LIST OF DOE RADIOISOTOPE CUSTOMERS
WITH SUMMARY OF RADIOISOTOPE SHIPMENTS
FY 1978

Compiled by
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R. I. Laidler

May 1979

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Pacific Northwest Laboratory
Richland, Washington 99352

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Authorizing Official

Date: *06/13/2007*

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Brookhaven National Laboratory
Hanford Engineering Development Laboratory
Idaho Operations Office/Aerojet Nuclear Company
Los Alamos Scientific Laboratory
Mound Facility
Pacific Northwest Laboratory
Savannah River Plant/DOE
UNC Nuclear Industries, Inc.

PREVIOUS REPORTS

Previous reports in this series are:

TID-2160 (FY 1964)	ORNL-IIC-17 (FY 1968)	BNWL-1774 (FY 1972)
ORNL-IIC-6 (FY 1965)	ORNL-IIC-27 (FY 1969)	BNWL-1824 (FY 1973)
ORNL-IIC-9 (FY 1966)	ORNL-IIC-32 (FY 1970)	BNWL-1902 (FY 1974)
ORNL-IIC-13 (FY 1967)	ORNL-IIC-38 (FY 1971)	BNWL-1993 (FY 1975)
		BNWL-2147 (FY 1976)
		BNL-2572 (FY 1977)

Similar reports covering stable isotope distribution 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 Customer List and Summary of Shipments, FY 1977," Oak Ridge National Laboratory, ORNL/TM-6241, April 1978 (\$4.50 printed; \$3.00 microfiche).
- "Stable Isotope Sales: Mound Facility Customer and Shipment Summaries, FY 1978." MLM-2594, March 16, 1979 (\$4.00 printed; \$3.00 microfiche).
- "Stable Isotope Sales: Mound Facility Customer and Shipment Summaries, FY 1977." MLM-2504, April 27, 1978 (\$4.00 printed; \$3.00 microfiche).
- "Stable Isotope Sales: Mound Facility Customer and Shipment Summaries, FY 1976 and 1976 A." MLM-2403, June 6, 1977 (\$4.00 printed; \$3.00 microfiche).
- "Stable Isotope Sales: Mound Facility Customer and Shipment Summaries, FY 1975." MLM-2295, April 30, 1976 (\$4.00 printed; \$3.00 microfiche).

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NOMENCLATURE

I. CLASSIFICATIONS

Cyclotron Service Irradiations	CSI	Natural Uranium	NU
Depleted Uranium	DU	Reactor Service Irradiations	RSI
Encapsulation	Cap	Withdrawn radioisotopes prepared under special approval	RW
Enriched Uranium	EU	Special Services	SS
Fission Products	FP	Targets	Tgs
Miscellaneous Compound Preparations	MCP		

11. ISOTOPE SUPPLIER AND CONTACT

Argonne National Laboratory	(A)		
J. C. Haugen Special Materials Division Argonne National Laboratory 9700 S. Cass Ave Argonne, IL 60439		Hanford Engineering Development Laboratory	(H)
FTS 972-6778 Commercial 312-972-6778		D. Engel, Manager Materials Management Richland, WA 99352	
		FTS 444-3548 Commercial 509-942-3548	
Battelle, Pacific Northwest Laboratories ^(a)	(P)	Idaho Operations Office	(I)
J. V. Filsinger Safety and Nuclear Materials Management Pacific Northwest Laboratory Richland, WA 99352		R. E. Simonds, Director Idaho National Engineering Co. EG&G Idaho, Inc. PO Box 1625 Idaho Falls, ID 83401	
FTS 444-2051 Commercial 509-946-2051		FTS 583-4266 Commercial 208-526-4266 Extension 4266	
Brookhaven National Laboratory	(B)	Los Alamos Scientific Laboratory	(L)
P. Colsman Isotopes and Special Materials Group Brookhaven National Laboratory		C. Longmire Los Alamos Scientific Laboratory University of California PO Box 1663 Los Alamos, NM 87545	
FTS 664-4058 Commercial 516-345-3441 Extension 4058		FTS 843-4948 Commercial 505-667-4948	

(a) Battelle Memorial Institute operates Pacific Northwest Laboratory for the Department of Energy. In this report, we have identified Pacific Northwest Laboratory as Battelle, Pacific Northwest Laboratories.

NOMENCLATURE (contd.)

Mound Facility

(M)

R. DeWitt
Sales/Marketing Manager
Stable Isotope Sales
Monsanto Research Corporation
P.O. Box 32
Miamisburg, OH 45342

FTS 774-3896
Commercial 513-865-3896
Extension 7147

Oak Ridge National Laboratory

(O)

J. E. Ratledge, Supervisor
Isotope Sales
Oak Ridge National Laboratory
P.O. BOX X
Oak Ridge, TN 37830

FTS 624-6984
Commercial 615-574-6984
Extension 6661

Savannah River Plant

(S)

M. J. Sires, Acting Director
Technical and Production Division
Department of Energy
P.O. Box A
Aiken, SC 29801

FTS 239-2217
Commercial 803-725-6211
Extension 2217

UNC Nuclear Industries, Inc.

(U)

P. A. Carlson, Manager
Reactor Technology
Richland, WA 99352

FTS 444-1631
Commercial 509-942-1631

LIST OF DOE RADIOISOTOPE CUSTOMERS
WITH SUMMARY OF RADIOISOTOPE SHIPMENTS

FY 1978

INTRODUCTION

The fourteenth edition of the radioisotope customer list was prepared at the request of the Division of Financial Services, Office of the Assistant Secretary for Environment, Department of Energy (DOE). The purpose of the document is to list DOE's radioisotopes production and distribution activities by its facilities at Argonne National Laboratory; Pacific Northwest Laboratory; Brookhaven National Laboratory; Hanford Engineering Development Laboratory; Idaho Operations Office; Los Alamos Scientific Laboratory; Mound Facility; Oak Ridge National Laboratory; Savannah River Laboratory; and UNC Nuclear Industries, Inc.

The information is divided into four sections. Section I is an alphabetical list of domestic and foreign customers and their addresses. Each customer has been assigned a number according to its alphabetical position to provide a means of cross-referencing in the following sections. The isotopes purchased are listed after the address of the customer, and the laboratory supplying each isotope is indicated by a letter set off by parentheses (see page vi, Nomenclature, Part II).^(a) Section II is an alphabetical list of isotopes that are cross-referenced to customer numbers and divided into the domestic and foreign categories. This section provides a quick idea of the number of companies purchasing a particular isotope. If more information is needed, the reader can locate the customer by number and determine the laboratory supplying the isotope. Section III is an alphabetical list of states and is also cross-referenced to customer numbers, indicating geographical concentrations of isotope users. Section IV summarizes the FY-1978 radioisotope shipment activities of laboratories in a comprehensive table providing an alphabetical listing of the isotopes and their suppliers. The shipments, quantities, and dollars are broken down for each isotope under the domestic, foreign, and project (DOE facilities) categories, and the total figures for each isotope are also provided.

(a) All entries for Argonne, UNC, and Idaho are either reactor service irradiations, cyclotrons service irradiations, or both with no processed isotopes being sold; entries for Savannah River represent material for resale and loans.

I. ALPHABETICAL LIST OF CUSTOMERS, WITH
CONTACTS AND ISOTOPES PURCHASED

A. DOMESTIC

<p>1 Aerojet Nuclear Company
550 Second Street
P.O. Box 1845
Idaho Falls, Idaho 83401
$^{252}\text{Cf}(0)$, $^{85}\text{Kr}(0)$, $^{236}\text{Pu}(0)$, $\text{SS}(0)$,
$\text{Tgs}(0)$, $^{133}\text{Xe}(0)$, $^{95}\text{Zr}(0)$</p> <p>2 Aerojet Ordnance Manufacturing Co.
3097 E. Ana Street
Compton, California 90221

DU(P)</p> <p>Air Force Academy,
see United States Air Force Academy</p> <p>3 Airco, Inc.
Central Research Laboratories
Murray Hill, New Jersey 07974
$^{85}\text{Kr}(0)$, $^{133}\text{Xe}(0)$</p> <p>Alabama, University of,
see University of Alabama</p> <p>4 Albert Einstein College of Medicine
Ullman Building, Room 121
1300 Morris Park Avenue
Bronx, New York 10461
$^{81}\text{Kr}(B)$</p> <p>5 Allen-Bradley Company
136 W. Greenfield Avenue
Milwaukee, Wisconsin 53204
$^{85}\text{Kr}(0)$</p> <p>6 Allied Chemical Corporation
Idaho Chemical Programs - Operations
Office
550 2nd Street
Idaho Falls, Idaho 83401
$^{198}\text{Au}(I)$, $^{60}\text{Co}(I)$</p> | <p>7 American Atomics Corporation
425 S. Plumer Avenue
Tucson, Arizona 85719

$^3\text{H}(0)$, $^{85}\text{Kr}(0)$, $^{238}\text{U}(M)$</p> <p>8 Amersham Corporation
2636 S. Clearbrook Drive
Arlington Heights, Illinois 60005
$^{241}\text{Am}(0)$, $\text{Cap}(0)$, $^{109}\text{Cd}(B)$, $\text{CSI}(0)$,
$^3\text{H}(0)$, $^{129}\text{I}(0)$, $^{106}\text{Ru}(0)$, $\text{Tgs}(0)$</p> <p>9 AMOCO Oil Company
Research and Development
P.O. Box 400
Naperville, Illinois 60540

RSI(A)</p> <p>10 ARCO Nuclear Company
P.O. Box 546
Leechburg, Pennsylvania 15656
$^{238}\text{Pu}(0)$</p> <p>11 Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439
$^{249}\text{Bk}(0)$, $^{252}\text{Cf}(S)$, $^{248}\text{Cm}(0)$, $\text{DU}(P)$,
$^{253}\text{Es}(0)$, $^{257}\text{Fm}(0)$, $^{95}\text{Nb}(0)$, $\text{Np}(P)$,
$^{237}\text{Np}(0)$, $^{236}\text{Pu}(0)$, $^{242}\text{Pu}(0)$, $^{106}\text{Ru}(0)$,
$^{99}\text{Tc}(0)$, $\text{Tgs}(0)$, $^{230}\text{Th}(0)$, $^{232}\text{Th}(0)$,
$^{233}\text{U}(0)$, $^{235}\text{U}(0)$, $^{238}\text{U}(0)$, $^{91}\text{Y}(0)$,
$^{95}\text{Zr}(0)$</p> <p>12 Argonne National Laboratory
P.O. Box 2528
Idaho Falls, Idaho 83401
$^{128}\text{Xe}(\text{stable})(I)$</p> <p>13 Argonne National Laboratory
Scoville, Idaho 83401
$^{58}\text{Co}(H)$, $^{55}\text{Fe}(H)$, $^{54}\text{Mn}(H)$, $^{56}\text{Mn}(H)$,
$^{182}\text{Ta}(H)$</p> |
|---|---|

* All starred isotopes are Oak Ridge billed.

- 14 Arizona State University
Tempe, Arizona 85281
 $^{252}\text{Cf}(\text{O})$, $\text{Tgs}(\text{O})$

Arizona, University of,
see University of Arizona

Arkansas, University of,
see University of Arkansas

Army, see United States Army
- 15 Atomic International
8900 DeSota Avenue
Canoga Park, California 91304
 $^{58}\text{Co}(\text{H})$, $^{56}\text{Mn}(\text{H})$, $^{182}\text{Ta}(\text{H})$
- 16 Automation Industries, Inc.
P.O. Box 245
Phoenixville, Pennsylvania 19460
 $^{192}\text{Ir}(\text{O})$, $\text{RW}(\text{O})$
- 17 Babcock and Wilcox Company
Research and Development Division
1562 Beeson Street
Alliance, Ohio 44601
 $^{237}\text{Np}(\text{O})$, $^{244}\text{Pu}(\text{O})$, $\text{Tgs}(\text{O})$, $^{233}\text{U}(\text{O})$,
 $^{238}\text{U}(\text{O})$

Baker Chemical Company, J. T., see
J. T. Baker Chemical Company
- 18 Battelle Memorial Institute
505 King Avenue
Columbus, Ohio 43201
 $^{252}\text{Cf}(\text{O})$, $\text{NU}(\text{P})$, $^{236}\text{Pu}(\text{O})$, $\text{SS}(\text{O})$,
 $^{232}\text{U}(\text{O})$
- 19 Battelle, Pacific Northwest Laboratories,
P.O. Box 999
Richland, Washington 99352
 $^{241}\text{Am}(\text{H})$, $^{133}\text{Ba}(\text{H})$, $^{249}\text{Bk}(\text{O})$, $\text{Cap}(\text{O})$,
 $^{144}\text{Ce}(\text{O})$, $^{137}\text{Cs}(\text{H})$, $\text{CSl}(\text{O})$, $^{253}\text{Es}(\text{O})$,
 $^{152}\text{Eu}(\text{H})$, $^3\text{H}(\text{O})$, $^{85}\text{Kr}(\text{O})$, $^{95}\text{Nb}(\text{O})$,
 $^{231}\text{Pa}(\text{O})$, $^{147}\text{Pm}(\text{H})$, $^{238}\text{Pu}(\text{H})$, $^{239}\text{Pu}(\text{H})$,
 $^{236}\text{Pu}(\text{O})$, $^{244}\text{Pu}(\text{O})$, $\text{RaDEF}(\text{H})$, $\text{SS}(\text{O})$,
 $^{90}\text{SrY}(\text{H})$, $^{99}\text{Tc}(\text{O})$, $\text{Tgs}(\text{O})$, $^{170}\text{Tm}(\text{U})$,
 $\text{U}(\text{natural})(\text{H})$, $^{95}\text{Zr}(\text{O})$
- 20 Bell Telephone Laboratories
Murray Hill, New Jersey 07971

 $\text{MCP}(\text{O})$, $\text{SS}(\text{O})$
- 21 Brookhaven National Laboratory
Upton, Long Island, New York 11973
 $^{241}\text{Am}(\text{O})$, $^{252}\text{Cf}(\text{O})$, $^{252}\text{Cf}(\text{S})$, $^3\text{H}(\text{O})$,
 $^{238}\text{Pu}(\text{O})$, $^{244}\text{Pu}(\text{O})$, $^{103}\text{Ru}(\text{O})$, $\text{Tgs}(\text{O})$,
 $^{232}\text{Th}(\text{O})$
- 22 Brown University
Providence, Rhode Island 02912
 $^{28}\text{Mg}(\text{B})^*$, $^{91}\text{Y}(\text{O})$
- 23 Burroughs Corporation
460 Sierra Madra Villa
Pasadena, California 91109
 $^{85}\text{Kr}(\text{O})$
- 24 Burroughs Corporation
16701 W. Bernardo Drive
San Diego, California 92127
 $^{85}\text{Kr}(\text{O})$
- 25 California Institute of Technology
1201 E. California Boulevard
Pasadena, California 91109
 $^{235}\text{U}(\text{O})$

