-234	Uranium-234
RW	Radioisotopes Withdrawn; prepared under special approval	U-235	Uranium-235
		U-236	Uranium-236
SE-75	Selenium-75	U-238	Uranium-238
SI-31	Silicon-31	V-48	Vanadium-48
SI-32	Silicon-32	v-54	Vanadium-54
SM-151	Samarium-151	XE-127	Xenon-127
SN-117	Tin-117	Y-87	Yttrium-87
SP	Special Processing	Y-88	Yttrium-88
SR-82	Strontium-82	ZN-65	Zinc-65
SR-89	Strontium-89	ZR-95	Zirconium-95
SR-90	Strontium-90		
SS	Special Services		
TC-99	Technetium-99		
TE-128	Tellurium-128		
TH-229	Thorium-229		
TH-230	Thorium-230		
TH-232	Thorium-232		
TH-234	Thorium-234		
TI-44	Titanium-44		
TM-167	Thulium-167		
TM-170	Thulium-170		
TP	Target Preparations		
TB-158	Terbium-158		

1. ISOTOPE SUPPLIERS, FACILITY CONTACT, AND
ISOTOPES OR SERVICES SUPPLIED

This section lists suppliers of isotopes and the contact person for each DOE facility, and lists the isotopes supplied or describes the services rendered. If readers need more specific information about isotope sales or shipments for a particular facility, they should contact the person listed for that facility.

ISOTOPE SUPPLIERS, FACILITY CONTACT, AND ISOTOPES OR SERVICES SUPPLIED

<u>Isotope Supplier</u>	<u>Supplier Code</u>	<u>Facility Contact</u>	<u>Isotopes or Service</u>
Argonne National Laboratory	ANL	B. Z. Friddle Chemistry Division Argonne National Laboratory 9700 S. Cass Ave. Argonne, IL 60439 FTS 972-3579 Commercial (312) 972-3425	No isotopes sold directly. Isotopes produced counted in ORNL sales.
Brookhaven National Laboratory	BNL	K. S. Dahms Isotopes and Special Materials Group Brookhaven National Laboratory Upton, NY 11973 FTS 666-4051 Commercial (516) 282-4051	AM-241, AT-211, CD-109, CF-252, CM-244, CO-60, CS-137, CSI, CU-64, CU-67, F-18, GE-68, H-3, I-123, I-131, IN-111, MG-28, MI, NA-22, NI-63, P-32, PU-239, OS-191, RST, RU-97, SR-82, SR-90, TE-128, TH-232, U-235, U-238, XE-127
Idaho National Engineering Laboratory	INEL	J. T. Parks EG&G Idaho, Inc. Idaho National Engineering Laboratory P.O. Box 1625 Idaho Falls, ID 83415 FTS 583-4266 Commercial (208) 526-4266	RSI, CO-60
Los Alamos National Laboratory	LANL	K. E. Peterson Group INC-11, Mail Stop 5514 Los Alamos National Laboratory Los Alamos, NM 87545 FTS 843-4675 Commercial (505) 667-4675	AL-26, BE-7, BR-77, BR-82, CO-56, CD-109, CU-64, CU-67, GE-68, NA-22, RB-83, SI-32, SR-82, TI-44, XE-127, Y-88

<u>Isotope Supplier</u>	<u>Supplier Code</u>	<u>Facility Contact</u>	<u>Isotopes or Service</u>
Oak Ridge National Laboratory	ORNL	T. A. Danner Isotope Distribution Office Oak Ridge National Laboratory P.O. Box X Oak Ridge, TN 37830 FTS 624-6506 Commercial (615) 574-6506	AM-241, AM-243, CAP, CE-144, CF-249, CF-252, CM-244, CM-248, CO-60, CS-137, CSI, FE-55, GD-153, H-3, I-129, IR-192, KR-85, KR-85E, MCP, MG-28, MS, NP-237H, NP-2370, P-33, PA-231, PM-147, RSI, PU-236, PU-237, PU-238, PO-237, PU-240, PU-241, PU-242, RU-103, RU-106, RW, SE-75, SM-151, SP, SR-89, SR-90, SS, TC-99, TH-229, TH-230, TH-232, TP, U-233, U-234, U-235, U-236, U-238, XE-127, Y-90, ZR-95
Pacific Northwest Laboratory	PNL	O. P. Amacker Safeguards Section Pacific Northwest Laboratory P.O. Box 999 Richland, WA 99352 FTS 375-2819 Commercial (509) 375-2819	No isotopes produced in FY 1986
Savannah River Plant	SRP	R. L. Chandler Process & Weapons Division Department of Energy P. O. Box A Aiken, SC 29801 FTS 239-5547 Commercial (803) 725-5547	CF-252

<u>Isotope Supplier</u>	<u>Supplier Code</u>	<u>Facility Contact</u>	<u>Isotopes or Service</u>
UNC Nuclear Industries, Inc.	UNC	A. P. Larrick, Manager Chemistry & Waste Treatment Technology Operations Division UNC Nuclear Industries P. O. Box 490 Richland, WA 99352 FTS 444-4927 Commercial (509) 373-4927	TM-170
Westinghouse Hanford Company	WHC (HEDL) (a)	W. R. Brooksher, Manager Safeguards and Security Westinghouse Hanford Company P.O. Box 1970 Richland, WA 99352 FTS 444-9927 Commercial (509) 376-9927	No isotopes produced in FY 1986

(a) Supplier Code during **FY** 1986.

2. LIST OF CUSTOMERS, SUPPLIERS, AND ISOTOPES PURCHASED

This section is an alphabetical listing of domestic and foreign radio-isotope customers and their addresses. Each customer has a customer number that *is* used to cross-reference data in the other sections of the report. Isotope purchases for each customer are listed below each address, along with the supplier code for the laboratory supplying the isotopes.

ALPHABETICAL LISTING (BY COUNTRY) OF CUSTOMERS,
SUPPLIERS. AND ISOTOPES PURCHASED

UNITED STATES

<p>1 AT&T Technologies Inc.
P.O. Box 105201
Atlanta, GA 30348

ORNL: KR-85</p> <p>2 AT&T Bell Laboratories
P.O. Box 800
Short Hills, NJ 07078

ORNL: SS</p> <p>3 AT&T Technologies
P.O. Box 105229
Atlanta, GA 30348

ORNL: KR-85</p> <p>4 Advanced Medical Systems, Inc.
621 Factory Row
Geneva, OH 44041

ORNL: CO-60, MCP, SR-89, SS</p> <p>5 Advanced Micro Devices, Inc.
P.O. Box 453
Sunnyvale, CA 94086

ORNL: KR-85</p> <p>6 Aeonic Systems, Inc.
46 Manning Road
Billerica, MA 01821

ORNL: KR-85</p> <p>7 Albert Einstein College of
Medicine
1300 Morris Park Avenue
Bronx, NY 10461

LANL: CU-67
ORNL: CSI</p> | <p>8 Allen-Bradley Company
136 W. Greenfield Avenue
Milwaukee, WI 53204

ORNL: KR-85</p> <p>9 Analytics Incorporated
1094 Hemphill Avenue
Atlanta, GA 30318

BNL : XE-127
ORNL: XE-127</p> <p>10 Argonne National Laboratory
9700 South Cass Avenue
Argonne, IL 60439

BNL : U-238
ORNL: CE-144, SP</p> <p>11 Argonne National Laboratory
P.O. Box 2528
Idaho Falls, ID 83401

ORNL: SP, TH-230</p> <p>12 Asarco Smelting Company
Globe Plant
495 East 51st Avenue
Denver, CO 80216

BNL : CF-252</p> <p>13 Babcock and Wilcox Company
Research and Development D v.
1562 Beeson Street
Alliance, OH 44601

ORNL: NP-237, U-235, U-238</p> <p>14 Bell Telephone Laboratories
Murray Hill, NJ 07971

