

DOE Occupational Radiation Exposure Report for CY 2018

Exhibit A-1. Labor Categories and Occupation Codes.

The following is a list of the Occupation Codes that are reported with each individual's dose record to the DOE Radiation Exposure Monitoring System (REMS) in accordance with DOE Order 231.1B. Occupation Codes are grouped into Labor Categories for the purposes of analysis and summary in this report. The occupation codes are listed in the REMS Reporting Guide, Table G-7, and represent a subset of the occupations listed in the Department of Commerce's Standard Occupational Classification (SOC) Manual (1980).

Labor Category	Occupation Code	Occupation Name
Agriculture	562	Groundskeepers
	570	Forest Workers
	580	Misc. Agriculture
Construction/Repair	610	Mechanics/Repairers
	641	Masons
	642	Carpenters
	643	Electricians
	644	Painters
	645	Pipe Fitter
	650	Miners/Drillers
	660	Misc. Repair/Construction
Laborers	850	Handlers/Laborers/Helpers
Management	110	Manager - Administrator
	400	Sales
	450	Admin. Support and Clerical
Misc.	910	Military
	990	Miscellaneous
Production	681	Machinists
	682	Sheet Metal Workers
	690	Operators, Plant/System/Utility
	710	Machine Setup/Operators
	771	Welders and Solderers
	780	Misc. Precision/Production
Professional	160	Engineer
	170	Scientist
	184	Health Physicist
	200	Misc. Professional
	260	Doctors and Nurses
Service Workers	512	Firefighters
	513	Security Guards
	521	Food Service Employees
	524	Janitors
	525	Misc. Service
Technicians	350	Technicians
	360	Health Technicians
	370	Engineering Technicians
	380	Science Technicians
	383	Radiation Monitors/Techs.
	390	Misc. Technicians
Transport Workers	820	Truck Drivers
	821	Bus Drivers
	825	Pilots
	830	Equipment Operators
	840	Misc. Transport
Unknown	001	Unknown

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Exhibit A-2. Organizations Reporting to DOE REMS, 2014–2018.

The following is a list of all organizations reporting to the DOE REMS from 2014–2018.

The list provides the Site groupings used in this report as well as the organization reporting code and name.

Site	Org. Code	Organization Name	2014	2015	2016	2017	2018
Albuquerque	OST3100	Office of Secure Transportation	●	●	●	●	●
Ames Laboratory	1000503	Ames Laboratory (Iowa State)	●	●	●	●	●
Argonne National Laboratory (ANL)	1000703	Argonne National Laboratory	●	●	●	●	●
	1004031	New Brunswick Laboratory	-	-	●	-	-
Brookhaven National Laboratory (BNL)	1001003	Brookhaven National Laboratory	●	●	●	●	●
DOE Headquarters	1504001	DOE Headquarters	●	●	●	●	●
Energy Technology Engineering Center	8001003	Boeing North America, Inc. - Research	●	-	-	-	-
	8002001	Cabrera Services	-	●	●	●	●
Fermi National Accelerator Lab. (FERMI)	1002503	Fermilab	●	●	●	●	●
Grand Junction Site	3260615	Navarro Research and Engineering	-	-	-	●	●
Hanford	4700805	Bechtel National Corporation	●	●	●	●	●
	4701001	DOE, Office of River Protection	●	●	●	●	●
	4702004	Advance Technology Laboratories	●	●	●	-	-
	4702005	Wastren Advantage, Inc.	-	●	●	●	●
	4707104	Washington River Protection Solutions, LLC	●	●	●	●	●
	NA-2000	NNSA - Visitors	●	●	●	●	●
	NA-2100	NNSA - Management and Support Personnel	●	●	●	●	●
	NA-2101	NNSA - Mgmt. & Support Personnel: MELE Assoc.	●	●	●	●	●
	NA-2110	NNSA - North and South America	●	●	●	●	●
	NA-2120	NNSA - Europe, Africa and the Middle East	●	●	●	●	●
	NA-2130	NNSA - Asia and Members of the Former Soviet	●	-	●	-	-
	7500503	Battelle - PNNL	●	●	●	●	●
	7500504	Battelle -PNNL- Subs	●	●	●	●	●
	7500521	Pacific Northwest Site Office	●	●	●	●	●
	7500605	Washington Closure Hanford	●	●	●	-	-
	7502504	HPMC Occupational Medical Services	●	●	●	●	●
	7505214	Mission Support Alliance (MSA)	●	●	●	●	●
7505304	CH2M Hill Plateau Remediation Company	●	●	●	●	●	
7506001	DOE-Richland Field Office	●	●	●	●	●	
Idaho Site	3004001	Idaho Field Office	●	●	●	●	●
	3004404	BBWI Service Subs	●	●	-	-	-
	3005003	INL - BEA, LLC - Research	●	●	●	●	●
	3005004	INL - BEA, LLC - Services	●	●	●	●	●
	3005009	INL - BEA, LLC - Security	●	●	●	●	●
	3005012	INL - BEA, LLC - Production	●	●	●	●	●
	3006002	INL - CWI - Projects	●	●	-	-	-
	3006002	INL - Fluor- Projects	-	-	●	●	●
	3006004	ICP - CWI - Subcontractors	●	●	-	-	-
	3006004	ICP - Fluor - Subcontractors	-	-	●	●	●
	3006005	ICP - CWI - Support	●	●	-	-	-
	3006005	ICP - Fluor - Support	-	-	●	●	●
	3006016	ICP - CWI - Construction Subs	●	●	-	-	-
3006016	ICP - Fluor - Construction Subs	-	-	●	-	-	
Kansas City Plant	0531002	Honeywell FM & T/KC Production	●	●	-	-	-
Kansas City National Security Campus	0531002	Honeywell FM & T	-	-	●	●	●