- California, University of,
see University of California
- 26 Case-Western Reserve University
2232 Circle Drive
Cleveland, Ohio 44106
 $^3\text{H}(0)$, $^{28}\text{Mg}(8)^*$, $\text{Tgs}(0)$
- 27 Charlotte Memorial Hospital
Nuclear Medicine
1000 Blythe Boulevard
Charlotte, North Carolina 28234
 $^{127}\text{Xe}(B)^*$
- Chicago, University of,
see University of Chicago
- 28 Children's Hospital
Radiopharmacy
300 Longwood Avenue
Boston, Massachusetts 02115
 $^{81}\text{Rb}(B)$
- 29 Cincinnati General Hospital - FDA
Nuclear Medicine Laboratory
234 Goodman Street
Cincinnati, Ohio 45267
 $^{52}\text{Fe}(8)$
- 30 Colorado State University
Fort Collins, Colorado 80521
 $^{85}\text{Kr}(0)$
- 31 Columbia University
Black Building
168th and Ft. Washington Avenue
New York, New York 10032
 $^{81}\text{Kr}(8)$
- Connecticut, University of,
see University of Connecticut
- 32 Continental Oil Company
Research and Development Department
P.O. Box 1267
Ponca City, Oklahoma 74601
 $^{89}\text{Sr}(0)$
- 33 Cook Electric Company
6201 Oakton Street
Morton Grove, Illinois 60053
 $^{85}\text{Kr}(0)$
- 34 Cooper Medical Center
Division of Nuclear Medicine
6th and Stevens Street
Camden, New Jersey 08103
 $^{127}\text{Xe}(8)^*$
- 35 Cornell University
Division of Nutritional Sciences
M.V.R. Hall
Ithaca, New York 14853
 $^{47}\text{Ca}(0)$, $^{127}\text{Xe}(B)^*$
- 36 Creighton University
2410 California
Omaha, Nebraska 68131
 $^{47}\text{Ca}(0)$
- 37 Cryogenic Rare Gas Laboratories, Inc.
730 S. 13th Street
Newark, New Jersey 07103
 $^{85}\text{Kr}(0)$
- 38 Cyclotron Corporation
950 Gilman Street
Berkeley, California 94710
 $^3\text{H}(0)$
- 39 DCA Reliability Laboratory
975 Benicia Avenue
Sunnyvale, California 94086
 $^{85}\text{Kr}(0)$
- 40 Delco Electronics
General Motors Corporation
Kokomo, Indiana 46901
 $^{85}\text{Kr}(0)$
- 41 Department of Energy - Idaho
Health Services Laboratory
550 2nd Street
Idaho Falls, Idaho 83401
 $^{147}\text{Nd}(I)$

- 42 Department of Energy
9800 Cass Avenue
Argonne, Illinois 60439

Pu(P)
- 43 Department of Interior
Geological Survey
National Center
12201 Sunrise Valley Drive
Reston, Virginia 22092

 $^{252}\text{Cf}(\text{S})$
- 44 Department of Law Enforcement
Bureau of Identification
Joliet, Illinois 60432

RSI(A)
- 45 Diagnostic Isotopes
225 Belleville Avenue
Bloomfield, New Jersey 07003

 $^{127}\text{Xe}(\text{B})^*$
- 46 Duke University
Durham, North Carolina 27706

 $^{252}\text{Cf}(\text{O})$, Tgs(O), $^{133}\text{Xe}(\text{O})$

du Pont,
see E. I. du Pont de Nemours and Company
- 47 Eberline Instrument Corporation
P.O. Box 279
Santa Fe, New Mexico 87501

 $^{250}\text{Cf}(\text{O})$, $^{236}\text{Pu}(\text{O})$, SS(O)
- 48 Edgerton, Germeshausen and Grier
P.O. Box 98
Goleta, California 93017

MCP(O)
- 49 Edinboro State College
Edinboro, Pennsylvania 16444

 $^{252}\text{Cf}(\text{S})$
- 50 Edsel B. Ford Institute for Medical
Research
Department of Physics and Biophysics
Henry Ford Hospital
2799 West Grand Boulevard
Detroit, Michigan 48202

 $^{252}\text{Cf}(\text{S})$
- 51 EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, Idaho 83401

 $^{108}\text{Ag}(\text{I})$, $^{110}\text{Ag}(\text{I})$, $^{28}\text{Al}(\text{I})$, $^{198}\text{Au}(\text{I})$,
 $^{80}\text{Br}(\text{I})$, $^{82}\text{Br}(\text{I})$, $^{47}\text{Ca}(\text{I})$, $^{49}\text{Ca}(\text{I})$,
 $^{117}\text{Cd}(\text{I})$, $^{143}\text{Ce}(\text{I})$, $^{51}\text{Cr}(\text{I})$, $^{53}\text{Cr}(\text{I})$,
EU(P), $^{59}\text{Fe}(\text{I})$, $^{42}\text{K}(\text{I})$, $^{140}\text{La}(\text{I})$, $^{56}\text{Mn}(\text{I})$,
 $^{99}\text{Mo}(\text{I})$, $^{24}\text{Na}(\text{I})$, Nd(I), $^{149}\text{Nd}(\text{I})$,
 $^{151}\text{Nd}(\text{I})$, $^{142}\text{Pr}(\text{I})$, $^{122}\text{Sb}(\text{I})$, $^{124}\text{Sb}(\text{I})$,
 $^{77}\text{Se}(\text{I})$, $^{79}\text{Se}(\text{I})$, $^{81}\text{Se}(\text{I})$, $^{153}\text{Sm}(\text{I})$
- 52 E. I. DuPont de Nemours & Co.
Savannah River Plant
Aiken, South Carolina 29801

 $^{252}\text{Cf}(\text{O})$, $^{248}\text{Cm}(\text{O})$, $^{137}\text{Cs}(\text{O})$, $^{239}\text{M}(\text{O})$,
MCP(O), $^{238}\text{Pu}(\text{M})$, $^{236}\text{Pu}(\text{O})$, $^{242}\text{Pu}(\text{O})$,
 $^{244}\text{Pu}(\text{O})$, SS(O), Tgs(O), $^{233}\text{U}(\text{O})$
- 53 Electronic Test Center
2200 Walsh Avenue
Santa Clara, California 95050

 $^{85}\text{Kr}(\text{O})$
- 54 Exxon Nuclear Co., Inc.
2101 Horn Rapids Road
Richland, Washington 99352

DU(P), EU(P)
- 55 Fairchild Semiconductor
P.O. Box 790
Mountain View, California 94040

 $^{85}\text{Kr}(\text{O})$
- 56 Fairchild Semiconductor
333 Western Avenue
So. Portland, Maine 04106

 $^{85}\text{Kr}(\text{O})$
- 57 Florida State University
Tallahassee, Florida 32306

 $^{252}\text{Cf}(\text{O})$
- 58 Ford Aerospace and Communication Corporation
Division of Ford Motor
3939 Fabian Way
Palo Alto, California 94303

 $^{85}\text{Kr}(\text{O})$

- 59 Gamma Industries
9320 Travenor
P.O. Box 34526
Houston, Texas 77034
 $^{137}\text{Cs}(0)$, $\text{SS}(0)$
- 60 Gamma Industries, Inc.
P.O. Box 2543
Baton Rouge, Louisiana 70821
 $^{192}\text{Ir}(0)$, $\text{RW}(0)$
- 61 Gammie Nuclear Company
11941 Waveland Avenue
Franklin Park, Illinois 60131
 $\text{RSI}(A)$
- 62 Gatan, Inc.
3117 Babcock Boulevard
Pittsburgh, Pennsylvania 15237
 $^{58}\text{Co}(H)$, $^{54}\text{Mn}(H)$
- 63 General Electric Company
P.O. Box 254
San Jose, California 95103
 $^{241}\text{Am}(0)$, $\text{Cap}(0)$, $^{137}\text{Cs}(0)$, $\text{MCP}(0)$,
 $\text{Tgs}(0)$, $^{234}\text{U}(0)$, $^{235}\text{U}(0)$
- 64 General Electric Company
Neutron Devices Department
Pinellas Peninsula Plant
St. Petersburg, Florida 33733
 $^{238}\text{Pu}(M)$
- 65 General Electric Company
Vallecitos Nuclear Center
Pleasanton, California 94566
 $^{58}\text{Co}(H)$, $^{56}\text{Mn}(H)$, $^{122}\text{Sb}(I)$, $^{124}\text{Sb}(I)$
- 66 General Electric Company
General Electric Drive
Waynesboro, Virginia 22980
 $^{85}\text{Kr}(0)$

Geological Survey,
see United States Geological Survey
- 67 Georgia Institute of Technology
225 North Avenue, N.W.
Atlanta, Georgia 30332
 $\text{MCP}(0)$, $^{90}\text{Sr}(0)$
- 68 George Washington University
23rd and Eye St. NW
Washington, O. C. 20037
 $^{77}\text{Br}(L)$
- 69 Gollob Analytical Service Corporation
47 Industrial Road
Berkely Heights, New Jersey 07922
 $^3\text{H}(0)$
- 70 Goodyear Atomic Corp.
P.O. Box 628
Piketon, Ohio 45661
 $\text{EU}(P)$, $^{237}\text{Np}(0)$, $^{99}\text{Tc}(0)$
- 71 Gulf Energy and Environmental Systems
P.O. Box 608
San Diego, California 92112
 $^{140}\text{Ba}(0)$, $^{236}\text{Pu}(0)$, $^{103}\text{Ru}(0)$, $^{95}\text{Zr}(0)$
- 72 Harry F. Truman Memorial Veterans Hospital
Chief Supply Service
800 Stadium Road
Columbia, Missouri 65201
 $^{127}\text{Xe}(B)^*$
- 73 Harvard Medical School
Department of Radiology
50 Binney Street
Boston, Massachusetts 02115
 $^{211}\text{At}(B)$
- 74 Herbert Lehman College of the
City University of New York
Bedford Park Boulevard West
Bronx, New York 10468
 $^{151}\text{Sm}(0)$
- 75 Holy Family Hospital
N. 5633 Lidgerwood Street
Spokane, Washington 99207
 $^{133}\text{Xe}(0)$

- 76 Honeywell, Inc.
Bldg. 502 Mail Station MN 30
2540/Twin City
New Brighton, Minnesota 55112

DU(P)
- 77 Honeywell, Inc.,
600 Second St., N.E.
Hopkins, Minnesota 55343

DU(P)
- 78 Hughes Aircraft Company
P.O. Box 92907
Los Angeles, California 90009

 $^{85}\text{Kr}(0)$
- 79 ICN-NB Co
26201 Miles Road
Cleveland, Ohio 44128

 $\text{CSI}(0)$, $^3\text{H}(0)$, $^{129}\text{I}(0)$, $^{33}\text{P}(0)$,
 $^{106}\text{Ru}(0)$, $^{90}\text{Sr}(0)$
- 80 INTEL Corporation
3065 Bowers Avenue
Santa Clara, California 95051

 $^{85}\text{Kr}(0)$
- 81 Indiana University
630 W. New York Street
Indianapolis, Indiana 46202

 $^{47}\text{Ca}(0)$
- 82 Industrial Nuclear Company
1124 Chess Drive
Foster City, California 94404

 $^{192}\text{Ir}(0)$, $\text{RW}(0)$
- 83 Intelcom Rad Tech
P.O. Box 80817
San Diego, California 92138

 $^{239}\text{Pu}(0)$, $\text{Tgs}(0)$
- 84 Interex Corporation
66 Woerd Avenue
Waltham, Massachusetts 02154

 $^{85}\text{Kr}(0)$
- 85 International Nutronics, Inc.
1237 N. San Antonio Rd.
Palo Alto, California 94303

 $^{252}\text{Cf}(S)$
- 86 Iowa State University
Ames, Iowa 50010

 $^{252}\text{Cf}(0)$, $^{129}\text{I}(0)$, $\text{MCP}(0)$, $\text{SS}(0)$
- 87 Iowa State University
Ames Laboratory
Ames, Iowa 50011

 $\text{RSI}(A)$
- 88 Isotope Products Laboratories
404 South Luke Street
Burbank, California 91502

 $^{241}\text{Am}(0)$, $^{109}\text{Cd}(B)^*$, $^{252}\text{Cf}(0)$, $^{244}\text{Cm}(0)$,
 $^{137}\text{Cs}(0)$, $\text{CSI}(0)$, $^{85}\text{Kr}(0)$, $^{237}\text{Np}(0)$,
 $^{147}\text{Pm}(0)$, $^{238}\text{Pu}(0)$, $^{240}\text{Pu}(0)$, $^{106}\text{Ru}(0)$,
 $^{90}\text{Sr}(0)$, $\text{Tgs}(0)$, $^{127}\text{Xe}(B)^*$, $^{91}\text{Y}(0)$,
 $^{95}\text{Zr}(0)$
- 89 Isovac Engineering Company
6220 San Fernando Road
Glendale, California 91204

 $^{85}\text{Kr}(0)$
- 90 J. T. Baker Chemical Company
Research Oepartment
600 N. Broad Street
Phillipsburg, New Jersey 08865

 $\text{RSI}(A)$
- 91 Jersey Nuclear-Avco Isotopes
c/o Exxon Nuclear Company, Inc.
2955 George Washington Way
Richland, Washington 99352

 $\text{Tgs}(0)$, $^{235}\text{U}(0)$
- 92 Jewish Hospital of St. Louis, The
216 S. Kings Highway Boulevard
St. Louis, Missouri 63110

 $^{47}\text{Ca}(0)$

- 93 John Hopkins Hospital
Radiation Safety
650 N. Wolfe Street
Baltimore, Maryland 21205
 $^{47}\text{Ca}(0)$, $^{81}\text{Kr}(B)$, $^{127}\text{Xe}(B)^*$
- 94 Joint Center for Graduate Study
100 Sprout Road
Richland, Washington 99352
 $^{54}\text{Mn}(H)$, $^{24}\text{Na}(H)$
- 95 KOR Isotopes
56 Rogers Street
Cambridge, Massachusetts 02141
 $^3\text{H}(0)$
- 96 Kaman Nuclear
1700 Garden of the Gods Road
Colorado Springs, Colorado 80907
 $^3\text{H}(0)$, $\text{Tgs}(0)$
- 97 Knolls Atomic Power Laboratory
P.O. Box 1072
Schenectady, New York 12301
 $^{243}\text{Am}(0)$, $^{236}\text{Pu}(0)$
- Kansas, University of,
see University of Kansas
Medical Center
- Kentucky, University of,
see University of Kentucky
- 98 Lehigh University
Department of Chemistry
Bethlehem, Pennsylvania 18015
 $^{252}\text{Cf}(S)$
- 99 Lenoir-Rhyne College
Hickory, North Carolina 38601
 $^{252}\text{Cf}(S)$
- 100 Los Alamos Scientific Laboratory
P.O. Box 1663
Los Alamos, New Mexico 87545
 $\text{Pu}(P)$
- Los Alamos Scientific Laboratory,
see University of California
Los Alamos Scientific Laboratory
- 101 Los Angeles County USC Medical Center
1200 N. State Street, Box 112 GH
Los Angeles, California 90033
 $^{47}\text{Ca}(0)$
- 102 Lovelace Clinic
4800 Gibson Boulevard, S.E.
Albuquerque, New Mexico 87108
 $\text{MCP}(0)$, $^{233}\text{U}(0)$, $^{232}\text{U}(0)$
- 103 Lovelace Foundation of Medicine
5200 Gibson Boulevard, S.E.
Albuquerque, New Mexico 87108
 $\text{NU}(P)$
- 104 Mallinckrodt Chemical Works
3600 N. Second Street
St. Louis, Missouri 63160
 $^{137}\text{Cs}(0)$, $^{152+154}\text{Eu}(0)$, $^{127}\text{Xe}(B)^*$,
 $^{133}\text{Xe}(0)$
- Mallinckrodt Institute of Radiology,
see Washington University School
of Medicine
- 105 Mary Hitchcock Memorial Hospital
Radiation Therapy Department
Hanover, New Hampshire 03755
 $\text{MCP}(0)$
- Maryland, University of,
see University of Maryland
- 106 Massachusetts General Hospital
32 Fruit Street
Boston, Massachusetts 02114
 $^{47}\text{Ca}(0)$, $^{18}\text{F}(B)$, $^{82}\text{Sr}(L)$, $^{85}\text{Sr}(L)$
- 107 Massachusetts Institute of Technology
Building 20
Cambridge, Massachusetts 02139
 $^{124}\text{Sb}(B)$