BNL : U-238</p> |
|--|---|

<p>15 Bendix Corporation, The
2000 East Bannister Road
Kansas City, MO 64131</p> <p>ORNL: PM-147, SS</p>	<p>22 Carolina Power and Light Co.
P.O. Box 1551
Raleigh, NC 27602   ORNL: CE-144, CS-137, RU-106,
ZR-95</p>
<p>16 Bionetics Research, Inc.
Biotechnology Division
1330A Piccard Drive
Rockville, MD 20850</p> <p>BNL : 1-131</p>	<p>23 Case-Western Reserve University
2220 Circle Drive
Cleveland, OH 44106   BNL : MG-28
ORNL: MG-28</p>
<p>17 Biosources, Limited
4-4 Bud Way
Nashua, NH 03063</p> <p>ORNL: GD-153, SS</p>	<p>24 Center for Molecular Medicine
100 Bergen Street
Newark, NY 07103</p> <p>ORNL: CSI</p>
<p>18 Brigham & Women's Hospital
10 Vining Street
Boston, MA 02115</p> <p>ORNL: GD-153</p>	<p>25 Chem-Nuclear Systems, Inc.
220 Stoneridge Drive
Columbia, SC 29210</p> <p>ORNL: CO-60, CS-137, SS</p>
<p>19 Brookhaven National Laboratory
Isotopes & Special Metals Group
Upton, Long Island, NY 11973   LANL: XE-127
ORNL: H-3, RU-103, XE-127</p>	<p>26 Children's Medical Center
300 Longwood Avenue
Boston, MA 02115</p> <p>ORNL: CSI , MCP</p>
<p>20 California State University
800 North State College
Fullerton, CA 92624</p> <p>LANL: CU-67</p>	<p>27 Ciba Geigy Corporation
181 Passaic Avenue
Summit, NJ 07901   BNL : MG-28
ORNL: MG-28</p>
<p>21 Calm VA-1 (525)
P.O. Box 2971
Austin, TX 78769</p> <p>ORNL: XE-127</p>	<p>28 Cintichem, Incorporated
P.O. Box 6950
Richmond, CA 94806</p> <p>ORNL: TP, U-238</p>

<p>29 City of Hope Medical Center
1500 E. Duarte Road
Duarte, CA 91010</p> <p>GRNL: MCP</p>	<p>36 Digital Equipment Corp.
100 Minuteman Road
Andover, MA 01810</p> <p>ORNL: KR-85</p>
<p>30 Columbia University
538 West 120 Street
New York, NY 10027</p> <p>BNL : CU-67, I-131</p>	<p>37 Dow Chemical USA
Texas Operations
Freeport, TX 77541</p> <p>ORNL: Y-90</p>
<p>31 Computer Technology & Imaging
215 Center Park Drive
Suite 1500
Knoxville, TN 37922   LANL: GE-68
ORNL: CSI</p>	<p>38 Dr. Stuart L. Adelman
44 McAllister Street
San Francisco, CA 94102</p> <p>ORNL: TC-99</p>
<p>32 Consolidated Controls Corp.
P.O. Box 726
Springfield, VA 22150</p> <p>ORNL: H-3, MCP</p>	<p>39 Duke University
Durham, NC 27706</p> <p>ORNL: CSI</p>
<p>33 Coulter Immunology
440 West 20th Street
Hialeah, FL 33020</p> <p>ORNL: Y-90</p>	<p>40 E. I. DuPont de Nemours
& Company, Inc.
Nuclide and Source Division
Treble Cove Road
Billerica, MA 01862</p> <p>BNL : GE-68, SR-82</p>
<p>34 Cryogenic Rare Gas
Laboratories, Inc.
46 Liberty Street
Newark, NJ 07103</p> <p>ORNL: KR-85</p>	<p>41 E. I. DuPont de Nemours
& Company, Inc.
Radiopharmaceutical Division
601 Treble Cove Road
Billerica, MA 01862</p> <p>BNL : GE-68</p>
<p>35 Cytogen Corporation
201 College Road East
Princeton, NJ 08540</p> <p>ORNL: Y-90</p>	<p>42 E. I. DuPont de Nemours
& Company, Inc.
Experimental Station
Wilmington, DE 19898</p> <p>ORNL: MCP, TC-99</p>

43 E. I. DuPont de Nemours &
Company
NEN Products
Accounts Payable
549 Albany Street
Boston, MA 02118

ORNL: CE-144, CSI, GO-153,
H-3, I-129, KR-85,
MG-28, P-33, RW,
SR-90, SS, TC-99

44 E. R. Squibb & Sons
P.O. Box CN 5303
Princeton, NJ 08540

ORNL: CSI, GD-153, MG-28

45 E. I. DuPont de Nemours &
Company, Inc.
Savannah River Plant
Aiken, SC 29801

LANL: CD-109
ORNL: CS-137, CSI, MCP, MS,
PM-147, SS

46 E. R. Squibb and Sons
Radio Pharmaceutical R & D
Route 1 via Gate 125
New Brunswick, NJ 08901

BNL : SR-82
LANL: SR-82

47 EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, ID 83415

INEL: RSI
ORNL: AM-241, CE-144, MS,
NP-237, TP, ZR-98

48 Eberline Instrument Corp.
P.O. Box 279
Santa Fe, NM 87501

ORNL: XE-127

49 Elymat Industries
Englewood Cliffs, NJ 07632

ORNL: SS

50 Environmental Processing, Inc.
1321 N. Plano Road
Richardson, TX 75801

ORNL: KR-85

51 Fairchild
MHS Division
P.O. Box 5000
Puyallup, WA 98373

ORNL: KR-85

52 Fairchild Camera & Instrument
Corporation
Linear Division
P.O. Drawer 7282
Mountainview, CA 94042

ORNL: KR-85

53 Fairchild Semiconductor
333 Western Avenue
Portland, ME 04016

ORNL: KR-85

54 Fermi National Accelerator Lab.
Batavia, IL 60510

BNL : CS-137

- 55 Florida State University
Tallahassee, FL 32306

ORNL: MS
- 56 Frontier Tech
1641 Burnett Drive
Xenia, OH 45385

SRL : CF-252
- 57 G. E. Intersil Inc.
10710 North Tantau Avenue
Cupertino, CA 95014

ORNL: KR-85
- 58 GA Technologies
P.O. Box 85608
San Diego, CA 92138

ORNL: SS
- 59 Gamma Industries, Inc.
P.O. Box 2543
Baton Rouge, LA 70821

ORNL: IR-192, SS
- 60 General Electric Company
Space Systems Division
P.O. Box 13098
Philadelphia, PA 19101

ORNL: KR-85
- 61 General Electric Company
Vallecitos Nuclear Company
Vallecitos Road
Pleasanton, CA 94566

INEL: CO-60
SRL : CF-252
- 62 General Electric Company
P.O. Box 254
San Jose, CA 95103

ORNL: AM-241, CO-60, MCP,
SR-89, SS, U-238
- 63 General Semiconductor,
Incorporated
2001 West 10th Place
Tempe, AZ 85281

ORNL: KR-85
- 64 Genicom Corporation
One General Electric Drive
Waynesboro, VA 22980

ORNL: KR-85
- 65 George Washington University
Academic Center
801 22nd Street
Washington, DC 20056

ORNL: MCP, Y-90
- 66 Georgia Institute of Technology
Nuclear Research Center
225 North Avenue, N.W.
Atlanta, GA 30332

ORNL: H-3, KR-85
- 67 Gollob Analytical Service
Corporation
47 Industrial Road
Berkeley Heights, NJ 07922