Site	Org. Code	Organization Name	2014	2015	2016	2017	2018
Lawrence Berkeley National Lab. (LBNL)	8003003	Lawrence Berkeley National Laboratory	●	●	●	●	●
Lawrence Livermore National Lab. (LLNL)	0580403	Lawrence Livermore National Laboratory	●	●	●	●	●
	0580416	LLLNL - Construction Subcontractors	-	-	-	-	●
	0580503	LLNL - Nevada	-	-	●	●	●
	0580701	LLNL - DOE Site Office	●	●	●	●	●
Los Alamos National Lab. (LANL)	0540001	NNSA Los Alamos Site Office	●	●	●	●	●
	0544003	Los Alamos National Laboratory	●	●	●	●	●
	0544006	Los Alamos National Lab Construction Subs	-	-	-	●	●
	0544809	Protection Technologies Los Alamos	●	●	●	●	-
	0544904	Johnson Controls, Inc.	●	●	●	●	●
	1530001	Newport News Nuclear BWXT Los Alamos (N3B)	-	-	-	-	●
National Renewable Energy Laboratory	2806003	National Renewable Energy Laboratory	●	●	●	●	●
Nevada National Security Site	0501001	NNSA Service Center	●	●	●	●	●
	0520001	NNSA Nevada Site Office	●	●	●	●	●
	0521104	Bechtel Nevada - Amador Valley	●	●	●	-	-
	0521104	MSTS - Livermore Operations	-	-	-	●	●
	0521204	Bechtel Nevada - Las Vegas	●	●	●	-	-
	0521204	MSTS - Las Vegas	-	-	-	●	●
	0521304	Bechtel Nevada - Los Alamos	●	●	●	-	-
	0521304	MSTS - Los Alamos	-	-	-	●	●
	0521314	NSTec - Sandia	-	-	-	●	-
	0521405	Bechtel Nevada - NTS	●	●	●	-	-
	0521405	MSTS - NTS	-	-	-	●	●
	0521416	Bechtel Nevada - NTS - subcontractors	●	●	●	-	-
	0521416	MSTS - NTS subcontractors	-	-	-	●	●
	0521503	Bechtel Nevada - Special Tech Lab.	●	●	●	-	-
	0521503	MSTS - Special Tech. Lab	-	-	-	●	●
	0528002	Centerra-Nevada	●	●	●	-	-
	0528004	Centerra-Nevada Subcontractors Lockheed	●	●	●	-	-
	0529004	Nevada	-	-	-	●	●
	0529009	Wackenhut Services Inc. - NV	-	-	-	●	●
	3505104	Navarro-Intera LLC	●	●	●	●	●
	3508004	Nye County Sheriff - NSTec	●	●	●	●	-
	3508703	SAIC - NV	-	-	-	●	-
	9708001	USGS - Yucca	-	-	-	●	●
New Brunswick Laboratory	1004031	New Brunswick Laboratory - Research	●	●	●	-	-
Oak Ridge Site	4003602	UT-Battelle: ORNL-Isotek	●	●	●	●	●
	4004203	Oak Ridge Inst. For Science & Educ. (ORISE)	●	●	●	●	●
	4004602	Wastren Advantage, Inc.	●	●	-	-	-
	4004602	Tru Waste Processing Center - ORNL	-	-	●	●	●
	4005104	USEC: Oak Ridge, K25	●	●	●	-	-
	4006002	UCOR - ETPP	●	●	●	●	●
	4006503	UT-Battelle - ORNL	●	●	●	●	●
	4006510	UCOR - ORNL	●	●	●	●	●
	4007509	National Strategic Protective Services	●	●	●	●	●
	4008010	UCOR- Y-12	●	●	●	●	●
	4018102	CNS, LLC, Y-12	●	●	●	●	●
Paducah Gaseous Diff. Plant (PGDP)	4007002	Swift & Staley Team	●	●	●	●	●
	6203004	LATA Environmental Services	●	●	-	-	-
	6203106	B&W Conversions Services, LLC	●	●	-	-	-