- 108 Mayo Foundation
Rochester, Minnesota 55901
 $^{47}\text{Ca}(\text{O})$, $^{99}\text{Tc}(\text{O})$, $^{127}\text{Xe}(\text{B})^*$
- 109 Memorial Hospital
Department of Nuclear Medicine
1400 East Boulder
Colorado Springs, Colorado 80909
 $^{133}\text{Xe}(\text{O})$
- 110 Merck and Company
Rahway, New Jersey 07065
 $^{60}\text{Co}(\text{O})$
- 111 Methodist Hospital
Nuclear Medicine
1604 N. Capitol Avenue
Indianapolis, Indiana 46202
 $^{127}\text{Xe}(\text{B})^*$
- 112 Methodist Hospital
6720 Bertner
Houston, Texas 77025
 $^{133}\text{Xe}(\text{O})$
- 113 Michael-Reese Hospital
29th Street and Ellis Avenue
Chicago, Illinois 60616
 $^{133}\text{Xe}(\text{O})$

Michigan, University of,
see University of Michigan
- 114 Mine Safety Appliance Company
210 North Braddock Avenue
Pittsburgh, Pennsylvania 15208
 $^{131}\text{I}(\text{O})$
- 115 Mine Safety Appliances Company
R O 2
Evans City, Pennsylvania 16033
 $^{131}\text{I}(\text{O})$
- 116 Mini-Dose Laboratories, Inc.
1825 Emerson Street
Denver, Colorado 80218
 $^{133}\text{Xe}(\text{O})$
- 117 Minnesota Mining and Manufacturing
Company
P.O. Box 3121
St. Paul, Minnesota 55101
 $^{137}\text{Cs}(\text{O})$, $^{85}\text{Kr}(\text{O})$, $\text{MCP}(\text{O})$, $^{95}\text{Nb}(\text{O})$,
 $^{103}\text{Ru}(\text{O})$
- 118 Minnesota Mining and Manufacturing
Company
Twin Cities Army Ammunition Plant
Building 590
New Brighton, Minnesota 55112
 $^{210}\text{Po}(\text{M})$, $^{127}\text{Xe}(\text{B})^*$

Mississippi, University of,
see University of Mississippi
- 119 Monsanto Research Corporation
Dayton Laboratory
1515 Nicholas Road
Dayton, Ohio 45407
 $^{241}\text{Am}(\text{O})$, $\text{Cap}(\text{O})$, $^{252}\text{Cf}(\text{S})$, $^{244}\text{Cm}(\text{O})$
- 120 Monsanto Research Corporation
Mound Facility
P.O. Box 32
Miamisburg, Ohio 45342
 $^{144}\text{Ce}(\text{O})$, $^{137}\text{Cs}(\text{O})$, $\text{MCP}(\text{O})$, $^{106}\text{Ru}(\text{O})$,
 $^{95}\text{Zr}(\text{O})$
- 121 Moravек Biochemicals
15302 E. Proctor Avenue
City of Industry, California 91745
 $^3\text{H}(\text{O})$
- 122 Motorola, Inc.
5005 East McDowell Road
Phoenix Arizona 85008
 $^{85}\text{Kr}(\text{O})$
- NASA, see National Aeronautics
and Space Administration
- 123 N. L. Industries, Inc.
1130 Central Avenue
Albany, New York 12205
 $\text{DU}(\text{P})$

- 124 Nassau County Medical Center
Meadowbrook Hospital
2201 Hempstead Turnpike
East Meadow, New York 11554
 $^{47}\text{Ca}(0)$
- 125 National Aeronautics and
Space Administration
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135
 $^3\text{H}(0)$
- 126 National Aeronautics and Space
Administration
Goddard Space Flight Center
Glendale Road
Greenbelt, Maryland 20771
 $^{153}\text{Gd}(0)$, $^{85}\text{Kr}(0)$, $\text{SS}(0)$
- 127 National Aeronautics and
Space Administration
Ames Research Center
Moffett Field, California 94035
 $^{47}\text{Ca}(0)$
- 128 National Animal Disease Center
ARS, Building #1, Room 121
R. R. 2, Dayton Avenue
Ames, Iowa 50010
 $^{28}\text{Mg}(\text{B})^*$
- 129 National Bureau of Standards
Rec. Room, Building 301
Route 270 and Quince Orchard Rd.
Gaithersburg, Maryland 20760
 $^{238}\text{Pu}(\text{M})$, $^{127}\text{Xe}(\text{B})^*$
- 130 National Bureau of Standards
Connecticut Avenue and
Van Ness Street, N.W.
Washington, D.C. 20234
 $^{140}\text{Ba}(0)$, $^{252}\text{Cf}(0)$, $^{237}\text{Np}(0)$, $\text{Tgs}(0)$,
 $^{235}\text{U}(0)$, $^{133}\text{Xe}(0)$
- 131 National Institutes of Health
Building 21
Bethesda, Maryland 20014
 $^{47}\text{Ca}(0)$, $^{43}\text{K}(0)$, $^{91}\text{Y}(0)$, $^{127}\text{Xe}(\text{B})^*$
- 132 National Lead of Ohio
P.O. Box 39158
Cincinnati, Ohio 45239
 $\text{DU}(\text{P})$, $\text{EU}(\text{P})$
- 133 National Naval Medical Center
Radiation Safety Service
Building #144
Bethesda, Maryland 20014
 $^{127}\text{Xe}(\text{B})^*$
- 134 National Semiconductor Corporation
2900 Semiconductor Drive
Santa Clara, California 95051
 $^{85}\text{Kr}(0)$
- 135 Naval Regional Medical Center
Receiving Officer, Building 505
8750 Mountain Boulevard
Oakland, California 94627
 $^{47}\text{Ca}(0)$, $^{127}\text{Xe}(\text{B})^*$

Navy, see United States Navy

Nebraska, University of,
see University of Nebraska
- 136 New England Medical Center Hospitals
151 Harrison Avenue
Boston, Massachusetts 02111
 $^{89}\text{Sr}(0)$
- 137 New England Nuclear Corporation
575 Albany Street
Boston, Massachusetts 02118
 $^{144}\text{Ce}(0)$, $^{137}\text{Cs}(0)$, $\text{CSI}(0)$, $^{153}\text{Gd}(0)$,
 $^3\text{H}(0)$, $^{129}\text{I}(0)$, $^{85}\text{Kr}(0)$, $\text{MCP}(0)$,
 $^{63}\text{Ni}(0)$, $^{33}\text{P}(0)$, $^{147}\text{Pm}(0)$, $^{103}\text{Ru}(0)$,
 $\text{RW}(0)$, $^{151}\text{Sm}(0)$, $^{90}\text{Sr}(0)$, $^{99}\text{Tc}(0)$,
 $^{133}\text{Xe}(0)$, $^{95}\text{Zr}(0)$,
- 138 New England Nuclear Corporation
601 Treble Cove Rd.
North Billerica, Massachusetts 01862
 $^{109}\text{Cd}(\text{B})^*$, $^{68}\text{Ge}(\text{B})$, $^{22}\text{Na}(\text{B})^*$,
 $^{127}\text{Xe}(\text{B})^*$

- New Orleans, University of,
see University of New Orleans
- New York, State University of
see State University of New York
- 139 New York University Medical Center
550 First Avenue
New York, New York 10016
 $^{233}\text{U}(0)$, $^{235}\text{U}(0)$
- 140 North Carolina Baptist Hospital
Nuclear Medicine
300 S. Hawthorne
Winston-Salem, North Carolina 27103
 $^{127}\text{Xe}(B)^*$
- 141 North Carolina Memorial Hospital
Division of Nuclear Medicine
Chapel Hill, North Carolina 27514
 $^{123}\text{I}(B)$, $^{127}\text{Xe}(B)^*$
- 142 North Shore University Hospital
Department of Nuclear Medicine
300 Community Drive
Manhasset, New York 10030
 $^{125}\text{I}(B)$
- 143 North Texas State University
P.O. Box 13767
N. T. Station
Denton, Texas 76203
 $^{252}\text{Cf}(0)$
- 144 Northwestern Memorial Hospital
Nuclear Medicine
239 E. Chicago Avenue
Chicago, Illinois 60611
 $^{127}\text{Xe}(B)^*$
- 145 Northwestern University
619 Clark Street
Evanston, Illinois 60201
 $^{129}\text{I}(0)$, $\text{MCP}(0)$
- 146 Norwalk Hospital
Nuclear Medicine
24 Stevens Street
Norwalk, Connecticut 06850
 $^{127}\text{Xe}(B)^*$
- 147 Nuclear Dynamics
2614 Seaman Avenue
El Monte, California 91733
 $^{241}\text{Am}(0)$
- 148 Nuclear Environmental Engineering, Inc.
P.O. Box 58866
Houston, Texas 77058
 $^{241}\text{Am}(0)$, $^{137}\text{Cs}(0)$, $^3\text{H}(0)$, $^{192}\text{Ir}(0)$,
 $^{85}\text{Kr}(0)$, $\text{MCP}(0)$, $\text{RW}(0)$
- 149 Nuclear Fuel Services, Incorporated
Erwin, Tennessee 37650
 $^{99}\text{Tc}(0)$
- 150 Nuclear Materials, Inc.
2229 Main Street
Concord, Massachusetts 01742
 $\text{DU}(P)$
- 151 Nuclear Radiation Development, Inc.
2937 Alt Boulevard
Grand Island, New York 14072
 $^{241}\text{Am}(0)$
- 152 Nuclear Sources and Services
P.O. Box 14023
Houston, Texas 77021
 $^{241}\text{Am}(0)$
- 153 Nuclide Corporation
642 East College Avenue
State College, Pennsylvania 16801
 $^{238}\text{U}(M)$
- 154 Oak Ridge Associated Universities
P.O. Box 117
Oak Ridge, Tennessee 37830
 $\text{CSI}(0)$, $\text{MCP}(0)$, $\text{SS}(0)$, $^{99}\text{Tc}(0)$
- 155 Occidental Oil Shale Company, Inc.
P.O. Box 2999
Grand Junction, Colorado 81501
 $^{85}\text{Kr}(0)$
- 156 Ohio State University
190 North Oval Drive
Columbus, Ohio 43210
 $^{89}\text{Sr}(0)$

- 157 Ohio State University
Research Foundation
1315 Kinnear Road
Columbus, Ohio 43212
 $^{153}\text{Gd}(0)$, $^3\text{H}(0)$, $^{89}\text{Sr}(0)$, $\text{Tgs}(0)$
- 158 Oklahoma Medical Research Institute
825 N.E. 13th Street
Oklahoma City, Oklahoma 73104
 $\text{SS}(0)$

Oregon, University of,
see University of Oregon
- 159 Oregon State University
Corvallis, Oregon 97330
 $^{252}\text{Cf}(s)$
- 160 Pacific Radiopharmacy
347 North Kuakini Street
Honolulu, Hawaii 96817
 $^{133}\text{Xe}(0)$
- 161 Palmdale General Hospital
Palmdale, California 93550
 $^{133}\text{Xe}(0)$

Pennsylvania, University of,
see University of Pennsylvania
- 162 Penrose Hospital
2215 North Cascade
Colorado Springs, Colorado 80907
 $^{133}\text{Xe}(0)$
- 163 Pleasant Valley Hospital
2309 Antonio Avenue
Camarillo, California 93010
 $^{133}\text{Xe}(0)$

Pittsburgh, University of,
see University of Pittsburgh
- 164 Purdue University
Chemistry Department
W. Lafayette, Indiana 47907
 $\text{RSI}(A)$
- 165 Rad X Corporation
1390 W. Belt North
Houston, Texas 77043
 $^{127}\text{Xe}(B)^*$
- 166 Radiation Resources, Inc.
24 Kulick Road
Fairfield, New Jersey 07006
 $^{137}\text{Cs}(0)$, $\text{MCP}(0)$
- 167 Radium Chemical Company, Inc.
161 East 42nd Street
New York, New York 10036
 $^3\text{H}(0)$
- 168 Raytheon Company
350 Ellis Street
Mountain View, California 94042
 $^{85}\text{Kr}(0)$
- 169 Reactor Experiments, Inc.
963 Terminal Way
San Carlos, California 94070
 $^{233}\text{U}(0)$
- 170 Rensselaer Polytechnic Institute
Service Building
Troy, New York 12181
 $^{28}\text{Mg}(B)^*$
- 171 Reuter-Stokes Electronics Components
18530 South Miles Parkway
Warrensville Heights
Cleveland, Ohio 44128
 $^{234}\text{U}(0)$

Rhode Island, University of,
see University of Rhode Island
- 172 Richland Memorial Hospital
Nuclear Medicine
3301 Harden Street
Columbia, South Carolina 29203
 $^{127}\text{Xe}(B)^*$