ORNL: H-3, KR-85
- 68 Gulf Nuclear, Inc.
202 Medical Center
Webster, TX 77598

ORNL: CS-137, GO-153, MCP

<p>69 Harris Semiconductor
P.O. Box 883
Melbourne, FL 32901</p> <p>ORNL: CE-144, KR-85</p>	<p>76 Hybritech Incorporated
9850 Distribution Avenue
San Diego, CA 92121</p> <p>ORNL: SS, XE-127, Y-90</p>
<p>70 Harrison Radiator
200 Upper Mountain Road
Lockport, NY 14094</p> <p>ORNL: KR-85</p>	<p>77 ICI America, Inc.
Atlas Aerospace Division
Valley Forge, PA 19481</p> <p>ORNL: KR-85</p>
<p>71 Harvard Medical School
Shields Warren Laboratory
50 Binney Street
Boston, MA 02115</p> <p>ORNL: MCP</p>	<p>78 IBM Corporation
P.O. Box 9452
New Haven, CT 06534-0452</p> <p>ORNL: TP</p>
<p>72 Hewlett Packard
Microwave Semiconductor Division
350 West Trimble Road
San Jose, CA 95131</p> <p>ORNL: KR-85</p>	<p>79 ICI America, Inc.
Export Purchasing
P.O. Box 751
Wilmington, DE 19897</p> <p>ORNL: KR-85</p>
<p>73 Honeywell
1150 East Cheyenne Mountain Blvd
Colorado Springs, CO 80906</p> <p>ORNL: KR-85</p>	<p>80 ICN Biomedicals, Inc.
P.O. Box 19536
Irvine, CA 92714   ORNL: H-3, PM-147, RU-106,
SE-75, SR-90</p>
<p>74 Hughes Aircraft Company
P.O. Box 92907
Los Angeles, CA 90009</p> <p>ORNL: KR-85</p>	<p>81 Immunomedics , Inc.
100 Bergen Street
Newark, NJ 07103</p> <p>BNL : CU-67</p>
<p>75 Hunter College
695 Park Avenue
New York, NY 10021</p> <p>LANL: CU-67</p>	<p>82 Industrial Nuclear Company
1124 Chess Drive
Foster City, CA 94404</p> <p>ORNL: IR-192</p>

- 83 Iotech, Incorporated
5995 South Syracuse
Suite 201.
Englewood, CO 80111

ORNL: CO-60
- 84 Isotope Products Laboratories
404 South Luke Street
Burbank, CA 91502

BNL : H-3
LANL: Y-88
ORNL: CAP, CE-144, CF-249, CF-252,
CM-244, FE-55, GO-153, I-129,
KR-85, MS, PM-147, RU-106,
RW, SE-75, SP, SR-90, TH-230,
TP, U-236
- 85 Iovac Engineering Company
6220 San Fernando Road
Glendale, CA 92104
ORNL: KR-85
- 86 J. L. Shepherd and Associates
1010 Arroyo St.
San Fernando, CA 91340

ORNL: CO-60, CS-137, MCP, RSI,
SR-89,
- 87 Johns Hopkins University
Baltimore, MD 21218

ORNL: SS, Y-90
- 88 KMS Fusion, Inc.
3941 S. Research Park Drive
P.O. Box 1567
Ann Arbor, M 48106

ORNL: H-3
- 89 Kaman Instrumentation Corporation
P.O. Box 7463
Colorado Springs, CO 80933

ORNL: TP
- 90 Kyocera International, Inc.
8611 Balboa Avenue
San Diego, CA 92123

ORNL: KR-85
- 91 LSI Avionics Systems Corporation
7-11 Vreeland Roak
Florham Park, NJ 07932

ORNL: KR-85
- 92 Lawrence Livermore National
Laboratory
Box 808
Livermore, CA 94550

ORNL: MCP, MS, PM-147,
SP, TC-99, TP
- 93 Litton Industries
Guidance and Control Systems
5500 Conoga Avenue
Woodland Hills, CA 91367

ORNL: KR-85
- 94 Litton Systems, Inc.
Guidance and Control Systems
Division
1001 Redwood Highway Spur
Grants Pass, OR 97526

ORNL: KR-85
- 95 Long Island Jewish Medical Center
New Hyde Park, NY 11042

ORNL: GD-153

96 Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, NM 87545

BNL : AM-241, CU-64, NA-24, U-238
LANL: BE-7, BR-82, CO-56, CU-64,
CU-67, RB-83, SI-32
ORNL: CAP, I-129, MCP, MS, SP,
TP

97 **Lovelace** Biomedical and
Environmental Research Institute
Building 9217, Area Y
Kirtland, NM 87115

LANL: BE-7
ORNL: CSI, SS

98 Mallinckrodt, Inc.
2703 Wagner Place
Maryland Heights, MO 63043

BNL : XE-127
ORNL: SE-75, SS, XE-127

99 Martin Marietta Energy Systems
Y-12 Plant
P.O. Box Y
Oak Ridge, TN 37830

ORNL: IR-192, SS

100 Massachusetts General Hospital
Physics Research Laboratory
Fruit Street
Boston, MA 02114

ORNL: MCP

101 Massachusetts Institute of
Technology
Box 69
Cambridge, MA 02139

BNL : CM-244

102 Medical & Scientific
Enterprises **Incorporated**
75 Union Avenue
Sudbury, MA 01776

ORNL: GD-153

103 Medical Research Foundation
181-A Upper Riverdale Road
Riverdale, GA 30274

ORNL: MCP, SS, Y-90

104 Mercer School of Medicine
Finance Office
1550 College Street
Macon, GA 31207

ORNL: SR-89

105 Methodist Hospital
1604 N. Capitol Avenue
Indianapolis, IN 46202

ORNL: XE-127

106 Micra Corporation
120 Ricefield Lane
Hauppauge, NY 11788

ORNL: KR-85

107 Micro-Rel, Inc.
2340 **West** 10th Place
Tempe, AZ 85280

ORNL: KR-85

108 Milwaukee County Medical Complex
Department of Nuclear Medicine
8700 West Wisconsin Ave.
Milwaukee, WI 53226

BNL : I-123
ORNL: CSI

<p>109 Minnesota Mining Manufacturing Co.
P.O. Box 3121
St. Paul, MN 55101 .</p> <p>ORNL: GO-153, KR-85, SS</p>	<p>116 National Semiconductor Corp.
2900 Semiconductor Drive
Santa Clara, CA 95051</p> <p>ORNL: KR-85</p>
<p>110 Monolithic Memories Incorporated
1275 Mission College Boulevard
Santa Clara, CA 95050</p> <p>ORNL: KR-85</p>	<p>117 National Semiconductor Corp.
5901 S. Calle Santa Cruz
Tucson, AZ 85706</p> <p>ORNL: KR-85</p>
<p>111 Montefiore Hospital
Department of Pediatrics
111 E. 210th Street
Bronx, NY 104.67</p> <p>BNL : CD-109</p>	<p>118 Neutron Products
P.O. Box P (K-1007,M.S. 57)
Oak Ridge, TN 37830</p> <p>ORNL: RSI</p>
<p>112 Moravek Biochemicals, Inc.
577 Mercury Lane
Brea , CA 92621</p> <p>ORNL: H-3</p>	<p>119 Neutron Products, Inc.
P.O. Box 68
Mt. Ephraim Road
Dickerson, MD 20753   INEL: CO-60
ORNL: CO-60, MCP, RSI</p>
<p>113 Motorola, Inc.
3501 Ed Bluestein Boulevard
Austin, TX 78721</p> <p>ORNL: KR-85</p>	<p>120 New York University Medical
Center
550 First Avenue
New York, NY 10016</p> <p>BNL: H-3</p>
<p>114 Motorola, Inc.
5005 East McDowell Road .
Phoenix, AZ 85008</p> <p>ORNL: KR-85</p>	<p>121 North Carolina Memorial Hospital
101 E. Weaver St.
Carrboro, NC 27510</p> <p>ORNL: XE-127</p>
<p>115 Mount Sinai Medical Center
Radiotherapy
17 East 102nd Street
New York City!, NY 10021</p> <p>BNL : AT-211</p>	<p>122 North Carolina Memorial Hospital
Division of Nuclear Medicine
2nd Floor, Old Clinic Building
Chapel Hill, NC 27514</p> <p>BNL : XE-127</p>

- 123 North Shore University Hospital
Department of Nuclear Medicine
300 Community Drive
Manhasset, NY 10030

BNL : RU-97
- 124 Northern Telecom Electronics , Inc.
16350 W. Bernardo Drive
San Diego, CA 92127

ORNL: KR-85
- 125 Northwestern University
619 Clark Street
Evanston, IL 60201

ORNL: MS, SP
- 126 Nuclear Radiation Development,
Incorporated
2937 Alt Boulevard
Grand Island, NY 14072

ORNL: AM-241, CAP, TH-232, TP
- 127 Nuclear Sources and Services
P.O. Box 14023
Houston, TX 77021

ORNL: KR-85
- 128 Oak Ridge Associated Universities
P.O. Box 117
Oak Ridge, TN 37830