Site	Org. Code	Organization Name	2014	2015	2016	2017	2018
	6203106	DUF6 Paducah Construction Subs - MACS	-	-	●	●	●
	6503304	Fluor Paducah Deactivation Project	-	-	●	-	-
	6503304	Four Rivers Nuclear Partnership	-	-	-	●	●
Pantex Plant (PP)	0510001	CNS Pantex - NNSA and DOE Couriers	●	●	●	●	●
	0514004	Battelle - Pantex	●	●	●	●	●
	0515002	CNS Pantex	●	●	●	●	●
	0515006	CNS Pantex - Construction Subs	●	●	●	●	●
	0515009	CNS Pantex - Security	●	●	●	-	●
Portsmouth Gaseous Diff. Plant (PORTS)	6202106	Uranium Disposition Services - Portsmouth Sub	●	●	-	-	-
	6202106	DUF6 Portsmouth Construction Subs - MACS	-	-	●	●	●
	6202204	Wastren - Portsmouth Services	●	●	-	-	-
	6202204	Portsmouth Mission Alliance (PMA)	-	-	●	●	●
	6202304	Fluor B & W Portsmouth	●	●	●	●	●
Princeton Plasma Physics Laboratory	1005003	Princeton Plasma Physics Laboratory	●	●	●	●	●
Sandia National Laboratories (SNL)	0578003	Sandia National Laboratories	●	●	●	●	●
Savannah River	0595112	Tritium Extractopm Facility	-	-	●	●	●
	8500505	Bechtel Construction - SR	●	●	●	●	●
	8500516	Miscellaneous SRS Construction Subs	●	●	●	●	●
	8501042	SRR Operations	●	●	●	●	●
	8501044	SRR Service Subs	●	●	●	●	●
	8505501	Savannah River Field Office	●	●	●	●	●
	8505504	Misc. DOE Contractors - SR	●	●	●	●	●
	8505525	Savannah River Nuclear Solutions, Inc.	-	●	●	●	●
	8505526	SR Construction - Parsons Subcontractors	●	●	●	●	●
	8509003	Univ. of Georgia Ecology Laboratories	●	●	●	●	●
	8509509	Wackenhut Services, Inc. - SRNS	●	●	●	-	-
	8509509	Centerra - SR	-	-	-	●	●
	8511002	Savannah River Nuclear Solutions, Inc.	●	●	●	●	●
	8511003	Savannah River National Laboratory	-	-	●	●	●
	8511004	SRNS Service Subs	●	●	●	●	●
	8511005	SRNS Construction	●	●	●	●	●
	8511006	SRNS Construction Subs	●	●	●	●	●
Separations Process Research Unit	1523016	NY SPRU	●	●	●	●	●
SLAC National Accelerator Facility	8008003	Stanford Linear Accelerator Center	●	●	●	●	●
Thomas Jefferson National Accelerator Facility	1509503	Thomas Jefferson National Accelerator Facility	●	●	●	●	●
	1509521	Jefferson Laboratory - DOE Employees	●	●	●	●	●
Uranium Mill Tailings Remediation Action Project	3260645	Uranium Mill Tailings Remedial Action - Moab	●	●	●	●	●
Waste Isolation Pilot Plant	0701001	Carlsbad Field Office	●	●	●	●	●
	0702003	LANL - WIPP	-	●	●	●	●
	0703104	Washington TRU Solutions LLC-WIPP	●	●	●	●	●
	0703109	Santa Fe Protective Services - WIPP	●	●	●	●	●
	0703114	WTS Subcontractors - WIPP	-	●	●	●	●
	0704003	Sandia National Laboratories - WIPP	-	-	●	-	-
West Valley Project	4539004	West Valley Nuclear Services, Inc. (WVNS)	●	●	●	●	●
Pittsburg Naval Reactor Office	6007504	PNR - BAPL & BPMI-P	●	●	●	●	●
	6008003	PNR - BAPL & BPMI-P	●	●	●	●	●
	6009003	Naval Reactors - Idaho	●	●	●	●	●
Schenectady Naval Reactor Office	9004003	Knolls Atomic Power Laboratory	●	●	●	-	●
	9005003	Knolls Atomic Power Laboratory	●	●	●	●	●
	9005004	Knolls Atomic Power Laboratory	●	●	●	-	●

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Exhibit A-3. Facility Type Codes.