Rochester, University of,
see University of Rochester

- 173 Rockwell International
 Atomics International Division
 Rocky Flats Plant
 Rocky Flats, Colorado 80401
 $^{241}\text{Am}(\text{P})$, $^{243}\text{Am}(\text{O})$, $\text{Du}(\text{P})$, $\text{Pu}(\text{P})$,
 $^{238}\text{Pu}(\text{M})$, $^{239}\text{Pu}(\text{M})$, $^{236}\text{Pu}(\text{O})$, $\text{Tgs}(\text{O})$
- 174 Rockwell Hanford Operations
 P.O. Box 800
 Richland, Washington 99352
 $^{241}\text{Am}(\text{H})$, $\text{DU}(\text{P})$, $\text{Pu}(\text{P})$, $^{239}\text{Pu}(\text{H})$,
 $^{238}\text{Pu}(\text{P})$, $\text{RaDEF}(\text{H})$, $^{90}\text{SrY}(\text{H})$, $^{233}\text{U}(\text{P})$
- 175 Rush Presbyterian
 St. Luke's Medical Center
 Nuclear Medicine
 1753 W. Congress Parkway
 Chicago, Illinois 60612
 $^{52}\text{Fe}(\text{B})$, $^{89}\text{Sr}(\text{O})$
- San Francisco, University of,
 see University of San Francisco
- 176 Sandia Laboratories
 P.O. Box 5800
 Albuquerque, New Mexico 87115
 $^{252}\text{Cf}(\text{O})$, $\text{DU}(\text{P})$, $^{85}\text{Kr}(\text{O})$, $^{237}\text{Np}(\text{O})$,
 $\text{Tc}(\text{O})$, $^{99}\text{Tc}(\text{O})$, $\text{Tgs}(\text{O})$, $^{238}\text{U}(\text{O})$
- 177 Sandia Laboratories
 Kirtland Air Force Base (East)
 Receiving Section, Building 895
 Albuquerque, New Mexico 87115
 $^3\text{H}(\text{M})$, $^{238}\text{Pu}(\text{M})$
- 178 Schlumberger Technology Corporation
 Old Quarry Road
 P.O. Box 307
 Ridgefield, Connecticut 06877
 $^{252}\text{Cf}(\text{S})$
- 179 Schwarz Bio-Research, Inc.
 Mountain View Avenue
 Orangeburg, New York 10962
 $^3\text{H}(\text{O})$
- 180 Scripps Clinic and Research Foundation
 476 Prospect Street
 La Jolla, California 92037
 $^{89}\text{Sr}(\text{O})$
- 181 Self-Powered Lighting, Ltd.
 8 Westchester Plaza
 Elmsford, New York 10523
 $^3\text{H}(\text{O})$
- 182 Shell Development Company
 1410 45th Street
 Emeryville, California 94608
 $^{85}\text{Kr}(\text{O})$
- 183 Shepherd and Associates, J. L.
 1614 Victory Boulevard
 Glendale, California 91201
 $^{137}\text{Cs}(\text{O})$, $\text{MCP}(\text{O})$
- 184 Signetics Corporation
 1275 South 300 East
 Orem, Utah 84057
 $^{85}\text{Kr}(\text{O})$
- 185 Sloan-Kettering Institute
 425 East 68th Street
 New York, New York 10021
 $^{133}\text{Xe}(\text{O})$
- 186 Source Production and Equipment Co., Inc.
 625 Oxley Street
 Kenner, Louisiana 70062
 $^{192}\text{Ir}(\text{O})$, $\text{RW}(\text{O})$
- South Alabama, University of,
 see University of South Alabama
- South Carolina, University of,
 see University of South Carolina
- Southern California, University of,
 see University of Southern California
- 187 Spire Corporation
 Patriots Park
 Bedford, Massachusetts, 01730
 $^{60}\text{Co}(\text{O})$, $\text{MCP}(\text{O})$, $\text{Tgs}(\text{O})$

- 188 St. Francis Hospital
Department of Nuclear Medicine
6161 South Yale
Tulsa, Oklahoma 74136
 $^{133}\text{Xe}(0)$
- 189 St. John's Hospital
333 North F Street
Oxnard, California 93030
 $^{133}\text{Xe}(0)$
- 190 St. John's Mercy Medical Center
615 South New Ballas Road
Nuclear Medicine
St. Louis, Missouri 63147
 $^{133}\text{Xe}(0)$
- 191 St. Mary's College
Winona, Minnesota 55987
 $^{239}\text{Pu}(M)$
- 192 St. Patrick Hospital
524 South Ryan Street
Lake Charles, Louisiana 70601
 $^{133}\text{Xe}(0)$
- 193 St. Vincent Medical Center
3rd and Grandview
Los Angeles, California 90057
 $^{133}\text{Xe}(0)$
- 194 State university of New York
Downstate Medical Center
450 Clarkson Avenue
Brooklyn, New York 11203
 $^{99}\text{Tc}(0)$
- 195 State University of New York
Buffalo, New York 14214
 $^{18}\text{F}(B)$, $^{89}\text{Sr}(0)$
- 196 State University of New York
Research Foundation
Stony Brook, New York 11790
 $\text{Tgs}(0)$, $^{235}\text{U}(0)$
- 197 Statek Corporation
1200 Alvarez Avenue
Orange, California 92668
 $^{85}\text{Kr}(0)$
- 198 Swedish-American Hospital
1400 Charles Street
Rockford, Illinois 61101
 $^{133}\text{Xe}(0)$
- 199 Syntex Corporation
3401 Hillview Avenue
Palo Alto, California 94304
 $^3\text{H}(0)$
- 200 Technetium Corporation
1111 Rose Hill Drive
Charlottesville, Virginia 22901
 $\text{Tgs}(0)$
- 201 Technical Operations
South Avenue
Burlington, Massachusetts 01803
 $^{137}\text{Cs}(0)$, $^{192}\text{Ir}(0)$, $\text{MCP}(0)$, $\text{RW}(0)$
- 202 Teledyne Energy Systems
110 West Timonium Road
Timonium, Maryland 21093
 $^{238}\text{Pu}(M)$
- 203 Teledyne Wah Chang Albany
Division of Teledyne Ind., Inc.
P.O. Box 460
Albany, Oregon 97321
 $^{233}\text{U}(0)$
- 204 Tempset, Inc.
1251 Grover Road
St. Louis, Missouri 63125
 $^{85}\text{Kr}(0)$
- Tennessee, University of,
see University of Tennessee
- 205 Texas Instruments, Inc.
Science Services Division
P.O. Box 5012, Mail Stop 6
Dallas, Texas 75222
 $^{85}\text{Kr}(0)$

- 206 Texas Instruments, Inc.
13588 N. Central Expressway
Dallas, Texas 75243
 $^{238}\text{U}(\text{M})$

Texas, University of
see University of Texas
- 207 Textatope Pharmacy
7342 Oak Manor
San Antonio, Texas 78229
 $^{133}\text{Xe}(\text{O})$
- 208 Textatope Pharmacy
3911 Tulane Avenue
New Orleans, Louisiana 70119
 $^{133}\text{Xe}(\text{O})$
- 209 Touro Infirmary
Research Department
1401 Foucher Street
New Orleans, Louisiana 70115
 $^{28}\text{Mg}(\text{B})^*$
- 210 Trio-Tech, Inc.
A Division of Tracer Flo
2435 N. Naomi
Burbank, California 91504
 $^{85}\text{Kr}(\text{O}), \text{SS}(\text{O})$
- 211 Union Carbide Corporation
P.O. Box X
Oak Ridge, Tennessee 37830
 $^{241}\text{Am}(\text{O}), ^{243}\text{Am}(\text{O}), ^{140}\text{Ba}(\text{O}),$
 $^{249}\text{Bk}(\text{O}), ^{47}\text{Ca}(\text{O}), ^{249}\text{Cf}(\text{O}), ^{244}\text{Cm}(\text{O}),$
 $^{58}\text{Co}(\text{H}), ^{60}\text{Co}(\text{O}), \text{CSI}(\text{O}), ^{137}\text{Cs}(\text{O}),$
 $^{153}\text{Gd}(\text{O}), ^3\text{H}(\text{O}), ^3\text{H}(\text{P}), ^{131}\text{I}(\text{O}),$
 $^{85}\text{Kr}(\text{O}), \text{MCP}(\text{O}), ^{54}\text{Mn}(\text{H}), ^{95}\text{Nb}(\text{O}),$
 $\text{Np}(\text{P}), ^{231}\text{Pa}(\text{M}), \text{Pu}(\text{P}), ^{239}\text{Pu}(\text{O}),$
 $^{106}\text{Ru}(\text{O}), ^{151}\text{Sm}(\text{O}), ^{89}\text{Sr}(\text{O}), \text{SS}(\text{O}),$
 $^{99}\text{Tc}(\text{O}), \text{Tgs}(\text{O}), ^{229}\text{Th}(\text{M}), ^{230}\text{Th}(\text{M}),$
 $^{234}\text{Th}(\text{M}), ^{232}\text{Th}(\text{O}), ^{233}\text{U}(\text{O}), ^{235}\text{U}(\text{O}),$
 $^{236}\text{U}(\text{O}), ^{238}\text{U}(\text{O}), ^{133}\text{Xe}(\text{O}), ^{95}\text{Zr}(\text{O})$
- 212 Union Carbide Corporation
Nuclear Division
Oak Ridge Gaseous Diffusion Plant, K-25
Oak Ridge, Tennessee 37830
 $^{238}\text{U}(\text{M})$
- 213 Union Carbide Corporation,
Nuclear Division
Oak Ridge Gaseous Diffusion Plant
Post Office Box P
Oak Ridge, Tennessee 37830
 $^{85}\text{Kr}(\text{O}), ^{230}\text{Th}(\text{O}), ^{133}\text{Xe}(\text{O})$
- 214 Union Carbide Corporation
Nuclear Division Y-12 Plant
P.O. Box Y
Oak Ridge, Tennessee 37830
 $^{241}\text{Am}(\text{O}), \text{CSI}(\text{O}), \text{DU}(\text{P}), \text{EU}(\text{P}), ^{153}\text{Gd}(\text{O}),$
 $\text{SS}(\text{O}), \text{Tgs}(\text{O}), ^{235}\text{U}(\text{M}), ^{233}\text{U}(\text{O}),$
 $^{235}\text{U}(\text{O}), ^{238}\text{U}(\text{O})$
- 215 Unit Process Assemblies, Inc.
53-15 37th Avenue
Woodside, New York 11377
 $^{147}\text{Pm}(\text{O}), ^{90}\text{Sr}(\text{O})$
- 216 UNC Nuclear Industries, Inc.
P.O. Box 490
Richland, Washington 99352
 $^{241}\text{Am}(\text{H}), ^{133}\text{Ba}(\text{H}), ^{144}\text{CePr}(\text{H}),$
 $^{109}\text{Cd}(\text{H}), ^{57}\text{Co}(\text{H}), ^{134}\text{Cs}(\text{H}),$
 $^{137}\text{Cs}(\text{H}), \text{DU}(\text{P}), \text{EU}(\text{P}), ^{54}\text{Mn}(\text{H}),$
 $^{106}\text{Ru}(\text{H}), ^{85}\text{Sr}(\text{H}), \text{Th}(\text{P}), ^{65}\text{Zn}(\text{H})$
- 217 United States Air Force Academy
USAF Academy, Colorado 80840
 $^{252}\text{Cf}(\text{S})$
- 218 United States Army
Aberdeen Proving Ground
Ballistics Research Laboratory
Aberdeen Proving Ground, Maryland 21005
 $\text{DU}(\text{P})$
- 219 United States Army
Aberdeen Proving Ground
Materiel Command
Aberdeen Proving Ground, Maryland 21005
 $\text{DU}(\text{P})$

- 220 United States Army
Letterman Medical Center
Finance and Accounting Division
Building 102
Presidio of San Francisco, California 94129
 $^{47}\text{Ca}(0)$, $^{133}\text{Xe}(0)$
- 221 United States Department of Energy
Chicago Operations Office
Finance Division
9800 South Cass Avenue
Argonne, Illinois 60439
 $^{252}\text{Cf}(0)$, $^{85}\text{Kr}(0)$, SS(0)
- 222 United States Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352
 $^{243}\text{Am}(0)$, $^{152+154}\text{Eu}(0)$, $^{236}\text{Pu}(0)$,
 $^{95}\text{Zr}(0)$

For other listings for the
United States Department of Energy,
see Department of Energy

United States Department of Interior,
see Department of Interior
- 223 United States Geological Survey
Financial Management
National Center, Room 1447-A
12201 Sunrise Valley Drive
Reston, Virginia 22092
 $^{243}\text{Am}(0)$, $^{144}\text{Ce}(0)$, $^{244}\text{Cm}(0)$,
 $^{237}\text{Np}(0)$, $^{236}\text{Pu}(0)$
- 224 United States Navy
Ammunition Depot
Crane, Indiana 47522
 $^{85}\text{Kr}(0)$
- 225 United States Public Health Service
P.O. Box 684
4505 Maryland Parkway
Las Vegas, Nevada 89101
 $^{230}\text{Th}(0)$
- 226 United States Public Health Service
Hospital
15th Avenue and Lake Street
San Francisco, California 94118
 $^{47}\text{Ca}(0)$
- 227 United States Radium Corporation
4150 Old Berwick Road
P.O. Box 380
Bloomsburg, Pennsylvania 17815
 $^3\text{H}(0)$
- 228 United States Testing Company, Inc.
2800 George Washington Way
Richland, Washington 99352
 $^{241}\text{Am}(\text{H})$, $^{147}\text{Pm}(\text{H})$, $^{210}\text{Po}(\text{H})$,
 $^{239}\text{Pu}(\text{H})$, $^{236}\text{Pu}(0)$, $^{90}\text{SrY}(\text{H})$,
U (natural)(H)
- 229 United Technologies Corporation
Silver Lane
East Hartford, Connecticut 06108
 $\text{Cap}(0)$, $^{244}\text{Cm}(0)$
- 230 University of Alabama
Medical Center
1919 Seventh Avenue, South
Birmingham, Alabama 35486
 $^{133}\text{Xe}(0)$
- 231 University of Arizona
Post Office Drawer 4100
Tucson, Arizona 85721
MCP(0)
- 232 University of Arkansas
Fayetteville, Arkansas 72701
 $^{252}\text{Cf}(\text{S})$
- 233 University of California
Lawrence Berkeley Laboratory
University of California
Berkeley, California 94720
 $^{249}\text{Bk}(0)$, $^{248}\text{Cm}(0)$, $\text{Pu}(\text{P})$, $^{82}\text{Sr}(\text{L})$,
 $^{85}\text{Sr}(\text{L})$, SS(0), $^{99}\text{Tc}(0)$, $^{234}\text{U}(0)$

- 234 University of California
Davis, California 95616
 $^{129}\text{I}(\text{O})$
- 235 University of California
Post Office Box 109
La Jolla, California 92037
 $^{144}\text{Ce}(\text{O})$, $^{127}\text{Xe}(\text{B})^*$
- 236 University of California - San Diego
Chemistry Department
3175 Miramar Road
La Jolla, California 92093
RSI(A)
- 237 University of California
Nuclear Medicine Department
3175 Miramar Road
La Jolla, California 92093
 $^{82}\text{Sr}(\text{L})$, $^{85}\text{Sr}(\text{L})$
- 238 University of California
Lawrence Livermore Laboratory
P.O. Box 808
Livermore, California 94551
 $^{241}\text{Am}(\text{O})$, $^{243}\text{Am}(\text{O})$, $^{249}\text{Bk}(\text{O})$,
 $^{244}\text{Cm}(\text{O})$, $^{248}\text{Cm}(\text{O})$, $^{253}\text{Es}(\text{O})$,
 $^{257}\text{Fm}(\text{O})$, $^3\text{H}(\text{O})$, $\text{MCP}(\text{O})$, $^{239}\text{Pu}(\text{O})$,
 $^{244}\text{Pu}(\text{O})$, $\text{Pu}(\text{P})$, $\text{SS}(\text{O})$, $\text{Tgs}(\text{O})$, $^{233}\text{U}(\text{O})$,
 $^{235}\text{U}(\text{O})$,
- 239 University of California
900 Veteran Avenue
Los Angeles, California 90024
 $^{243}\text{Am}(\text{O})$, $^{244}\text{Cm}(\text{O})$, $^{133}\text{Xe}(\text{O})$
- 240 University of California
Radiology Department
650 Circle Drive, South
Los Angeles, California 90024
 $^{52}\text{Fe}(\text{L})$
- 241 University of California
Purchasing Department
Orange, California 92668
 $^{90}\text{Sr}(\text{O})$
- 242 University of California
University Hospital Rec.
225 W. Dickinson Street
San Diego, California 92103
 $^{127}\text{Xe}(\text{B})^*$
- 243 University of California
San Francisco Medical Center
San Francisco, California 94122
 $^{252}\text{Cf}(\text{S})$, $^{133}\text{Xe}(\text{O})$
- 244 University of California
Los Alamos Scientific Laboratory
Los Alamos, New Mexico 87544
 $^{241}\text{Am}(\text{O})$, $\text{Cap}(\text{O})$, $^{249}\text{Cf}(\text{O})$, $^{252}\text{Cf}(\text{O})$,
 $^{252}\text{Cf}(\text{S})$, $^{243}\text{Cm}(\text{O})$, $^{248}\text{Cm}(\text{O})$, $^{58}\text{Co}(\text{H})$,
 $^{253}\text{Es}(\text{O})$, $^{56}\text{Mn}(\text{H})$, $^{239}\text{Pu}(\text{M})$, $^{238}\text{Pu}(\text{M})$,
 $^{240}\text{Pu}(\text{O})$, $^{244}\text{Pu}(\text{O})$, $\text{SS}(\text{O})$, $\text{Tgs}(\text{O})$,
 $^{236}\text{U}(\text{O})$, $^{238}\text{U}(\text{O})$
- 245 University of Chicago
5641 S. Ingleside Avenue
Chicago, Illinois 60637
RSI(A)
- 246 University of Chicago
950 E. 59th Street
Chicago, Illinois 60637
 $^{252}\text{Cf}(\text{S})$, $^{82}\text{Sr}(\text{L})$, $^{85}\text{Sr}(\text{L})$
- 247 University of Chicago
Office of the Comptroller
1525 E. Hyde Park Boulevard
Chicago, Illinois 60615
 $^{47}\text{Ca}(\text{O})$, $^{89}\text{Sr}(\text{O})$
- 248 University of Chicago
1160 East 55th Street
Chicago, Illinois 60615
 $^{47}\text{Ca}(\text{O})$, $^{89}\text{Sr}(\text{O})$
- 249 University of Connecticut
Physiology Department
Farmington, Connecticut 06032
 $^{28}\text{Mg}(\text{B})^*$