LANL: GE-68, TI-44
ORNL: CSI , MCP
- 129 Oak Ridge National Laboratory
P.O. Box X
Oak Ridge, TN 37830

LANL: AL-26, Y-88
ORNL: CE-144, CO-60, CS-137
CSI , GD-153, I-129,
MCP, NP-237, P-33,
PM-147, PU-242, RU-106,
SE-75, SM-151, SP,
SR-89, SR-90, SS,
TH-232, TP, U-235
- 130 Ohio State University
Research Foundation
1314 Kinnear Road
Columbus, OH 43212

BNL : MG-28
ORNL: H-3, MG-28, SR-89, TP
- 131 Oregon State University
Corvallis, OR 97330

ORNL: PU-242, TP, U-238
- 132 Pacific Northwest Laboratory
Battelle-Northwest
P.O. Box 999
Richland, WA 99352

LANL: Y-88
ORNL: AM-241, CAF, CM-244,
CSI , NP-237, SS , TP
UNC : TM-170
- 133 Pett Electronics
858 Hanley Industrial Ct.
St. Louis, MO 63144

LANL: GE-68
- 134 Poretics Corporation
151 I Lindbergh Avenue
Livermore, CA 94550

ORNL: TP, U-235

<p>135 Potter and Brumfield
Princeton, IN 47570

ORNL: KR-85</p> <p>136 Precision Monolithics Puerto Rico Incorporated
Puerto Real Industrial Park
Road 195 KM 1.5 - P.O. Box 1089
Fajardo, Puerto Rico 00648

ORNL: KR-85</p> <p>137 Program Resources, Inc.
P.O. Box B
Frederick, MD 21701-1013

ORNL: SR-89</p> <p>138 Purdue University
Pharmacy Annex.
Lafayette, IN 47907

ORNL: TC-99</p> <p>139 RCA
Raritan, NJ 08869

ORNL: KR-85</p> <p>140 Radiation Sterilizers, Inc.
3000 Sand Hill Road
Suite 2-190
Menlo Park, CA 94025

ORNL: RSI</p> <p>141 Radiation Technology, Inc.
108 Lake Denmark Road
Rockaway, NJ 07866

ORNL: RSI</p> | <p>142 Raytheon Company
350 Ellis Street
Mountain View, CA 94042

ORNL: KR-85</p> <p>143 Raytheon Company
350 Lowell Street
West Andover, MA 01810

ORNL: KR-85</p> <p>144 Reactor Experiments, Inc.
963 Terminal Way
San Carlos, CA 94070

ORNL: NP-237, TH-232, TP
U-235, U-238</p> <p>145 Rensselaer Polytechnic Institute
110 8th Street
Troy, NY 12181

BNL : MG-28
ORNL: CSI, MG-28</p> <p>146 Reuter-Stokes, Inc.
Edison Park
8499 Darrow Road
Twinsburg, OH 44087

ORNL: SP, TP, U-234, U-238</p> <p>147 Rockwell Hanford Company
P.O. Box 769
Richland, WA 99352

ORNL: PU-236, ZR-95</p> <p>148 Rockwell International
Atomics International Division
Rocky Flats Plant
P.O. Box 464
Golden, CO 80401

BNL : U-235</p> |
|---|--|

149 Safety Light Corporation
4150-A Old Berwick Road
Bloomsburg, PA 17815

ORNL: H-3

150 Sandia Coporation
P.O. Box 5800
Albuquerque, NM 87115

ORNL: MS

151 Science Applications
3 Choke Cherry Road
Rockville, MD 20850

ORNL: KR-85, PU-236

152 Self Powered Lighting, Ltd.
8 Westchester Plaza
Elmsford, NY 10523

ORNL: H-3

153 Signet ics Corporation
1275 South 800 East
Orem, UT 84057

ORNL: KR-85

154 Signetics Incorporated
811 East Argues Avenue
P. O. Box 3409
Sunnyvale, CA 94088-3409

ORNL: KR-85

155 Siliconix, Inc.
Mail Stop 60
2201 Laurelwood Road
Santa Clara, CA 95054

ORNL: KR-85

156 Sloan-Kettering Institute
425 East 68th Street
New York, NY 10021

ORNL: CSI

157 Smithsonian Institution
Conservation Analytical
Laboratory
4210 Silver Hill Road
Suitland, MD 20746

BNL: AM-241

158 Source Production and
Equipment Co., Inc.
625 Oxtley Street
Kenner, LA 70062

ORNL: IR-192

159 Sprague Solid State
3900 Welsh Road
Willow Grove, PA 19090

ORNL: KR-85

160 Stanford University
P.O. Box 4409
Stanford, CA 94305

ORNL: Y-90

161 State University of New York
at Stony Brook
University Hospital
Stony Brook, NY 11794

BNL : 1-131

162 State University of New York
at Stony Brook
Research Foundation
Stony Brook, NY 11790

BNL : CM-244, F-18, I-123, I-131
ORNL: SP, TH-230

- 163 State of New Jersey
Department of Environmental
Protection
Division for Environmental Quality
Bureau of Environmental Laboratories
Trenton, NJ 08625

ORNL: SP
- 164 TRW Systems Group
One Space Park:
Redondo Beach, CA 90277

ORNL: KR-85
- 165 Technical Operations
South Avenue
Burlington, MA 01803

ORNL: GD-153, IR-192
- 166 Teledyne Isotopes
123 Woodland Avenue
Westwood, NJ 07675

BNL : SR-90, XE-127
ORNL: XE-127
- 167 Teledyne Isotopes
Nuclear Systems Division
110 W. Timonium Road
Timonium, MD 21093

ORNL: MCP, SR-90
- 168 Texas A&M Research Foundation
P.O. Box H
College Station, TX 77843

ORNL: CSI
- 169 Texas A&M University
P.O. Box 44
College Station, TX 77843

LANL: CU-67
- 170 Texas Instruments Incorporated
Semiconductor Group
P.O. Box 225012 MS 6
Dallas, TX 75265

ORNL: KR-85
- 171 Texas State College, North
Denton, TX 76203

ORNL: CSI
- 172 The Wisthir Institute
Thirty-sixth Street at Spruce
Philadelphia, PA 19104

BNL : I-123, IN-111
- 173 **Tracero** Corporation
5763 **Underwood** Road
Pasadena, TX 77507

ORNL: KR-85
- 174 Trio Tech International
2040 N. Lincoln Street
Burbank, CA 91504

ORNL: KR-85
- 175 U.S. Department of Agriculture
Grand Forks Human Nutrition
Research Center
Box 7166 University Station
Grand Forks, ND 58202

LANL: CU-67
- 176 U.S. Department of Agriculture
Research Service
P.O. Box 53326
New Orleans, LA 70150

ORNL: CSI

177 U.S. Department of Energy
376 Hudson Street, 5th Floor
New York, NY 10014

ORNL: CSI, PU-237

178 U.S. Department of Energy
New Brunswick Laboratory
9800 South Cass Avenue
Argonne, IL 60439

ORNL: SP

179 U.S. Geological Survey
National Center, Room 1447-A
12201 Sunrise Valley Drive
Reston, VA 22092

ORNL: SP, TH-230, U-233, U-236

180 U.S. National Bureau of
Standards
Rec. Room, Bldg. 301
Route 270, Quince Orchard Road
Gaithersburg, MD 20878

BNL : SR-82, XE-127
ORNL: CSI, MS, SR-90

181 U.S. National Institute
of Health
9000 Rockville Pike
Bethesda, MD 20205

LANL: Y-88
ORNL: CSI, MCP, SS, TH-229

182 U.S. Navy
National Naval Medical Center
Bethesda, MD 20014

ORNL: XE-127

183 U.S. Public Health Environment
Accounting Operations Office
Durham
Research Triangle Park, NC 27709

ORNL: CAP, PA-231

184 Unit Process Assemblies, Inc.
53-15 37th Avenue
Woodside, NY 11377

ORNL: SR-90

185 University Hospitals
of Cleveland
2074 Abington Road
Cleveland, OH 44106

ORNL: CSI

186 University for Medicine
and Dentistry
Building 16-R 1609
100 Bergen Street
Newark, NJ 07103

BNL : 1-123
LANL: CU-67

187 University of Alabama-
Birmingham
University Station
Birmingham, AL 35294

BNL : H-3

188 University of Arizona
Drachnen St. at Warren Avenue
Tucson, AZ 85724

BNL : P-32

- 189 University of California
Davis Medical Center
4301 X Street
Sacramento, CA 95817
- 190 University of California
Lawrence Berkeley Laboratory
Berkeley, CA 94720