The following is a list of Facility Type Codes reported to REMS in accordance with the REMS Reporting Guide. A facility type code is reported with each individual's dose record and indicates the facility type where the majority of the individual's dose was accrued during the monitoring year.

Facility Type Code	Description
10	Accelerator
21	Fuel/Uranium Enrichment
22	Fuel Fabrication
23	Fuel Processing
40	Maintenance and Support (Site-Wide)
50	Reactor
61	Research, General
62	Research, Fusion
70	Waste Processing/Mgmt.
80	Weapons Fab. and Testing
99	Other

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Exhibit B-1. Site Dose Data, 2016.

Site	Collective TED (person-rem)	Percent Change - Coll. TED		Number with Meas. Dose	Percent Change - # with Meas. Dose		Avg. Meas. TED (rem)	Percent Change - Avg. Meas. TED		Percentage of Coll. TED above 0.500 rem	Percent Change - Coll. TED above 0.500 rem	
Ames Laboratory	1.240	-1%	▼	41	5%	▲	0.030	-5%	▼	-	-	-
Argonne National Laboratory	13.080	-12%	▼	70	-16%	▼	0.187	5%	▲	56%	11%	▲
Brookhaven National Laboratory	3.217	-4%	▼	84	-37%	▼	0.038	53%	▲	-	-	-
Energy Technology Engineering Center	0.089	-	-	2	-	-	0.044	-	-	-	-	-
Fermi National Accelerator Laboratory	11.930	-28%	▼	232	-1%	▼	0.051	-27%	▼	-	-	-
Hanford: Hanford Site	41.095	-34%	▼	1,217	77%	▲	0.034	-63%	▼	2%	-96%	▼
Hanford: Office of River Protection	37.102	-4%	▼	929	43%	▲	0.040	-33%	▼	-	-	-
Hanford: Pacific Northwest National Laboratory	11.599	-8%	▼	420	-9%	▼	0.028	1%	▲	-	-	-
Idaho National Laboratory	92.670	-25%	▼	1,273	-4%	▼	0.073	-21%	▼	3%	-85%	▼
Kansas City National Security Campus	0.063	-	-	24	-	-	0.003	-	-	-	-	-
Lawrence Berkeley National Laboratory	0.823	-	-	13	-	-	0.063	-	-	-	-	-
Lawrence Livermore National Laboratory	8.215	1%	▲	98	-12%	▼	0.084	16%	▲	33%	32%	▲
Los Alamos National Laboratory	95.565	-2%	▼	1,106	-3%	▼	0.086	1%	▲	24%	1%	▲
National Renewable Energy Laboratory	0.034	-	-	7	-	-	0.005	-	-	-	-	-
Nevada National Security Site	3.295	-35%	▼	84	-14%	▼	0.039	-24%	▼	-	-	-
New Brunswick Laboratory	0.096	-	-	4	-	-	0.024	-	-	-	-	-
Oak Ridge: East Tennessee Technology Park	0.114	-	-	3	-	-	0.038	-	-	-	-	-
Oak Ridge: Oak Ridge Institute for Science and Education	0.171	-	-	9	-	-	0.019	-	-	-	-	-
Oak Ridge: Oak Ridge National Laboratory	69.378	16%	▲	617	3%	▲	0.112	12%	▲	18%	4%	▲
Oak Ridge: Y-12 National Security Complex	72.752	25%	▲	1,459	21%	▲	0.050	3%	▲	2%	3%	▲
Office of Secure Transportation	0.072	-	-	3	-	-	0.024	-	-	-	-	-
Paducah Gaseous Diffusion Plant	6.201	-12%	▼	559	66%	▲	0.011	-47%	▼	-	-	-
Pantex Plant	25.918	15%	▲	295	-2%	▼	0.088	17%	▲	10%	32%	▲
Portsmouth Gaseous Diffusion Plant	2.509	-47%	▼	40	-32%	▼	0.063	-22%	▼	-	-	-
Princeton Plasma Physics Laboratory	0.311	-	-	78	-	-	0.004	-	-	-	-	-
Sandia National Laboratories	2.756	-48%	▼	68	-31%	▼	0.041	-24%	▼	-	-	-
Savannah River National Lab	12.358	-	-	361	-	-	0.034	-	-	-	-	-
Savannah River Site	98.980	4%	▲	2,438	29%	▲	0.041	-20%	▼	-	-	-
Separations Process Research Unit	47.541	-31%	▼	101	-32%	▼	0.471	1%	▲	77%	-1%	▼
SLAC National Accelerator Laboratory	0.170	-	-	6	-	-	0.028	-	-	-	-	-
Thomas Jefferson National Accelerator Facility	0.777	-	-	30	-	-	0.026	-	-	-	-	-
Uranium Mill Tailings Remedial Action Project	7.044	-2%	▼	131	52%	▲	0.054	-36%	▼	8%	-	-
Waste Isolation Pilot Plant	0.311	-	-	22	-	-	0.014	-	-	-	-	-
West Valley Demonstration Project	41.122	46%	▲	147	20%	▲	0.280	21%	▲	47%	39%	▲
Service Center Personnel*	0.268	-	-	16	-	-	0.017	-	-	-	-	-
Totals	708.866	-5%	▼	11,987	19%	▲	0.059	-20%	▼	15%	-31%	▼