- 250 University of Kansas Medical Center
Department of Diagnostic Radiation
39th and Rainbow Boulevard
Kansas City, Kansas 66103
 $^{77}\text{Br}(\text{L})$, $^{47}\text{Ca}(\text{O})$ $^{127}\text{Xe}(\text{B})\star$
- 251 University of Kentucky
Lexington, Kentucky 40506
 $^{252}\text{Cf}(\text{S})$, $^3\text{H}(\text{O})$, $\text{MCP}(\text{O})$, $^{28}\text{Mg}(\text{B})\star$
- 252 University of Loyola Medical Center
2160 S. 1st Avenue
Maywood, Illinois 60153
 $\text{CSI}(\text{A})$
- 253 University of Maryland
Baltimore County Campus
5401 Wilkins Drive
Baltimore, Maryland 21228
 $^{106}\text{Ru}(\text{O})$
- 254 University of Michigan
Ann Arbor, Michigan 48104
 $^{252}\text{Cf}(\text{S})$, $^{237}\text{Np}(\text{O})$, $^{99}\text{Tc}(\text{O})$, $\text{Tgs}(\text{O})$,
 $^{233}\text{U}(\text{O})$
- 255 University of Mississippi
Jackson, Mississippi 39216
 $^{43}\text{K}(\text{O})$, $^{28}\text{Mg}(\text{B})\star$
- 256 University of Nebraska
511 Administration
Lincoln, Nebraska 68508
 $^{232}\text{U}(\text{O})$
- 257 University of New Orleans
Lakefront
New Orleans, Louisiana 70122
 $\text{CSI}(\text{O})$
- 258 University of Oregon
Oregon Medical School
3181 S. W. Sam Jackson Park Road
Portland, Oregon 97201
 $^{133}\text{Xe}(\text{O})$
- 259 University of Pennsylvania
3025 Walnut Street
Philadelphia, Pennsylvania 19104
 $^{252}\text{Cf}(\text{O})$, $\text{Tgs}(\text{O})$, $^{133}\text{Xe}(\text{O})$
- 260 University of Pennsylvania Hospital
Radiology Department
3400 Spruce Street
Philadelphia, Pennsylvania 19104
 $^{18}\text{F}(\text{B})$, $^{123}\text{I}(\text{B})$
- 261 University of Pittsburgh
Pittsburgh, Pennsylvania 15213
 $^{243}\text{Am}(\text{O})$, $^{236}\text{Pu}(\text{O})$
- 262 University of Rhode Island
Narragansett Marine Laboratory
Kingston, Rhode Island 02881
 $^{140}\text{Ba}(\text{O})$, $^{137}\text{Cs}(\text{O})$
- 263 University of Rochester
575 Elmwood Avenue
Rochester, New York 14627
 $^{242}\text{Pu}(\text{O})$, $\text{Tgs}(\text{O})$
- 264 University of San Francisco
Golden Gate and Parker Avenues
San Francisco, California 94117
 $^{237}\text{Np}(\text{O})$, $\text{Tgs}(\text{O})$, $^{235}\text{U}(\text{O})$
- 265 University of South Alabama
Nuclear Medicine Laboratory
2451 Sillingim
Mobile, Alabama 36688
 $^{28}\text{Mg}(\text{B})\star$
- 266 University of South Carolina
Columbia, South Carolina 29208
 $^{106}\text{Ru}(\text{O})$
- 267 University of Southern California
University Park
Los Angeles, California 90007
 $\text{MCP}(\text{O})$

- 268 University of Southern California
School of Pharmacy
1985 Zonal Avenue
Los Angeles, California 90033
 $^{252}\text{Cf}(\text{S})$
- 269 University of Tennessee
Knoxville, Tennessee 37916
 $^{192}\text{Ir}(\text{O})$, $^{28}\text{Mg}(\text{B})^*$, $^{238}\text{U}(\text{O})$
- 270 University of Tennessee-DOE
Agriculture Research Laboratory
1299 Bethel Valley Road
Oak Ridge, Tennessee 37830
 $^{95}\text{Nb}(\text{O})$
- 271 University of Texas
Austin, Texas 78712
 $^{129}\text{I}(\text{O})$
- 272 University of Texas
Nuclear Medicine Service
Room 229, Clinical Science Building
Galveston, Texas 77550
 $^{47}\text{Ca}(\text{O})$, $^{127}\text{Xe}(\text{B})^*$, $^{133}\text{Xe}(\text{O})$
- 273 University of Texas at Dallas
P.O. Box 30365
Dallas, Texas 75230
 $^{47}\text{Ca}(\text{O})$
- 274 University of Utah
Purchasing Department
Salt Lake City, Utah 84112
 $^{241}\text{Pu}(\text{O})$, $^{244}\text{Pu}(\text{O})$, $^{133}\text{Xe}(\text{O})$
- 275 University of Virginia
Charlottesville, Virginia 22901
 $^{99}\text{Tc}(\text{O})$, $^{127}\text{Xe}(\text{B})^*$
- 276 University of Virginia Hospital
Charlottesville, Virginia 22901
 $^{153}\text{Gd}(\text{O})$, $^{SS}(\text{O})$, $^{127}\text{Xe}(\text{B})^*$
- 277 University of Washington
400 Administration Building
Seattle, Washington 98105
 $^{244}\text{Cm}(\text{O})$, $^{129}\text{I}(\text{O})$, $^{244}\text{Pu}(\text{O})$, $^{238}\text{Pu}(\text{O})$,
 $^{239}\text{Pu}(\text{O})$, $^{240}\text{Pu}(\text{O})$, $^{89}\text{Sr}(\text{O})$, $\text{Tgs}(\text{O})$,
 $^{133}\text{Xe}(\text{O})$
- 278 University of Wisconsin
750 University Avenue
Madison, Wisconsin 53706
 $^{153}\text{Gd}(\text{O})$, $^3\text{H}(\text{O})$, $^{SS}(\text{O})$

Utah, University of,
see University of Utah
- 279 Veterans Administration
Data Processing Center
1615 Woodward Street East
Austin, Texas 78722
 $\text{MCP}(\text{O})$, $^{133}\text{Xe}(\text{O})$
- 280 Veterans Administration Center
Wood, Wisconsin 53193
 $^{43}\text{K}(\text{O})$
- 281 Veterans Administration Hospital
700 South 19th Street
Birmingham, Alabama 35233
 $^{99}\text{Tc}(\text{O})$, $^{133}\text{Xe}(\text{O})$
- 282 Veterans Administration Hospital
Chief Supply Service
11201 Benton Street
Loma Linda, California 92354
 $^{127}\text{Xe}(\text{B})^*$
- 283 Veterans Administration Hospital
Wilshire and Sawtelle Boulevards
Los Angeles, California 90073
 $^{47}\text{Ca}(\text{O})$
- 284 Veterans Administration Hospital
1055 Clerrmont Street
Denver, Colorado 80220
 $^{133}\text{Xe}(\text{O})$

- 285 Veterans Administration Hospital
Chief Supply Service
1201 North West 16th Street
Miami, Florida 33125
 $^{133}\text{Xe}(0)$
- 286 Veterans Administration Hospital
Chief Supply Service
Building #7
Hines, Illinois 60141
 $^{47}\text{Ca}(0)$, $^{252}\text{Cf}(S)$, $^{28}\text{Mg}(B)*$
- 287 Veterans Administration Hospital
1310 24th Avenue S.
Nashville, Tennessee 37203
 $^{133}\text{Xe}(0)$
- 288 Veterans Administration Hospital
1400 VFW Parkway
W. Roxbury, Massachusetts 02132
 $^{123}\text{I}(B)$, $^{127}\text{Xe}(B)*$
- 289 Veterans Administration Hospital
Nuclear Medicine
Northport, New York 11768
 $^{127}\text{Xe}(B)*$
- 290 Veterans Administration Hospital
Nuclear Medicine NM-115
4435 Beacon Avenue South
Seattle, Washington 98108
 $^{103}\text{Ru}(B)$
- 291 Vanderbilt University
Radiation Safety
Room 2, U0217
Nashville, Tennessee 37232
 ^{127}Xe

Virginia, University of,
see University of Virginia
- 292 Vought Corporation
P.O. Box 6144
Dallas, Texas 75222
 $^{252}\text{Cf}(S)$

Washington, University of,
see University of Washington
- 293 Washington University
Lindell and Skinker
St. Louis, Missouri 63130
 $^{47}\text{Ca}(0)$, $^{131}\text{I}(0)$, $^{133}\text{Xe}(0)$
- 294 Washington University
Department of Radiology
499 South Euclid
St. Louis, Missouri 63110
 $^{77}\text{Br}(L)$
- 295 Washington University School of Medicine
Mallinkrodt Institute of Radiology
510 South Kings Highway
St. Louis, Missouri 63110
 $^{252}\text{Cf}(S)$
- 296 Western Electric Company
P.O. Box 241
Reading, Pennsylvania 19603
 $^{85}\text{Kr}(0)$
- 297 Western Electric Company, Inc.
P.O. Box 1409
Lawrence, Massachusetts 01842
 $^{85}\text{Kr}(0)$
- 298 Western Michigan University
Kalamazoo, Michigan 49001
 $^3\text{H}(0)$, $\text{Tgs}(0)$
- 299 Westinghouse Electric Corporation
Bettis Atomic Power Laboratory
P.O. Box 79
West Mifflin, Pennsylvania 15122
 $\text{Tgs}(0)$, $^{232}\text{Th}(0)$, $^{233}\text{U}(0)$, $^{235}\text{U}(0)$
- 300 Westinghouse Electric Corporation
P.O. Box 284
Elmira, New York 14902
 $^{234}\text{U}(0)$, $^{238}\text{U}(0)$
- 301 Westinghouse Electric Corporation
Advanced Reactors Division
P.O. Box 158
Madison, Pennsylvania 15663
 $^{243}\text{Am}(0)$, $^{244}\text{Cm}(0)$

- 302 Westinghouse Hanford Company
Hanford Engineering Development
Laboratory
P.O. Box 1970
Richland, Washington 99352
 $^{241}\text{Am}(\text{O})$, $^{133}\text{Ba}(\text{H})$, $^{144}\text{CePr}(\text{H})$,
 $^{252}\text{Cf}(\text{O})$, $^{252}\text{Cf}(\text{P})$, $^{244}\text{Cm}(\text{H})$,
 $^{134}\text{Cs}(\text{H})$, $^{137}\text{Cs}(\text{H})$, $\text{CSI}(\text{O})$, $\text{DU}(\text{P})$,
 $\text{EU}(\text{P})$, $^{85}\text{Kr}(\text{O})$, $\text{MCP}(\text{O})$, $^{22}\text{Na}(\text{H})$,
 $^{237}\text{Np}(\text{H})$, $^{237}\text{Np}(\text{O})$, $\text{Np}(\text{P})$, $\text{NU}(\text{P})$, $\text{Pu}(\text{P})$,
 $\text{Th}(\text{P})$, $^{233}\text{U}(\text{P})$, $^{90}\text{SrY}(\text{H})$, $^{147}\text{Pm}(\text{H})$,
 $^{239}\text{Pu}(\text{H})$, $^{240}\text{Pu}(\text{H})$, $^{236}\text{Pu}(\text{O})$,
 $^{239}\text{Pu}(\text{O})$, $^{240}\text{Pu}(\text{O})$, $^{241}\text{Pu}(\text{O})$,
 $^{242}\text{Pu}(\text{O})$, $^{106}\text{Ru}(\text{O})$, $\text{SS}(\text{O})$, $\text{Tgs}(\text{O})$,
 $^{230}\text{Th}(\text{O})$, $^{232}\text{Th}(\text{O})$, $^{233}\text{U}(\text{O})$, $^{234}\text{U}(\text{O})$,
 $^{235}\text{U}(\text{O})$, $^{238}\text{U}(\text{O})$
- 303 Westinghouse Research and
Development Center
1310 Beulah Road, Churchill Boro
Pittsburgh, Pennsylvania 15235
 $^{58}\text{Co}(\text{H})$, $^{54}\text{Mn}(\text{H})$
- 304 William Beaumont Hospital
3601 W. Thirteen Mile Road
Royal Oak, Michigan 48072
 $^{133}\text{Xe}(\text{O})$

Wisconsin, University of,
see University of Wisconsin
- 305 Woods Hole Oceanographic Institute
Woods Hole, Massachusetts 02543
 $\text{Sp}(\text{O})$, $^{229}\text{Th}(\text{O})$, $^{236}\text{U}(\text{O})$
- 306 Yale-New Haven Hospital
Diagnostic Radiology and Nuclear
Medicine
333 Cedar Street
New Haven, Connecticut 06510
 $^{81}\text{Kr}(\text{B})$
- 307 Yale University
20 Ashmun Street
New Haven, Connecticut 06520
 $^{129}\text{I}(\text{O})$

B. FOREIGN CUSTOMERS

ARGENTINA

308 Comision Nacional de Energia Atomica
Gerencia de Energia
Avda. del Libertador 8250
Buenos Aires, Argentina
 $^{233}\text{U}(0)$

AUSTRALIA

309 Australian Atomic Energy Comission
Research Establishment
Lucas Heights, Australia
 $^{244}\text{Cm}(0)$, $\text{Tgs}(0)$, $^{127}\text{Xe}(\text{B})^*$

310 Australian Radiation Laboratory
36 Lonsdale Street
Melbourne, Victoria, 3000 Australia
 $^{127}\text{Xe}(\text{B})^*$

311 Embassy of Australia
1601 Massachusetts Avenue, N.W.
Washington, D.C. 20036
 $^{243}\text{Am}(0)$, $^{242}\text{Pu}(0)$, $^{234}\text{U}(0)$