BNL : SR-82, TE-118
LANL: GE-68, SR-82
- 191 University of California
P.O. Box CA
Irvine, CA 92716

ORNL: PU-241, TP
- 192 University of California
SAC SURGE III
4301 X Street
Sacramento, CA 95817

BNL : CU-67
- 193 **University** of California San Diego
Accounting Office (Q-027)
La Jolla, CA 92093

BNL : U-238
ORNL: MCP
- 194 **University** of Chicago
Physical **Science** Department
1525 E. Hyde Park Boulevard
Chicago, IL 60615

ORNL: CSI, SM-151
- 195 **University** of Chicago
Radiation Protection Service
HP11, Department 1034
5835 S. Cottage Grove Avenue
Chicago, IL 60637

LANL: GE-68
- 196 University of Connecticut
Physical Sciences Building
Central Warehouse
Storrs, CT 06268

BNL : MG-28
ORNL: MG-28
- 197 University of Florida
Gainesville, FL 32601

BNL : CU-67, MG-28
ORNL: CF-252, MCP, MG-28, TP
- 198 University of Iowa
Iowa City, IA 52240

ORNL: MCP
- 199 University of Iowa Hospital
Iowa City, IA 52242

ORNL: MCP
- 200 University of Kentucky
Medical School
800 Rose Street
Lexington, KY 40506

ORNL: H-3
- 201 University of Lowell
Research Foundation
450 Aiken Street
Lowell, MA 01854

ORNL: TP, U-233
- 202 University of Massachusetts
Nuclear Physics Group
Department of Physics & Astronomy
Amherst, MA 01003

ORNL: MCP

- 203 University of Michigan
N. University Building
Ann Arbor, MI 48104

ORNL: TH-232, TP
- 204 University of Minnesota
W-172 Boynton Health Services
410 Church Street
Minneapolis, MN 55455

ORNL: CSI
- 205 University of Minnesota Hospital
Harvard Street at East River Road
Minneapolis, MN 55455

LANL: CU-67
- 206 University of Missouri
Columbia, MO 65201

LANL: Y-88
ORNL: CSI
- 207 University of North Carolina
Chemistry Venable 045A
Chapel Hill, NC 27514

BNL : MG-28
ORNL: MG-28
- 208 University of Pennsylvania
3451 Walnut Street
Philadelphia, PA 19104

ORNL: MG-28
- 209 University of Pennsylvania
Cerebrovascular Research Center
36th Street & Hamilton Walk
Philadelphia, PA 19104

BNL: F-18, MG-28
- 210 University of Pittsburgh
Pittsburgh, PA 15213

ORNL: SP
- 211 University of Rhode Island
Graduate School of Oceanography
South Ferry Road
Narragansett, RI 02882

ORNL: TH-230, U-238
- 212 University of Rochester
Medical Center
575 Elmwood Avenue
Rochester, NY 14627

BNL: CD-109
- 213 University of Southern California
Accounts Payable
P.O. Box 77967
Los Angeles, CA 90089

ORNL: CSI
- 214 University of Tennessee Hospital
1924 Alcoa Highway
Knoxville, TN 37920

ORNL: GD-153
- 215 University of Texas
Cancer Center
6723 Bertner Avenue
Houston, TX 77030

LANL: BR-77
ORNL: CSI
- 216 University of Texas
Health Science Center
at San Antonio
Department of
Medicine/Gastroenterology
P.O. Box P
San Antonio, TX 78284-7878

ORNL: MCP

217 University of Texas at Dallas
P.O. Box 30365
Dallas, TX 75230

LANL: CU-67
ORNL: GD-153

218 University of Utah
Purchasing Department
Salt Lake City, UT 84112

LANL: BE-7
ORNL: CSI, PU-237, PU-242

219 University of Virginia
Radiation Safety Officer
RWMF, 124 11th Street, S.W.
Charlottesville, VA 22903

ORNL: XE-127

220 University of Washington
Seattle, WA 98195

LANL: GE-68
ORNL: CSI, TP

221 University of Wisconsin
750 University Avenue
Madison, WI 53706

BNL : SR-82
ORNL: CSI, H-3, MG-28

222 V. A. Hospital:
Nuclear Medicine
1400 V.F. W. Parkway
West Roxbury, MA 02132

BNL: XE-127

223 V. A. Hospital, Martinez
CALM-VA-(612)
P.O. Box 2974
Austin, TX 78769

ORNL: CSI

224 V. A. Hospital, Palo Alto
CALM-VA-4 (640)
P.O. Box 2974
Austin, TX 78769

ORNL: Y-90

225 Varian Instrument Division
Aerograph Operations
2700 Mitchell Drive
Walnut Creek, CA 94598

BNL : NI-63

226 Washington University
499 S. Euclid
St. Louis, MO 63110

LANL: GE-68, NA-22, Y-88

227 Washington University
Lindell and Skinker
St. Louis, MO 63130

ORNL: CSI

228 Wellman Thermal Systems
Corporation
No. 1 Progress Road
Shelbyville, IN 46176

ORNL: KR-85

229 West Virginia University
Physics Department
P.O. Box 6023
Morgantown, WV 26506

BNL : TH-232

230 Westinghouse Electric Co., Inc.
P.O. Box 284
Elmira, NY 14902

ORNL: CAP, U-234

231 Westinghouse Electric Corporation
Research and Development Center
Beulah Road, Churchill Borough
Pittsburgh, PA 15235

ORNL: AM-243, CF-252, PU-241,
TP, U-238

232 Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

BNL : PU-239
ORNL: KR-85, MS, TP

233 Westinghouse Idaho Nuclear
Company, Inc.
P.O. Box 4000
Idaho Falls, ID 83403

ORNL: SP

234 Westinghouse Materials
Company of Ohio
P.O. Box 39158
Cincinnati, OH 45239

ORNL: SP

235 Yale University
20 Ashmun Street
New Haven, CT 06520

BNL : H-3
ORNL: MCP, TP

236 Yankee Atomic Electric Company
1671 Worcester Road
Framingham, MA 01701

ORNL: CSI

237 Zilog
2601 - 11th Avenue North
Nampa, ID 83651

ORNL: KR-85

AUSTRALIA

238 Australian AEC Research
Establishment
Lucas Heights, NSW

ORNL: CAP, CM-248

239 Embassy of Australia
1601 Massachusetts Ave., N.W.
Washington, D.C. 20036

ORNL: PU-240, TP

AUSTRIA

240 International Atomic
Energy Agency
Wagramerstrassa 5
P.O. Box 100
A-1400 Vienna

ORNL: PU-242, SP

BELGIUM

241 Joint Research Centre
Central Bureau for
Nuclear Measurements
Steenweg op Retie
2400 Geel

ORNL: TP, U-238

242 Positron Tomography Center
Chemin du Cyclotron
B-1048 Louvain-la-Neuve

ORNL: CSI

243 Universite de Liege
Centre de Recherches du Cyclotron
Sart Tilman
B-4000 Liege 1

LANL: GE-68
ORNL: CSI

CANADA

- 244 Atomic Energy of Canada Ltd.
Chalk River Nuclear Laboratories
Chalk River, Ontario K0J 1J0

INEL: RSI
ORNL: SP

- 245 Atomic Energy of Canada, Ltd.
4004 Westbrook Mall
Vancouver, B.C. V6T 2A8

BNL : XE-127

- 246 Atomic Energy of Canada, Ltd.
Radiochemical Co.
413 March Road
P.O. Box 13500
Kanata, Ontario K2K 1X8

ORNL: CSI, GD-153, MCP, XE-127

- 247 Dr. Gati & Associates
Laboratories, Ltd.
14120 - 115 Avenue
Edmonton, Alberta

ORNL: H-3, KR-85, TC-99

- 248 McMaster University
Hamilton, Ontario

ORNL: H-3

- 249 TRIUMF
Safety Group
4004 Westbrook Mall
Vancouver, BC V6T-2A3

BNL : CO-60
LANL: GE-68
ORNL: CSI

- 250 University of British Columbia
Vancouver 8, British Columbia

ORNL: CSI, H-3, MG-28

FEDERAL REPUBLIC OF GERMANY

- 251 Forschungsanstalt Karlsruhe
Reaktorgelände
D-7514 Leopoldshafen

ORNL: CAP, NP-237

- 252 Gesellschaft für Strahlen-U.
Umweltforschung München
Post Oberschleibheim
Ingolstädter Landstr. 1
D-8042 Neuherberg

ORNL: SP

- 253 Gesellschaft für
Schwerionenforschung
Planckstrasse 1
D-6100 Darmstadt

ORNL: TP, U-235

- 254 Osram GmbH LOG/TRE
Postfach 90 06 20
8000 München 90

ORNL: KR-85

- 255 Kernforschungszentrum Karlsruhe
Postfach 3640
7500 Karlsruhe

ORNL: CAP, NP-237, SP, TH-229

FINLAND

- 256 Oriola Oy ProLab
SF-02101 Espoo

ORNL: CS-137

FRANCE

- 257 Centre d'Etudes Nucleaires
de Fontenay-Aux-Roses
92260 Fontenay-Aux-Roses

SRL : CF-252

258 Commissariat A L'Energie
Atomique
Office Des Rayonnements
Ionisants
Purchasing Department
B.P. 21
91190 Gif-Sur-Yvette

ORNL: CO-60, SP, TH-230, ZR-95

259 Compagnie Oris Industrie
B.P. 21
91190 Gif-Sur-Yvette

ORNL: 1-129, SP, TH-230

ISRAEL

260 Israel Atomic Energy Commission
Soreq Nuclear Research Centre
Radiopharmaceuticals Unit
Yayne 70600

ORNL: SS

ITALY

261 CNR Instituto Di Fisiologia
Clinica
Via Savi, 8
56100 Pisa

LANL: GE-68
ORNL: CSI

262 Instituto Nazionale de Fisica
Nucleare
Laboratori Nazionali de Legnaro
Via Romea n. 4
35030 Legnaro
Padova

ORNL: CF-252, TP

263 Padova, Universita Degli Studi di
Via F. Marzolo 8
Padova

ORNL: CF-252, TP

JAPAN

264 Japan Atomic Energy
Research Institute
Tokai Research Establishment
Tokai-Mura, Naka-Gun, Ibaraki-Ken

ORNL: CAP, NP-237

MALAYSIA

265 Advanced Micro Devices
Export SDN. BHD
Bayan Lepas Free Trade Zone
Penang

ORNL: KR-85

MEXICO

266 Honeywell, S. A. de C. V.
Apartado 1223, col Panamericana
C. P. 3
Chihuahua, Chih

ORNL: KR-85

NETHERLANDS

267 Netherlands Energy Research
Foundation
P.O. Box 80404
2508 GH The Hague

ORNL: TP, U-233

268 National Institute for Nuclear
& High Energy Physics
Section K, Postbus 41882
1009 DB Amsterdam

LANL: SI-32

PHILIPPINES

- 269 Zilog Philippines, Inc.
8460 Dr. A. Snatos Ave. Cor.
South Superhighway, Paranaque
Ketro Manila

ORNL: H-3, KR-85

SWITZERLAND

- 270 Natural History Museum
Department of Mineralogy
CH-4051 Basel

ORNL: H-3

UNITED KINGDOM

- 271 Amersham International, Ltd.
White Lion Road
Amersham
Buckinghamshire
HP7 9LL England

ORNL: CM-244, GD-153, H-3,
KR-85, PM-147, RW,
SM-151, SS, TC-99,
TP, ZR-95
SRL: CF-252

- 272 Brandhust Co., Ltd.
Wellington Road
High Wycombe, Bucks
HP12 3PS England

ORNL: H-3

- 273 Medical Research Council
M.R.C. Laboratories
Woodmansterne Road
Carshalton, Surrey, SM5 4EF
England

ORNL: CSX

- 274 Saunders Roe Developments, Ltd.
North Hyde Road
Hayes, Middlesex
England

ORNL: H-3

- 275 Semi-Conductor Devices, Ltd.
59-61 Wong Chuk Hang Road
Aberdeen, Hong Kong

ORNL: KR-85

- 276 Surelite Limited
Priors Court
Priors Haw Road
Weldon, Northants NN171J6
England

ORNL: H-3

- 277 UK Freight Forwarding Office
25 Broadway
New York, NY 10004

ORNL: U-236

3. LIST OF ISOTOPES PURCHASED CROSS-REFERENCED TO CUSTOMER NUMBERS

This section contains an index of alphabetically listed isotopes cross-referenced to customer numbers. This list provides a quick reference of the number of customers purchasing a particular isotope.

ISOTOPES PURCHASED CROSS-REFERENCED TO CUSTOMER NUMBERS

Aluminum-26	129
Americium-241	47 62 96 126 132 157
Americium-243	231
Astatine-211	115
Beryllium-7	96 97 218
Bromine-77	215
Bromine-82	96
Cadmium-109	45 111 212
Californium-249	84
Californium-252	12 56 61 84 197 231 258 263 264 272
Cerium-144	10 22 43 47 69 84 129
Cesium-137	22 25 45 54 68 86 129 257
Cobalt-60	4 25 61 62 83 86 119 129 249 259
Copper-67	7 20 30 75 81 96 169 175 186 189 192 197 205 217
Curium-244	84 101 132 162 272
Curium-248	238
Cyc. Serv. Irrad.	7 24 26 31 39 43 44 45 97 108 128 129 132 145 156 168 171 176 177 180 181 185 194 204 206 213 215 218 220 221 223 227 236 242 243 246 249 250 251 262
Encapsulation	84 96 126 132 183 230 238 252 256 265
Fluorine-18	162 209
Gadolinium-153	17 18 43 44 68 84 95 102 109 129 165 214 217 246 272
Germanium-68	31 40 41 128 133 190 195 220 226 243 249 262
Indium-111	I72
Iodine-123	108 162 172 186

Iodine-129	43	84	96	129	260									
Iodine-131	16	30	161	162										
Iridium-192	59	82	99	158	165									
Iron-55	84													
Krypton-85	1	3	5	6	8	34	36	43	50	51	52	53	57	
	60	63	64	66	67	69	70	72	73	74	77	79	84	
	85	90	91	93	94	106	107	109	110	113	114	116	117	
	124	127	135	136	139	142	143	151	153	154	155	159	164	
	170	173	174	228	232	237	247	255	266	267	269	272	275	
Magnesium-28	23	27	43	44	130	145	189	196	197	207	208	209	221	
	250													
Misc. Compounds	4	26	29	32	42	45	62	65	68	71	86	92	96	
	100	103	119	128	129	167	181	193	197	198	199	202	216	
	235	246												
Misc. Services	45	47	55	84	92	96	125	150	180	232				
Neptunium-237	13	47	129	132	144	252	256	265						
Nickel-63	225													
Phosphorus-33	43	129												
Plutonium-236	147	151												
Plutonium-237	177	218												
Plutonium-239	232													
Plutonium-240	239													
Plutonium-241	191	231												
Plutonium-242	129	131	218	240										
Promethium-147	15	45	80	84	92	129	272							
Protactinium-231	183													
Radioisotopes Withdrawn	43	84	272											
Reactor Serv. Ir	47	86	118	119	140	141	244							
Rubidium-83	96													
Ruthenium-103	19													

[illegible]

Uranium-238	10	13	14	28	62	96	131	144	146	193	211	231	241
Xenon-127	9	19	21	48	76	98	105	121	122	166	180	182	219
	222	245	246										
Yttrium-88	84	129	132	181	206	226							
Zirconium-95	22	147	259	272									

4. GEOGRAPHIC LOCATIONS OF RADIOISOTOPE CUSTOMERS

This section is an index showing geographic distribution of radioisotope customers. State names and foreign countries are listed alphabetically, along with the customer numbers of customers located within each state or country.