312 Union Carbide/Australia, Ltd.
157-167 Liverpool Street
Sidney, Australia
 $^{127}\text{Xe}(\text{B})$

AUSTRIA

313 International Atomic Energy Agency
Kaertnerring 11-13
A-1010 Vienna, Austria
 $^{241}\text{Am}(0)$, $^{237}\text{Np}(0)$, $\text{Tgs}(0)$, $^{232}\text{Th}(0)$,
 $^{233}\text{U}(0)$, $^{235}\text{U}(0)$, $^{238}\text{U}(0)$

BELGIUM

314 Centre d'Etude de l'Energie Nucleaire
144 Avenue Flasky
Brussels 4, Belgium
 $^{237}\text{Np}(0)$, $^{239}\text{Pu}(0)$, $\text{Tgs}(0)$, $^{235}\text{U}(0)$,
 $^{238}\text{U}(0)$

315 EURATOM
51-53 Rue Belliard
Brussels, Belgium
 $^{236}\text{Pu}(0)$, $^{240}\text{Pu}(0)$, $^{241}\text{Pu}(0)$,
 $^{242}\text{Pu}(0)$

316 European Atomic Energy Commission
Central Bureau for Nuclear Measurements
Geel, Belgium
 $^{239}\text{Pu}(0)$, $^{242}\text{Pu}(0)$, $^{233}\text{U}(0)$

317 Katholieke Universiteit Leuven
Dienst Radioprotektie
De Croylaan 54
Heverlee, Belgium
 $^{28}\text{Mg}(\text{B})^*$

318 Universite de Liege
2 rue Armand Stevart
Liege, Belgium
 $\text{Cap}(0)$, $^{237}\text{Np}(0)$

319 IRE, Institut National des Radioelements
Avenue Eugene Plasky, 144
1040 Brussels, Belgium
 $^{85}\text{Kr}(0)$

CANADA

Alberta, University of,
see University of Alberta

320 Atomic Energy of Canada Limited
Chalk River, Ontario, Canada
 $^3\text{H}(\text{M})$, $^{235}\text{U}(0)$

321 Atomic Energy of Canada Limited
P.O. Box 6300
Postal Station J
Ottawa, Canada
 $^{137}\text{Cs}(0)$, $\text{MCP}(0)$

322 Atomic Energy of Canada Limited
Whiteshell Nuclear Research Establishment
Pinawa, Manitoba, Canada
 $^{230}\text{Th}(0)$

- British Columbia, University of,
see University of British Columbia
- 323 Health Sciences Center
Nuclear Medicine
700 William Avenue
Winnipeg, Canada
 $^{127}\text{Xe}(\text{B})^*$
- Manitoba, University of,
see University of Manitoba
- 324 McGill University
Montreal 2, P.O., Canada
 $^{133}\text{Xe}(\text{O})$
- 325 McMaster University
Hamilton, Ontario, Canada
 $^{129}\text{I}(\text{O})$
- 326 McMaster University Medical Center
Forsyth Avenue Receiving
Hamilton, Ontario, Canada
 $^{127}\text{Xe}(\text{B})^*$
- 327 Mitel Semiconductor, Inc.
18 Airport Boulevard
Bromont, Quebec
Canada JOE 1L0
 $^{85}\text{Kr}(\text{O})$
- 328 Queen's University
Biology Department
Kingston, Ontario, Canada
 $^{28}\text{Mg}(\text{B})^*$, $^{127}\text{Xe}(\text{B})^*$
- 329 Simon Fraser University
Burnaby 2, British Columbia, Canada
 $^{129}\text{I}(\text{O})$
- Toronto, University of,
see University of Toronto
- 330 Toronto General Hospital
101 College Street
Toronto 2, Ontario, Canada
 $^{133}\text{Xe}(\text{O})$
- 331 University Hospital
Nuclear Medicine Department
London, Ontario, Canada
 $^{127}\text{Xe}(\text{B})^*$
- 332 University of Alberta
Edmonton, Alberta, Canada
 $^{252}\text{Cf}(\text{O})$, $^3\text{H}(\text{O})$, $\text{Tgs}(\text{O})$, $^{133}\text{Xe}(\text{O})$
- 333 University of British Columbia
Vancouver 8, British Columbia, Canada
 $^{235}\text{U}(\text{O})$
- 334 University of Manitoba
Department of Animal Science
Winnipeg, Canada
 $^{252}\text{Cf}(\text{O})$, $^{28}\text{Mg}(\text{B})^*$, $^{127}\text{Xe}(\text{B})^*$
- 335 University of Toronto
Toronto, Canada
 $^{252}\text{Cf}(\text{O})$, $^{28}\text{Mg}(\text{B})^*$
- 336 Vancouver General Hospital
Division of Nuclear Medicine
Vancouver, British Columbia, Canada
 $^{127}\text{Xe}(\text{B})^*$, $^{133}\text{Xe}(\text{O})$
- DENMARK
- 337 Isotope Pharmacy
378 Frederikundsvej
Broenshoej, Denmark
 $^{127}\text{Xe}(\text{B})^*$
- ENGLAND
- 338 Brandhurst Co. Ltd.
Wellington Road
High Wycombe, Bucks HP12 3PS
England
 $^3\text{H}(\text{O})$
- 339 Edlow International Co.
Suite 404-5
1100 17th Street, N.W.
Washington, D.C. 20036
 $^3\text{H}(\text{O})$

340 Malinkrodt, Ltd.
Building 521 129G
Southampton Road
Hounslow, Middlesex, England

$^{127}\text{Xe}(\text{B})^*$

Oxford, University of,
see University of Oxford

341 Radiochemical Centre
White Lion Road
Amersham, Bucks, England

$\text{Cap}(\text{O})$, $^{144}\text{Ce}(\text{O})$, $^{244}\text{Cm}(\text{O})$, $^{153}\text{Gd}(\text{O})$,
 $^3\text{H}(\text{O})$, $^{85}\text{Kr}(\text{O})$, $\text{MCP}(\text{O})$, $^{147}\text{Pm}(\text{O})$,
 $^{89}\text{Sr}(\text{O})$, $^{99}\text{Tc}(\text{O})$, $^{91}\text{Y}(\text{O})$, $^{95}\text{Zr}(\text{O})$

342 Sanders-Roe Developments, Ltd.
North Hyde Road
Hayes, Middlesex, England

$^3\text{H}(\text{O})$

343 United Kingdom
Atomic Energy Research Establishment
Didcot, Oxfordshire
England OXON, OX11, ORA

$\text{EU}(\text{P})$, $^{242}\text{Pu}(\text{O})$, $^{234}\text{U}(\text{O})$, $^{235}\text{U}(\text{O})$,
 $^{238}\text{U}(\text{O})$

344 United Kingdom Treasury and Supply
Delegation
25 Broadway
New York, New York 10004

$^3\text{H}(\text{O})$

345 University of Oxford
Nuclear Physics Laboratory
21 Banbury Road
Oxford, England

$^{244}\text{Cm}(\text{O})$, $\text{Tgs}(\text{O})$

346 V. G. Micro Mass
Nat Lane
Winsford, Cheshire, England

$^3\text{H}(\text{M})$

FRANCE

347 CEA
Department des Radioelements
B.P. No. 2
91190 Gif Sur Yvette, France
 $^{140}\text{Ba}(\text{O})$, $^{153}\text{Gd}(\text{O})$, $\text{SS}(\text{O})$

348 French Atomic Energy Commission
1730 Rhode Island Avenue, N.W.
Suite 1217
Washington, D.C. 20036
 $\text{Cap}(\text{O})$, $^{238}\text{Pu}(\text{O})$, $^{242}\text{Pu}(\text{O})$

GERMANY, FEDERAL REPUBLIC OF

349 American Hoechst Corporation
P.O. Box 2500
Somerville, New Jersey 08876
 $^{85}\text{Kr}(\text{O})$

350 Biologische Anstalt Helgoland
Laboratorium Suddorf
Wustland 2, 2000 Hamburg 55
Federal Republic of Germany
 $^{244}\text{Pu}(\text{O})$

351 EURATOM Transuranium Institute
P.O. Box 452
75 Karlsruhe
Federal Republic of Germany
 $^{242}\text{Pu}(\text{O})$, $^{230}\text{Th}(\text{O})$, $^{233}\text{U}(\text{O})$

352 Freie Universitat
1 Berlin 33
Federal Republic of Germany
 $^{129}\text{I}(\text{O})$

353 GWK-Gesellschaft zur Wiederaufbereitung
von Kernt
D-7051 Leopoldshafen,
Federal Republic of Germany
 $^{242}\text{Pu}(\text{O})$

354 Gesellschaft fur Kernforschung mbH
Institut fur Angewandte Reaktor Physik
Weverstrasse 5
75 Karlsruhe
Federal Republic of Germany
 $\text{Cap}(\text{O})$, $^{238}\text{Pu}(\text{O})$, $^{241}\text{Pu}(\text{O})$,
 $^{238}\text{U}(\text{O})$

355 Gesellschaft. fur Schwerionenforschung mbH
Targetlabor
Postfach 541
D-6100 Darmstadt
Federal Republic of Germany

$^{236}\text{Pu}(0)$, $\text{Tgs}(0)$, $^{238}\text{U}(0)$

356 Hahn-Meitner Institut
fur Kernforschung Berlin,
Sektion Kernphysik
Berlin,
Federal Republic of Germany

$^{99}\text{Tc}(0)$

357 Johann Wolfgang Goethe University
Frankfurt/Main
Federal Republic of Germany

$^{236}\text{U}(0)$

358 Kernforschung Sanlage
Postfach 365
517 Julich
Federal Republic of Germany

$^{237}\text{Np}(0)$, $\text{Tgs}(0)$

359 Medizinische Hochschule Hannover
Dept. of Radiologie
Karl-Wiechert-Allee 9
Hannover,
Federal Republic of Germany

$^{127}\text{Xe}(B)^*$

360 Technischen Hochschule Munchen
Arcistrasse 21
8 Munich 2
Germany

$^{241}\text{Am}(0)$, $\text{Cap}(0)$, $^{244}\text{Cm}(0)$, $^{237}\text{Np}(0)$

361 University of Erlangen-Nurnberg
Gluchstr.
852 Erlangen
Federal Republic of Germany

$^{252}\text{Cf}(0)$

362 University of Mainz/Rhein
Mainz am Rhein
Federal Republic of Germany

$^{236}\text{Pu}(0)$

363 University of Munster
44 Munster/Westfalln
Federal Republic of Germany

$^{37}\text{Ar}(0)$

HONG KONG

364 National Cash Register Mfg, Co., Ltd.
No. 55 Wong Chuk Hang Road
Aberdeen, Hong Kong

$^{85}\text{Kr}(0)$

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

$^{85}\text{Kr}(0)$

ISRAEL

366 Landseas Corporation
1212 Avenue of the Americas
New York, New York 10036

$^{237}\text{Np}(0)$, $\text{Tgs}(0)$

367 Packard Instrument, Ltd.
16 Oholian Street
Jerusalem, Israel

$^{28}\text{Mg}(B)^*$

JAPAN

368 International Antex, Inc.
2630 California Street
Mountain View, California 94040

$\text{MCP}(0)$, $^{147}\text{Pm}(0)$

369 Japan Radioisotope Association
Hon-Komagome 2 Chome 28
Bunkyo-Ku
Tokyo, Japan

$\text{MCP}(0)$, $^{147}\text{Pm}(0)$

370 Mitsus and Company (USA), Inc.
200 Park Avenue
New York, New York 10017

$^{234}\text{U}(0)$

371 Reactivity Accident Laboratory
JAERI
Tokai-Mura, Ibaraki-Ken
Japan

EU(P)

NETHERLANDS

372 N. V. Philips-Duphar
P.O. Box 2
Weesp, The Netherlands

CSI(O)

NEW ZEALAND

373 University of Auckland
Private Bag
Auckland, New Zealand

 $^{106}\text{Ru}(\text{O})$

NORWAY

374 Institute for Atomic Energy
Isotope Laboratories
N-2007
Kjeller, Norway

 $^{127}\text{Xe}(\text{B})^*$

375 Institutt for Atom Energi
OECD Halden Reactor Project
Halden, Norway

EU(P)

SCOTLAND

376 University of Glasgow
Medical Cardiology
Royal Infirmary
Glasgow, Scotland

 $^{28}\text{Mg}(\text{B})^*$

SWEDEN

377 University of Uppsala
Uppsala, Sweden

 $\text{Tgs}(\text{O})$, $^{235}\text{U}(\text{O})$

SWITZERLAND

378 Eidg. Institut for Reaktorforschung
Wurenlingen, Switzerland

 $^{242}\text{Pu}(\text{O})$, $^{99}\text{Tc}(\text{O})$

379 Merz and Bentelli AG
Bumplizstrasse 91
3018 Bern, Switzerland

 $^3\text{H}(\text{O})$

380 Radium-Chemie
A. Zeller and Company
9053 Teufen/Ar
Switzerland

 $^3\text{H}(\text{O})$, $\text{MCP}(\text{O})$, $^{147}\text{Pm}(\text{O})$

TAIWAN

381 United Pacific Semiconductor Corporation
1, San-Chin Street
Su-Lin Cheng, Taipei, Hsien, Taiwan

 $^{85}\text{Kr}(\text{O})$

11. ALPHABETICAL LIST OF ISOTOPES
CROSS-REFERENCED TO CUSTOMER NUMBERS

A. DOMESTIC

Actinium 227 (Ac)	Cadmium 117 (Cd)
Aluminum 28 (Al)	51
51	Calcium 47 (Ca)
Americium 241 (Am)	35, 36, 51, 81, 92, 93, 101, 106, 108, 124, 125, 127, 131, 135, 211, 220, 226, 247, 248, 250, 272, 273, 283, 286, 293
8, 19, 21, 63, 88, 119, 147, 148, 151, 152, 173, 174, 211, 214, 216, 228, 238, 244, 302	Calcium 49 (Ca)
Americium 243 (Am)	51
97, 173, 211, 222, 223, 238, 239, 261, 301	Californium 249 (Cf)
Antimony 122 (Sb)	244
51, 65	Californium 252 (Cf)(S)
Antimony 124 (Sb)	1, 11, 14, 21, 43, 49, 50, 85, 98, 99, 119, 159, 178, 217, 232, 243, 244, 246, 251, 254, 268, 286, 292, 295
51, 65, 107	Californium 252 (Cf)(O)
Astatine 211 (At)	1, 14, 18, 21, 46, 47, 57, 86, 88, 130, 143, 176, 211, 221, 244, 259, 302
73	Cerium 143 (Ce)
Barium 133 (Ba)	51
19, 216, 302	Cerium 144 (Ce)
Barium 140 (Ba)	19, 120, 137, 223, 235
71, 130, 211, 262	Cerium 144 + Praseodymium (CePr)
Berkelium 249 (Bk)	216, 302
11, 19, 211, 233, 238	Cesium 134 (Cs)
Bromine 77 (Br)	216, 302
68, 250, 294	Cesium 137 (Cs)
Bromine 80 (Br)	19, 52, 59, 63, 88, 104, 117, 120, 137, 148, 166, 183, 201, 211, 216, 262, 302
51	Chromium 51 (Cr)
Bromine 82 (Br)	51
51	Chromium 53 (Cr)
Cadmium 109 (Cd)	51
8, 88, 138, 216	