66-GRAPHIC LOCATIONS OF CUSTOMERS BY CUSTOMER NUMBER

DOMESTIC

Alabama

187

Arizona

63 107 114 117 188

California

5 20 28 29 38 52 57 58 61 62 72 74 76 80 82 a4 a5
86 90 92 93 110 112 116 124 134 140 142 144 154 155 160 164 174
189 190 191 192 193 213 225

Colorado

12 73 83 89 148

Connecticut

78 196 235

Delaware

42 79

District of Columbia

65

Florida

33 55 69 197

Georgia

1 3 9 66 103 104

Idaho

11 47 233 237

Illinois

10 54 125 178 194 195

Indiana

105 135 138 228

Iowa

198 199

Kentucky

200

Louisiana

59 158 176

Maine

53

Maryland

16 87 119 137 151 157 167 180 181 182

Massachusetts

6 18 26 36 40 41 43 71 100 101 102 143 165 201 202 222 236

Michigan

88 203

Minnesota

109 204 205

Missouri

15 98 133 206 226 227

New Hampshire

17

New Jersey

2 14 27 34 35 44 46 49 67 81 91 139 141 163 166 186

New Mexico

48 96 97 150

New York

7 19 24 30 70 75 95 106 111 115 120 123 126 145 152 156 161
162 177 184 212 230

North Carolina

22 39 121 122 183 207

North Dakota

175

Ohio

4 13 23 56 130 146 185 234

Oregon

94 131

Pennsylvania

60 77 149 159 172 208 209 210 231

Puerto Rico

136

Rhode Island

211

South Carolina
25 45

Tennessee
31 99 118 128 129 214

Texas
21 37 50 68 113 127 168 169 170 171 173 215 216 217 223 224

Utah
153 218

Virginia
32 64 179 219

Washington
51 132 147 220

West Virginia
229

Wisconsin
8 108 221

FOREIGN

Australia
238 239

Austria
240

Belgium
241 242 243

Canada
244 245 246 247 248 249 250

Federal Republic of Germany
251 252 253 254 255

Finland
256

France
257 258 259

Israel
260

Italy

261 262 263

Japan

264

Malaysia

265

Mexico

266

Netherlands

267 268

Philippines

269

Switzerland

270

United Kingdom

271 272 273 274 275 276 277

5. RADIOISOTOPE SALES AND TRANSFERS - FY 1986

This section summarizes the fiscal year 1986 radioisotope shipment activities of the DOE laboratory facilities listed in Section 1. **Isotopes** are **listed** alphabetically with their suppliers. Data on shipments, quantities (including **units** of measure), and dollar values of each isotope are listed under domestic, foreign and DOE categories. The value of the radioisotopes sold in fiscal year 1986 was \$10.4 million.

RADIOISOTOPE SALES AND TRANSFERS - FY 1986

Isotope	sup-	Domestic			Foreign			DOE			Total		
		Number of Ship.	Quantity	Unit	\$ Value	Number of Ship.	Quantity	Unit	\$ Value	Number of Ship.	Quantity	Unit	\$ Value
Aluminum-26	ANL	0	---	µCi	0	0	---	µCi	0	1	3.50	µCi	45250
Americium-241	BNL	2	100.03	mCi	0	0	---	mCi	0	2	100.03	mCi	0
Americium-241	ORNL	4	15.02	g	25156	0	---	g	0	2	1.50	g	27283
Americium-243	ORNL	1	7.70	mg	770	0	---	mg	0	1	7.70	mg	770
Astatine-211	BNL	2	6.00	mCi	0	0	---	mCi	0	2	6.00	mCi	0
Beryllium-7	LANL	1	4.00	mCi	180	0	---	mCi	0	11	531.80	mCi	6536
Bromine-77	LANL	1	13.00	mCi	243	0	---	mCi	0	0	---	mCi	0
Bromine-82	LANL	0	---	mCi	0	0	---	mCi	0	3	144.00	mCi	1500
CSI-BNL	ORNL	6	165.00		6780	0	---		0	1	50.00		1025
CSI-LANL	ORNL	42	6034.40		171973	5	120.00		10080	21	1417.00		96667
Cadmium-109	BNL	2	55.00	mCi	0	0	---	mCi	0	0	---	mCi	0
Cadmium-109	LANL	0	---	mCi	0	0	---	mCi	0	1	10.00	mCi	250
Californium-249	ORNL	1	1.00	µg	100	0	---	µg	0	0	---	µg	0
Californium-252	BNL	1	62.00	mCi	0	0	---	mCi	0	0	---	mCi	0
Californium-252	ORNL	6	155.50	µCi	295	2	1.00	µCi	35	0	---	µCi	0
Californium-252	SRP	0	---	mg	0	2	7.07	mg	81240	0	---	mg	0
Californium-252	SRP	10	25.33	mg	286333	1	16.42	mg	190020	0	---	mg	0
Cerium-144	ORNL	6	1262.00	mCi	9420	0	---	mCi	0	5	20.00	mCi	1167
Cesium-137	BNL	2	16.00	µCi	0	0	---	µCi	0	0	---	µCi	0
Cesium-137	ORNL	5	21175.00	Ci	2900	1	---	Ci	200	3	20.00	Ci	600
Cobalt-60	BNL	1	200.00	µCi	0	1	67.00	µCi	0	0	---	µCi	0
Cobalt-60	INEL	3	437641.00	Ci	218821	0	---	Ci	0	0	---	Ci	0
Cobalt-60	ORNL	12	257864.00	Ci	309547	0	---	Ci	0	1	---	Ci	200
Copper-67	BNL	3	13.00	mCi	0	0	---	mCi	0	0	---	mCi	0
Copper-67	LANL	22	1384.00	mCi	2147	0	---	mCi	0	18	1293.20	mCi	0
Curium-244	BNL	2	160.01	mCi	0	0	---	mCi	0	0	---	mCi	0
Curium-244	ORNL	2	10.00	mg	1125	3	600.00	mg	60000	0	---	mg	0
Curium-248	ORNL	0	---		0	1	1.00	µg	100	0	---	µg	0
Cyc.Serv.Irrad.	BNL	4	---		180	0	---		0	0	---		0
Encapsulation	ORNL	2	---		335583	0	---		265000	14	---		34593
Fluorine-18	BNL	2	35.00	mCi	0	0	---	mCi	0	0	---	mCi	0
Gadolinium-153	ORNL	116	519727.50	mCi	2430460	40	230403.00	mCi	1061450	3	1005.00	mCi	5000
Germanium-68	LANL	11	680.50	mCi	12103	3	60.00	mCi	3060	2	13.00	mCi	798
Indium-111	BNL	4	17.00	mCi	0	0	---	mCi	0	0	---	mCi	0
Iodine-123	BNL	2	5.00	mCi	0	0	---	mCi	0	0	---	mCi	0
Iodine-129	ORNL	5	3200.00	mg	19200	1	600.00	mg	3600	3	1050.00	mg	7500
Iodine-131	BNL	10	15.52	mCi	0	0	---	mCi	0	0	---	mCi	0

Isotope	Supplier	Domestic				Foreign				DOE				Total			
		Number of Ship.	Quantity	Unit	\$ Value	Number of Ship.	Quantity	Unit	\$ Value	Number of Ship.	Quantity	Unit	\$ Value	Number of Ship.	Quantity	Unit	\$ Value
Iridium-192	ORNL	146	592653.00	Ci	766785	0	---	Ci	0	7	771.00	Ci	1870	153	593424.00	Ci	768655
Iron-55	ORNL	1	1000.00	mCi	3750	0	---	mCi	0	0	---	mCi	0	1	1000.00	mCi	3750
Krypton-85	ORNL	179	5157.02	Ci	375867	12	450.00	Ci	32400	1	3.00	Ci	171	192	5610.02	Ci	408438
Krypton-85E	ORNL	1	20.00	Ci	3331	5	421.00	Ci	100513	0	---	Ci	0	6	441.00	Ci	103844
Magnesium-28	ORNL	38	67.05	mCi	51965	0	---	mCi	0	1	10.00	mCi	3764	39	77.05	mCi	55729
Hisc. Compounds	ORNL	8	21.00		4750	0	---		0	3	6.00		1751	11	27.00		6501
Misc. Isotopes	BNL	36	---		1950	5	---		8879	0	---		0	41	---		10829
Misc. Services	ORNL	0	---		2696	0	---		0	5	128.00		24032	5	128.00		26728
Neptunium-237H	ORNL	3	5.00	mg	428	3	203005.00	mg	108872	1	1212.00	mg	1772	7	204222.00	mg	111072
Neptunium-2370	ORNL	0	---	mg	0	1	1000.00	mg	5000	1	8000.00	mg	4000	2	9000.00	mg	9000
Nickel-63	BNL	1	8.00	mCi	0	0	---	mCi	0	0	---	mCi	0	1	8.00	mCi	0
Phosphorus-33	ORNL	4	806.00	mCi	24144	0	---	mCi	0	2	2.00	mCi	400	6	808.00	mCi	24544
Plutonium-236	ORNL	1	1.00	µCi	2000	0	---	µCi	0	1	---	µCi	4335	2	1.00	µCi	6335
Plutonium-237	ORNL	2	4.00	µCi	2690	0	---	µCi	0	1	---	µCi	1025	3	4.00	µCi	3715
Plutonium-239	BNL	1	1.00	µCi	0	0	---	µCi	0	0	---	µCi	0	1	1.00	µCi	0
Plutonium-240	ORNL	0	---	mg	0	1	300.00	mg	900	0	---	mg	0	1	300.00	mg	900
Plutonium-241	ORNL	2	108.50	mg	843	0	---	mg	0	0	---	mg	0	2	108.50	mg	843
Plutonium-242	ORNL	1	1.00	mg	15	1	1000.00	mg	15890	2	100.00	mg	2282	4	1101.00	mg	18187
Promethium-147	ORNL	2	35.00	Ci	400	1	14755.00	Ci	25000	4	190.39	Ci	1244	7	14980.39	Ci	26644
Protactinium-231	ORNL	0	---	mg	0	0	---	mg	0	1	1.00	mg	84	1	1.00	mg	84
Radioisotopes Wf	ORNL	4	187.00		5610	1	200.00		6000	0	---		0	5	387.00		11610
Reactor Serv. Ir	BNL	17	---		21564	0	---		0	0	---		0	17	---		21564
Reactor Serv. Ir	INEL	0	---		0	1	---		0	1	---		0	2	---		0
Reactor Serv. Ir	ORNL	6	441923005.10		338442	0	---		0	0	---		0	6	442262447.20		338442
Ruthenium-97	BNL	5	180.00	mCi	0	0	---	mCi	0	0	---	mCi	0	5	180.00	mCi	0
Ruthenium-103	ORNL	0	---	mCi	0	0	---	mCi	0	1	3.00	mCi	357	1	3.00	mCi	357
Ruthenium-106	ORNL	7	81.00	mCi	9800	0	---	mCi	0	1	---	mCi	200	8	81.00	mCi	10000
Samarium-151	ORNL	1	5.00	mg	200	1	1000.50	mg	445	1	1000.00	mg	297	3	2005.50	mg	942
Selenium-75	ORNL	18	9430.00	mCi	12460	0	---	mCi	0	1	---	mCi	200	19	9430.00	mCi	12660
Silicon-32	LANL	1	3.00	mCi	1696	1	0.05	mCi	0	2	0.01	mCi	0	4	3.06	mCi	1696
Sodium-22	LANL	3	1388.80	mCi	23370	0	---	mCi	0	0	---	mCi	0	3	1388.80	mCi	23370
Sodium-24	BNL	1	0.10	mCi	0	0	---	mCi	0	0	---	mCi	0	1	0.10	mCi	0
Special Processes	ORNL	0	---		2543	1	1.00		2323	0	---		4296	1	1.00		9162
Special Services	ORNL	26	2.50		86690	0	---		122943	7	219.00		60962	33	221.50		270595

Isotope	sup- plier	Domestic				Foreign				DOE				Total			
		Number of Ship.	Quantity	Unit	\$ Value	Number of Ship.	Quantity	Unit	\$ Value	Number of Ship.	Quantity	Unit	\$ Value	Number of	Quantity	Unit	\$ Value
Strontium-82	BNL	2	12.00	mCi	0	0	---	mCi	0	0	---	mCi	0	2	12.00	mCi	0
Strontium-82	LANL	5	2150.00	mCi	34900	0	---	mCi	0	2	400.00	mCi	6600	7	2550.00	mCi	41500
Strontium-89	ORNL	7	32.10	mCi	2400	0	---	mCi	0	1	10.00	mCi	1200	8	42.10	mCi	3600
Strontium-90	BNL	2	0.90	mCi	0	0	---	mCi	0	0	---	mCi	0	2	0.90	mCi	0
Strontium-90	ORNL	6	150600.11	Ci	15840	0	---	Ci	0	2	0.02	Ci	400	8	150600.13	Ci	16240
Target Prep.	ORNL	1	---		112750	0	---		9775	4	---		41200	5	---		163725
Technetium-99	ORNL	8	41005.00	mg	2541	5	20000.00	mg	20000.00		20000.00	mg	891	12	261005.00	mg	25832
Thorium-229	ORNL	0	---	µg	0	1	2.50	µg	62	1	---	µg	375	2	2.50	µg	437
Thorium-230	ORNL	3	16.00	mg	820	2	15.00	mg	348	2	12.00	mg	123	7	43.00	mg	1291
Thorium-232	BNL	1	6.00	µCi	0	0	---	µCi	0	0	---	µCi	0	1	6.00	µCi	0
Thorium-232	ORNL	3	3563064.00	mg	900	0	---	mg	0	1	200.00	mg	10	4	3563264.00	mg	910
Thulium-170	UNC	0	---	Ci	0	0	---	Ci	0	1	8.95	Ci	500	1	8.95	Ci	500
Titanium-44	LANL	0	---	mCi	0	0	---	mCi	0	1	2.00	mCi	17500	1	2.00	mCi	17500
Tritium	BNL	4	98.00	mCi	0	1	1.00	mCi	0	0	---	mCi	0	5	99.00	mCi	0
Tritium	ORNL	130	597614.00	Ci	660443	44	1128911.00	Ci	1242417	5	11034.00	Ci	9053	179	1737559.00	Ci	1911913
Uranium-233	ORNL	0	2628000.00	mg	0	1	200.00	mg	516	1	2.00	mg	5	2	2628202.00	mg	521
Uranium-234	ORNL	2	700.00	mg	30100	0	---	mg	0	0	---	mg	0	2	700.00	mg	30100
Uranium-235	BNL	7	60.04	mCi	0	3	4205.00	mCi	0	0	---	mCi	0	10	4265.04	mCi	0
Uranium-235	ORNL	9	356390.00	mg	18278	2	11000.00	mg	1540	2	600.00	mg	309	13	367990.00	mg	20127
Uranium-236	ORNL	1	175.00	mg	78	1	100.00	mg	45	1	50.00	mg	22	3	325.00	mg	145
Uranium-238	BNL	6	0.39	mCi	0	0	---	mCi	0	0	---	mCi	0	6	0.39	mCi	0
Uranium-238	ORNL	7	165401.00	mg	3915	1	20000.00	mg	2000	0	---	mg	0	8	185401.00	mg	5915
Xenon-127	BNL	2	23.92	mCi	0	0	---	mCi	0	0	---	mCi	0	2	23.92	mCi	0
Xenon-127	LANL	0	---	mCi	0	0	---	mCi	0	3	16860.00	mCi	12964	3	16860.00	mCi	12964
Xenon-127	ORNL	33	32180.00	mCi	118422	6	2393.00	mCi	9772	8	925.00	mCi	4240	47	35498.00	mCi	132434
Yttrium-88	LANL	8	158.10	mCi	2025	0	---	mCi	0	2	1.01	mCi	250	10	159.11	mCi	2275
Zirconium-95	ORNL	1	3.00	mCi	200	4	33.00	mCi	1010	2	20.00	mCi	800	7	56.00	mCi	2010
TOTAL		1056			6580917	163			3383835	173			412697	1392			10377449

Notes: All isotopes shipped from LANL (CSI-L) and BNL (CSI-B) are billed from ORNL and included in Cyclotron Service Irradiations.
 All isotopes from BNL without dollar amounts are produced by chemical separation.
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Publishing Coordination (2)