Cobalt 57 (Co)	Gold 198 (Au)
216	6, 51
Cobalt 58 (Co)	Hydrogen 3 (H)
13, 15, 62, 65, 211, 244, 303	7, 8, 19, 21, 26, 38, 69, 79, 95, 96, 121, 125, 137, 148, 157, 167, 177, 179, 181, 199, 211, 227, 238, 251, 278, 298
Cobalt 60 (Co)	
6, 110, 187, 211	Iodine 123 (I)
Curium 243 (Cm)	141, 260, 288
244	Iodine 125 (I)
Curium 244 (Cm)	142
88, 119, 211, 223, 229, 238, 239, 277 301, 302	Iodine 129 (I)
Curium 248 (Cm)	8, 79, 86, 137, 145, 234, 271, 277, 307
11, 52, 233, 238, 244	Iodine 131 (I)
Cyclotron Service Irradiations (CSI)	114, 115, 211, 293
8, 19, 79, 88, 137, 154, 211, 214, 252, 257, 302	Iridium 192 (Ir)
Einsteinium 253 (Es)	16, 60, 82, 148, 186, 201, 269
11, 19, 238, 244	Iron 52 (Fe)
Europium 152 (Eu)	29, 175, 240
19	Iron 55 (Fe)
Europium 154 (Eu)	13
104	Iron 59 (Fe)
Europium 152 + 154 (Eu)	51
104, 222	Krypton 81 (Kr)
Encapsulation (Cap)	4, 31, 93, 306
8, 19, 63, 119, 229, 244	Krypton 85 (Kr)
Fermium 257 (Fm)	1, 3, 5, 7, 19, 23, 24, 30, 33, 37, 39, 40, 53, 55, 56, 58, 66, 78, 80, 84, 88, 89, 117, 122, 126, 134, 137, 148, 155, 168, 176, 182, 184, 197, 204, 205, 210, 211, 213, 221, 224, 296, 297, 302
11 238	
Fluorine 18 (F)	Lanthanum 140 (La)
106, 107, 195, 260	51
Gadolinium 153 (Gd)	Magnesium 28 (Mg)
126, 137, 157, 211, 214, 276, 278	22, 26, 128, 170, 209, 249, 251, 255, 265, 269, 286
Germanium 68 (Ge)	
138	

Manganese 54 (Mn)	Plutonium 238 (Pu)
13, 62, 94, 211, 216, 303	10, 19, 21, 52, 64, 88, 129, 173, 174, 177, 202, 244, 277
Manganese 56 (Mn)	Plutonium 239 (Pu)
13, 15, 51, 65, 244	19, 83, 173, 174, 191, 211, 228, 238, 244, 277, 302
Miscellaneous Compound Preparation (MCP)	Plutonium 240 (Pu)
20, 48, 52, 63, 67, 86, 102, 105, 117, 120, 137, 145, 148, 154, 166, 183, 187, 201, 211, 231, 238, 251, 267, 279, 302	88, 244, 277, 302
Molybdenum 99 (Mo)	Plutonium 241 (Pu)
51	274, 302
Neodymium (Nd)(I)	Plutonium 242 (Pu)
51	11, 52, 263, 302
Neodymium 147 (Nd)	Plutonium 244 (Pu)
41	17, 19, 21, 52, 238, 244, 274, 277
Neodymium 149 (Nd)	Polonium 210 (Po)
51	118, 228
Neodymium 151 (Nd)	Potassium 42 (K)
51	51
Neptunium (Np)	Potassium 43 (K)
11, 211, 302	131, 255, 280
Neptunium 237 (Np)	Praseodymium 142 (Pr)
11, 17, 70, 88, 130, 176, 223, 254, 264, 302	51
Nickel 63 (Ni)	Promethium 147 (Pm)
137	19, 88, 137, 215, 228, 302
Niobium 95 (Nb)	Protactinium 231 (Pa)
11, 19, 117, 211, 270	19, 211
Phosphorus 33 (P)	RaDEF
79, 137	19, 174
Plutonium (Pu)	Reactor Service Irradiations (RSI)
42, 100, 173, 174, 211, 233, 238, 302	9, 44, 61, 87, 90, 164, 236, 245
Plutonium 236 (Pu)	Rubidium 81 (Rb)
1, 11, 18, 19, 47, 52, 71, 97, 173, 222, 223, 228, 261, 302	28
	Ruthenium 103 (Ru)
	21, 71, 117, 137, 290

Ruthenium 106 (Ru)

8, 11, 79, 88, 120, 211, 216, 253,
266, 302

Ruthenium 103 (Ru)

21, 71, 117, 137, 290

Samarium 151 (Sm)

74, 137, 211

Samarium 153 (Sm)

51

Selenium 77 (Se)

51

Selenium 79 (Se)

51

Selenium 81 (Se)

51

Silver 109 (Ag)

51

Silver 110 (Ag)

51

Sodium 22 (Na)

138, 302

Sodium 24 (Na)

51, 94

Special Services (SS)

1, 18, 19, 20, 47, 52, 59, 86, 126,
154, 158, 210, 211, 214, 221, 233, 238,
244, 276, 278, 302, 305

Strontium 82 (Sr)

106, 233, 237, 246

Strontium 85 (Sr)

106, 216, 233, 237, 246

Strontium 89 (Sr)

32, 136, 156, 157, 175, 180, 195,
211, 247, 248, 277

Strontium 90 (Sr)

67, 79, 88, 137, 215, 241

Strontium 90 - Yttrium (SrY)

19, 174, 228, 302

Tantalum 182 (Ta)

13, 15

Target Preparation, Radioisotope (Tgs)

1, 8, 11, 14, 17, 19, 21, 26, 46, 52,
63, 83, 88, 91, 96, 130, 157, 173, 176,
187, 196, 200, 211, 214, 238, 244, 254,
259, 263, 264, 277, 298, 299, 302

Technetium (Tc)

176

Technetium 99 (Tc)

11, 19, 70, 108, 137, 149, 154, 176, 194
211, 233, 254, 275, 281

Thorium 229 (Th)

211, 305

Thorium 230 (Th)

11, 211, 213, 225, 302

Thorium 232 (Th)

11, 21, 211, 299, 302

Thorium 234 (Th)

211

Thorium (Th)(P)

216, 302

Thulium 170 (Tm)

19

Uranium-Depleted (DU)

2, 11, 54, 76, 77, 123, 132, 150, 173,
174, 176, 214, 216, 218, 219, 302

Uranium-Enriched (EU)

51, 54, 70, 132, 214, 216, 302

Uranium-Natural (RW)

18, 19, 103, 228, 302

Uranium 232 (U)

18, 102, 256

Uranium 233 (U)

11, 17, 52, 102, 139, 169, 174, 203,
211, 214, 238, 254, 299, 302

Uranium 234 (U)

63, 171, 233, 300, 302

Uranium 235 (U)

11, 25, 63, 91, 130, 139, 196, 211, 214,
238, 264, 299, 302

Uranium 236 (U)

211, 244, 305

Uranium 238 (U)

7, 11, 17, 153, 176, 206, 211, 212,
244, 269, 300, 302

Withdrawn Radioisotopes (RW)

16, 60, 82, 137, 148, 186, 201

Xenon 127 (Xe)

12, 27, 34, 35, 45, 72, 88, 93, 104,
108, 111, 118, 129, 131, 133, 135, 138,
140, 141, 144, 146, 165, 172, 235, 242,
250, 272, 275, 276, 282, 288, 289, 291

Xenon 128 (Xe)

12

Xenon 133 (Xe)

1, 3, 46, 75, 104, 109, 112, 113, 116,
130, 137, 160, 161, 162, 163, 185, 188,
189, 190, 192, 193, 198, 207, 208, 211,
213, 220, 230, 239, 243, 258, 259, 272,
274, 277, 279, 281, 284, 285, 287, 293,
304

Yttrium 91 (Y)

11, 22, 88, 131

Zinc 65 (Zn)

216

Zirconium 95 (Zr)

1, 11, 19, 71, 88, 120, 137, 211, 222

B. FOREIGN

Americium 241 (Am)

313, 360

Americium 243 (Am)

311

Argon 37 (Ar)

363

Barium 140 (Ba)

347

Californium 252 (Cf)(O)

332, 334, 335, 361

Cerium 144 (Ce)

341

Cesium 137 (Cs)

321

Curium 244 (Cm)

309, 341, 345, 360

Cyclotron Service Irradiations (CSI)

372

Encapsulation (Cap)

318, 341, 348, 354, 360

Gadolinium 153 (Gd)

341, 347

Hydrogen 3 (H)

320, 332, 338, 339, 341, 342, 344,
346, 379, 380

Iodine 129 (I)

325, 329, 352

Krypton 85 (Kr)

319, 327, 341, 364, 365, 381

Magnesium 28 (Mg)

317, 328, 334, 335, 367, 376

Miscellaneous Compound Preparation (MCP)

321, 341, 368, 369, 380

Neptunium 237 (Np)

313, 314, 318, 358, 360, 366

Plutonium 236 (Pu)

315, 355, 362

Plutonium 238 (Pu)

348, 354

Plutonium 239 (Pu)

314, 316

Plutonium 240 (Pu)

315

Plutonium 241 (Pu)

315, 354

Plutonium 242 (Pu)

311, 315, 316, 343, 348, 351, 353, 378

Plutonium 244 (Pu)

350

Promethium 147 (Pm)

341, 368, 369, 380

Ruthenium 106 (Ru)

373

Special Services (SS)

347

Strontium 89 (Sr)

341

Target Preparation Radioisotopes (Tgs)

309, 313, 314, 332, 345, 355, 358, 366,
377

Technetium 99 (Tc)

341, 356, 378

Thorium 230 (Th)

322, 351

Thorium 232 (Th)

313

Uranium-Enriched (EU)

343, 371, 375

Uranium 233 (U)

308, 313, 316, 351

Uranium 234 (U)

311, 343, 370

Uranium 235 (U)

313, 314, 320, 333, 343, 377

Uranium 236 (U)

357

Uranium 238 (U)

313, 314, 343, 354, 355

Xenon 127 (Xe)

309, 310, 312, 323, 326, 328, 331, 334,
336, 337, 340, 359, 374

Xenon 133 (Xe)

324, 330, 332, 336

Yttrium 91 (Y)

341

Zirconium 95 (Zr)

341

111. ALPHABETICAL LIST OF STATES AND FOREIGN COUNTRIES
CROSS-REFERENCED TO CUSTOMER NUMBERS

Alabama (AL)

230, 265, 281

Arizona, (AZ)

7, 14, 122, 231

Arkansas (AR)

232,

California (CA)

2, 15, 23, 25, 38, 39, 48, 53, 55,
58, 63, 65, 71, 78, 80, 82, 83, 85
88, 89, 101, 120, 121, 127, 134, 135,
147, 161, 163, 168, 169, 180, 182, 183,
189, 193, 197, 199, 210, 220, 226, 233,
234, 235, 236, 237, 238, 239, 240, 241,
242, 243, 244, 264, 267, 268, 282, 283

Colorado (CO)

30, 96, 109, 116, 155, 162, 173, 217,
284

Connecticut (CT)

146, 178, 229, 249, 306, 307

District of Columbia (DC)

68, 130, 201

Florida (FL)

57, 64, 285

Georgia (GA)

67

Hawaii (HI)

160

Idaho (ID)

1, 6, 12, 13, 41, 51

Illinois (IL)

8, 9, 11, 33, 44, 61, 113, 125, 144,
145, 175, 198, 221, 245, 246, 247, 248,
252, 286

Indiana (IN)

40, 81, 111, 164, 224

Iowa (IA)

86, 87, 128

Kansas (KA)

250, 293

Kentucky (KY)

251

Louisiana (LA)

60, 186, 192, 208, 209, 257

Maine (ME)

56

Maryland (MD)

126, 93, 129, 131, 133, 202, 218, 219,
253

Massachusetts (MA)

28, 84, 95, 106, 107, 136, 137, 138,
150, 187, 201, 288, 297, 305

Michigan (MI)

50, 254, 298, 304

Minnesota (MN)

76, 77, 108, 117, 118, 191

Mississippi (MS)

255

Missouri (MO)

72, 92, 104, 190, 204, 293, 294, 295

Nebraska (NB)

36, 256

Nevada (NV)

225

New Hampshire (NH)

105

New Jersey (NJ)

3, 20, 34, 36, 45, 69, 90, 110, 166

New Mexico (NM)

47, 100, 102, 176, 177, 244

New York (NY)

4, 21, 31, 35, 74, 97, 123, 125, 139
151, 167, 170, 179, 181, 194, 195, 196,
215, 263, 289, 300

North Carolina (NC)

27, 46, 99, 140, 141

Oregon (OR)

159, 203, 258

Ohio (OH)

17, 18, 26, 29, 70, 79, 119, 120, 125,
132, 156, 171, 185

Oklahoma (OK)

32, 158, 188

Pennsylvania (PA)

10, 16, 49, 62, 98, 114, 115, 153,
227, 259, 260, 261, 296, 299, 301, 303

Rhode Island (RI)

22, 262

South Carolina (SC)

52, 172, 266

Tennessee (TN)

149, 154, 211, 212, 213, 214, 269
270, 287, 291

Texas (TX)

59, 112, 143, 148, 152, 165, 205, 206
207, 271, 272, 279, 292

Utah (UT)

184, 274

Virginia (VA)

43, 66, 200, 223, 275, 276

Washington (WA)

19, 21, 54, 75, 91, 94, 174, 216, 222,
228, 233, 277, 290, 302

Wisconsin (WI)

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Argentina

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Australia

309, 310, 311, 312

Austria

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Belgium

314, 315, 316, 317, 318, 319

Canada

235, 320, 321, 322, 323, 324, 325,
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Denmark

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England

338, 339, 340, 341, 342, 343, 344,
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Germany, Federal Republic of

349, 350, 351, 352, 353, 354, 355, 356,
357, 358, 359, 360, 361, 362, 363

Hong Kong

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Israel

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Japan

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Norway

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Scotland

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Sweden

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Switzerland

378, 379, 380

Taiwan

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IV. RADIOISOTOPE SALES AND TRANSFERS - FY 1978.

	Domestic			Foreign			Project			Total		
	Shipments	Amount mCi	Dollars	Shipments	Amount mCi	Dollars	Shipments	Amount mCi	Dollars	Shipments	Amount mCi	Dollars
aluminum-28 (I)							35	1.567 μ C	80	26	85	30
americium-241 (H)							26	1.567 μ C		26	1.567 μ Ci	
americium-241 (O)	71	1.429270 kg	965622	1	217 g	50	34	25.080 g	6628	106	1.454567 kg	372500
americium-241 (P)							1	7 g		1	7 g	
americium-241 (S)	3		495	1		65	3	1.105 kg		3	1.105 kg	
americium-243 (O)	1	175000 Ci	90000	2	25000 Ci	100000	3	565.8 mg	845	12	565.8 mg	1505
antimony-122 (I)(a)	1	25000	(a)	2	5000 Ci	a)		70000	19500	3	770000 Ci	409500
antimony-124 (I)	1	50.0		2				10000	(a)	3	110000 Ci	(a)
antimony-124 (B)	1			1	.0	.0				1	50.0	
argon-37 (O)										1	1.0	50
astatine-211 (B)	25	52								25	52	
barium-133 (H)							5	1.3374		6	0.3374	
barium-140 (O)	4	12.0	95	3	0	5	2	4.0	50	9	26	220
berkelium-249 (O)							9	33.9 μ g	640	9	33.9 μ g	540
bromine-77 (L)	3	255								3	255	
bromine-80 (I)								230	40		230	40
bromine-82 (I)								36.3	60		36.3	60
cadmium-109 (H)							2	0.40 μ Ci		2	0.40 μ Ci	
cadmium-109 (B)(b)	11	4611.1	25511.52							11	4611.1	25511.51
cadmium-117 (I)								0.3	m		0.3	20
calcium-47 (I)								3×10^{-6}	m		3×10^{-6}	m
calcium-47 (O)	232	178.7	19456				13	1.7	500	245	180.5	19956
calcium-49 (I)							20	8 μ Ci			8 μ Ci	20
californium-249 (O)							3		250	3		250
californium-250 (O)	65		55							65		65
californium-252 (O)	12	8.3 μ g	380	4		100	9	95.5 μ g	915	25	103.9 μ g	2195
californium-252 (P)							1	8 mg	100	1	8 mg	1a,
californium-252 (S)	7	13.5 mg	158068	7	5.7 mg	197653				14	29.2 mg	355721
cerium-143 (I)							4		m		4	m
cerium-144 (O)	4	111.0	250	3	00.0	10	2	30.0	200	9	341.0	500
cerium-144 + praseodymium (H)							8	48.90 μ C		8	48.90 μ Ci	
cesium-134 (H)							3	1.1004		3	1.1004	
cesium-137 (H)							39	2.41		39	2.41	
cesium-137 (O)	30	68.0943985 kCi	5176	2			3	5.897 Ci	258	35	68.1002955 kCi	8434
chromium-51 (I)								3 μ Ci	20		3 μ Ci	m
chromium-53 (I)								6 μ Ci	20		6 μ Ci	m
cobalt-57 (H)							2	0.40 μ Ci		2	0.40 μ Ci	
cobalt-58 (H)	4	11.6 μ Ci					10	206.1 μ C		14	217.7 μ Ci	
cobalt-60 (I)								40	20		40	m
cobalt-60 (O)	2	25.0	100				4	0.1		6	25.1	100
curium-243 (O)							1		65	1		65
curium-244 (H)							1	0.65 μ Ci		1	0.65 μ Ci	
curium-244 (O)	8	9.5 mg	1560	4	66.0 mg	17080	5	51.370 g	590	17	11.5455 g	19230
curium-248 (O)							5	23.9 μ g	325	5	23.9 μ g	325
cyclotron service (C) irradiations (E)	6		2268.35							6		2268.35
cyclotron service (C) irradiations (O)	58		318448	5		1207	12		19611	75		347266

IV. RADIOISOTOPE SALES AND TRANSFERS - FY 1978. (continued)

	Domestic			Foreign			Project			Total		
	Shipments	Amount mCi	Dollars	Shipments	Amount mCi	Dollars	Shipment	Amount mCi	Dollars	Shipments	Amount mCi	Dollars
depleted uranium (P)	19	1888 kg	3774				47	1249 kg	1308	56	6137 kg	
einsteinium-253 (O)							4	0.4 mg	260	4	0.4	
enriched uranium (P)	26	125.307 kg	1065080	3	10.261 kg	137180	33	70.740 kg	601260	62	206.308 kg	175352
encapsulation (O)			31480			42400	4		22799	4		146679
europium-152 (H)							1	0.1 μ Ci		1	0.1 μ Ci	
europium-152 (O)	1	1500.0	30				1	10.0	200	2	1510.0	
fermium-257 (O)							2		130	2		130
fluorine-18 (8)	8	m7.5								8	207.5	
gadolinium-153 (O)	5	3601.0	3850	5	2160.0	2160	2	2002.0	2250	12	7763.0	8260
germanium-68 (B)	2	150.0								2	150.0	
gold-198 (I)								133	40		133	40
iodine-123 (E)	14	780.3								14	780.3	
iodine-125 (8)	1	2.0								1	2.0	
iodine-129 (O)	20	11.6855 g	10042	41	11.851 g	1901	1	201.0 mg	210	25	13.7465 g	12153
iodine-131 (O)	6	754.0	775				79	1231.5	18915	85	1985.5	19690
iridium-192 (O)	1	1.0	25							1	1.0	25
iridium-192 meta (O)	160	722.241 kCi	1069341							160	722.241 kCi	106934
iron-52 (L)	1	30								1	30	
iron-52 (B)	3	88								3	88	
iron-55 (H)							3	265.1		3	265.1	
iron-59 (I)								0.1 μ Ci	20		0.1 μ Ci	m
krypton-81 (B)	124	3275.0								124	3275.0	
krypton-85 enriched (O)	1	25 Ci	1500							1	25 Ci	1500
krypton-85 (O)	144	4.8647001 kCi	107084	16	971 Ci	21362	42	5.1461825 Ci	56286	202	10.9818826 kCi	194732
lanthanum-140 (I)								3.6	40		3.6	40
magnesium-28 (B)(b)	37	18.0	6370	10	42	1813				47	22.2	8183
manganese-54 (H)	2	3.3 μ Ci					15	452.3 μ Ci		17	455.5 μ Ci	
manganese-56 (H)	3	8.3 μ Ci					4	65.1 μ Ci		7	73.4 μ Ci	
manganese-56 (I)								46.4	180		46.4	180
miscellaneous compound preparations (O)	30	290.0	1144				10	10.0	2600	40	300.0	3744
molybdenum-99 (I)								24	120		2.4	120
natural uranium (H)							29	18.5003 g		29	18.5003 g	
natural uranium (P)	4						3			7		
neodymium-147 (I)								5	40		5	40
neodymium-149 (I)								1.5	40		1.5	40
neodymium-151 (I)								1.5	40		1.5	40

IV. RADIOISOTOPE SALES AND TRANSFERS - FY 1978. (continued)

	Domestic			Foreign			Project			Total		
	Shipments	Amount nCi	Dollars	Shipments	Amount nCi	Dollars	Shipments	Amount nCi	Dollars	Shipments	Amount	Dollars
neptunium (P)							2	70 g	1750		70 g	1750
neptunium-237 (H)	1	1.2 μ Ci			0.715 g	1492	8	156.2463 g	29424		1.2 μ Ci	
neptunium-237 high purity (O)	1	0.375 g	1262								170.3363 g	34178
neptunium-237 metal (O)	1	2 g	515				1	264.0 mg	258		2.264 g	773
neptunium-237 oxide (O)	1		165		0 g	1370	3	623 mg	195		10.623 g	2730
nickel-63 (O)	2	16 Ci	6800								1.6 Ci	5800
nobelium-95 (O)	35	125	15625				5	17.7	442		642.7	16067
phosphorus-33 (O)	29	2147 Ci	24095				29	5.655 kg	292860		2.147 Ci	24095
plutonium (P)						1695	9		5846		6.655 kg	292860
plutonium-236 (O)	3		4257			1165	4		260			14798
plutonium-237 (O)	3		2645				1	28.0 nCi			28.0 nCi	5070
plutonium-238 (H)							20	14.5838 kg			14.5838 kg	
plutonium-238 (M)	1	57.609 g	75086		06.810 g	187757	1		120		160.799 g	262963
plutonium-238 (O)	1											
plutonium-238 (P)							11	9.76 kg			9.76 kg	
plutonium-238 (S)							138	4.13823 μ Ci			4.13823 μ Ci	
plutonium-239 (H)							5	5.963 kg			6.963 kg	
plutonium-239 (M)							19	73.7421 g	1632		86.2991 g	4861
plutonium-239 (O)	2	386 mg	1144		2.171 g	2085	1	1.1 μ Ci			1.1 μ Ci	
plutonium-240 (H)							6	26.135 g	550		92.656 g	1238
plutonium-240 (O)	2	56.4216 g	269		00 mg	119	1	10.0 mg	65		173.0 mg	1586
plutonium-241 (O)	1	130 mg	168		50.0 mg	1353	3	6.5781 g	195		7.0824 g	10041
plutonium-242 (O)	1		65	3	34.3 mg	3781	4	1.1453 g	260		1.1473 g	360
plutonium-244 (O)	1	20 mg	100				3	18.0 pCi			18.0 pCi	
polonium-210 (H)							1	12.0			12.0	
polonium-210 (M)								1.7	40		1.7	40
potassium-42 (I)								3.1	20		0.1	20
potassium-43 (O)	7	560	5600				6	5.57 nCi			5.57 nCi	
praseodymium-142 (I)											17.6105 kCi	18490
promethium-147 (H)					7.57 kCi	17570	1	243.0 mg			243.0 mg	
promethium-147 (O)	12	40.5 Ci	920				1	50.0 mg	797		50.0 mg	797
protactinium-231 (M)												
protactinium-231 (O)												
RaDEF (H)(d)							4	22.6 nCi			22.6 nCi	13933.29
reactor service irradiations (B)	31		13933.29									
reactor service irradiations (I)								278	9409		278	9409
rubidium-81 (B)	9	49.5									49.5	
ruthenium-103 (B)	13	32									3.2	
ruthenium-103 (O)	4	40	1000				7	46.3	1157		86.3	2157
ruthenium-106 (H)							2	0.40 μ Ci			0.40 μ Ci	
ruthenium-106 (O)	22	588.3	17225		.0	15	4	15.0	375		704.3	17625

IV. RADIOISOTOPE SALES AND TRANSFERS - FY 1978. (continued)

	Domestic			Foreign			Project			Total		
	Shipment	Amount mCi	Dollars	Shipments	Amount mCi	Dollars	Shipments	Amount mCi	Dollars	Shipments	Amount mCi	Dollars
samarium-151 (O)	1	30.0 mg	1080				1	1.4 g	100	2	1.43 g	1180
samarium-153 (I)								20	20		20	20
selenium-77 (I)								90	90		90	20
selenium-79 (I)								10	20		10	20
selenium-81 (I)								25	20		25	20
silver-108 (I)								20	10		20	40
silver-110 (I)								200	20		200	60
sodium-22	1	418.0								1	418.0	
sodium-22 (H)							1	0.49		1	0.49	
sodium-24 (H)							1	10.0 μ Ci		1	10.0 μ Ci	
sodium-24 (I)								6.2	30		6.2	80
special services (O)(e)			158433			100			1499			203923
strontium-82 (L)	5	249					2	0.40 μ Ci		5	249	
strontium-85 (H)										2	0.40 μ Ci	
strontium-85 (L)	5	990								5	990	
strontium-89 (O)	31	334.0	4555	2	25.0	137	1	2.0	27	34	361.0	4919
strontium-90 (O)	19	24.285 Ci	131							19	24.285 Ci	131
strontium-90, yttrium (H)							76	35		76	35	
tantalum-182 (H)	1	10 μ Ci					1	0.1 μ Ci		2	10.1 μ Ci	
target preparations (O)			65662			16910	3		4892	3		581848
technetium-99 (O)	11	38.55 g	2156	5	25.7 g	1463	11	27.026 g	1681	27	91.276 g	5300
thorium (P)							12	1 kg		12	1 kg	
thorium-229 (M)							3	25.9 mg		3	25.9 mg	
thorium-229 (O)	1		65							1		65
thorium-230 (M)							3	75.374 g		3	75.374 g	
thorium-230, 80-90 (O)				1	100 mg	195				1	10.0 mg	295
thorium-230, >90 (O)	1	2.0 mg	259	1	100.0 mg	1827	3	107.0 mg	333	5	209.0 mg	10919
thorium-232 (O)					1000 mg	10	13	14.8672 g	382	13	14.6972 g	692
thulium-170 (U)	3	42,000	750							3	42,000	750
tritium (M)				2	2000		1	0.08 μ Ci		3	2000	
tritium (O)	250	1294.026760 kCi	993866	48	976.05 kCi	736880	22	1.1423389 kCi	1790	320	2271.2190989 kCi	1732537
tritium (P)							1	0.02 g		1	0.02 g	
uranium-232 (O)	2		330				1	200.0 mg	120	3	200.0 mg	450
uranium-233 (O)	5	2.7622 g	7451	3	1.3 g	1549	17	74.8286 g	1162	25	78.8908 g	12162
uranium-233 (P)							3	100 g	3100	3	100 g	9100
uranium-234 (M)							1	21.238 g		1	21.238 g	
uranium-234 (O)	4	3.7 g	31044	3	330.0 mg	2940	2	30.0 mg	257	9	4.06 g	34241
uranium-235 (M)							1	1.4		1	1.4	
uranium-235 (O)	17	17.58516 kg	64826	5	56.642 g	1975	16	2.2626 g	378	38	18.174206 kg	67679
uranium-236 (O)	1	5.0 mg	67	1	500.0 mg	170	2		130	4	505.0 mg	467
uranium-238 (M)							10	1.7894 kg		10	1.7894 kg	
uranium-238 (O)	3	182.085 g	939	4	16.525 g	1831	16	6.5703 g	1011	23	205.1803 g	3781

IV. RADIOISOTOPE SALES AND TRANSFERS - FY 1978. (continued)

	Domestic			Foreign			Project			Total		
	Shipments	Amount mCi	Dollars	Shipments	Amount mCi	Dollars	Shipments	Amount mCi	Dollars	Shipments	Amount mCi	Dollars
withdrawn radio-isotopes	9	34.197930 kCi	50999							9	34.197930 kCi	50999
xenon-127 (B)(b)	200	37560.4	60561	48	11653.9	18837				248	49214.3	79398
xenon-128 (I)								2216 cc	151395		2216 cc	151395
xenon-133 (O)	1000	8.313201 kg	545215	91	94 g	7625	18	13.120 g	1555	1109	8.420321 kg	554395
yttrium-91 (O)	3	13.0	143	1	14.0	154	1	3.0	33	5	3.0	330
zinc-65 (H)							2	0.42 μ Ci		2	0.42 μ Ci	
zirconium-95.	7	95.0	522	10	185.0	1017	8	44.0	273	25	324.0	1812
niobium-95 (O)												
Totals	2951		6001518.16	338		1727788	1045		1825743	4334		9555049.16

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P = Battelle, Pacific Northwest Laboratories

B = Brookhaven National Laboratory

H = Hanford Engineering Development Laboratory

I = Idaho Operations Office

M = Mound Facility

O = Oak Ridge National Laboratory

S = Savannah River Plant

U = UNC Nuclear Industries, Inc.

(a) Dollar totals included with antimony-122 (I)

(b) Billed through Oak Ridge

(c) Radioisotopes produced by cyclotron service irradiations: ^{113m}Ba , $^{105,206,207}\text{Bi}$, ^{11}C , $^{129,134}\text{Cs}$, $^{56,57,61}\text{Co}$, ^{64}Cu , $^{149,150,151}\text{Eu}$, ^{18}F , $^{67,69,70}\text{Ga}$, $^{67,68}\text{Ge}$, ^{197}Au , ^{172}Hf , ^{111}In , ^{123}I , ^{171}Lu , ^{112}Pm , ^{189}Re , ^{189}Re , ^{95}Rh , $^{81,84}\text{Rb}$, $^{95\text{m},99}\text{Tz}$, ^{166}Tm .

(d) $^{210}\text{Po} \rightarrow ^{210}\text{Bi} \rightarrow ^{210}\text{Pb}$

(e) Special services include such items as target fabrication, source encapsulation, and preparation of special chemical forms.

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