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP, in addition to several smaller facilities not associated with a DOE site.

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Exhibit B-2. Site Dose Data, 2017.

Site	Collective TED (person-rem)	Percent Change - Coll. TED	Number with Meas. Dose	Percent Change - # with Meas. Dose	Avg. Meas. TED (rem)	Percent Change - Avg. Meas. TED	Percentage of Coll. TED above 0.500 rem	Percent Change - Coll. TED above 0.500 rem
Ames Laboratory	1.053	-15% ▼	38	-7% ▼	0.028	-8% ▼	-	-
Argonne National Laboratory	9.885	-24% ▼	75	7% ▲	0.132	-29% ▼	50%	-11% ▼
Brookhaven National Laboratory	6.076	89% ▲	77	-8% ▼	0.079	106% ▲	-	-
Energy Technology Engineering Center	0.026	-	2	-	0.013	-	-	-
Fermi National Accelerator Laboratory	10.210	-14% ▼	201	-13% ▼	0.051	-1% ▼	-	-
Grand Junction Site	0.010	-	2	-	0.005	-	-	-
Hanford: Hanford Site	27.003	-34% ▼	717	-41% ▼	0.038	12% ▲	-	-
Hanford: Office of River Protection	24.387	-34% ▼	597	-36% ▼	0.041	2% ▲	-	-
Hanford: Pacific Northwest National Laboratory	13.555	17% ▲	517	23% ▲	0.026	-5% ▼	-	-
Idaho National Laboratory	79.008	-15% ▼	1,175	-8% ▼	0.067	-8% ▼	1%	-76% ▼
Kansas City National Security Campus	0.171	-	44	-	0.004	-	-	-
Lawrence Berkeley National Laboratory	1.257	53% ▲	18	38% ▲	0.070	10% ▲	-	-
Lawrence Livermore National Laboratory	7.134	-13% ▼	115	17% ▲	0.062	-26% ▼	28%	-15% ▼
Los Alamos National Laboratory	160.772	68% ▲	1,850	67% ▲	0.087	1% ▲	24%	0%
National Renewable Energy Laboratory	0.020	-	4	-	0.005	-	-	-
Nevada National Security Site	3.858	17% ▲	94	12% ▲	0.041	5% ▲	-	-
Oak Ridge: East Tennessee Technology Park	0.093	-	6	-	0.016	-	-	-
Oak Ridge: Oak Ridge Institute for Science and Education	0.243	-	23	-	0.011	-	-	-
Oak Ridge: Oak Ridge National Laboratory	87.621	26% ▲	661	7% ▲	0.133	18% ▲	32%	80% ▲
Oak Ridge: Y-12 National Security Complex	75.761	4% ▲	1,455	0%	0.052	4% ▲	2%	1% ▲
Office of Secure Transportation	0.311	-	8	-	0.039	-	-	-
Paducah Gaseous Diffusion Plant	5.159	-17% ▼	113	-80% ▼	0.046	312% ▲	-	-
Pantex Plant	24.986	-4% ▼	333	13% ▲	0.075	-15% ▼	8%	-28% ▼
Portsmouth Gaseous Diffusion Plant	2.553	2% ▲	41	2% ▲	0.062	-1% ▼	-	-
Princeton Plasma Physics Laboratory	0.361	-	49	-	0.007	-	-	-
Sandia National Laboratories	2.146	-22% ▼	73	7% ▲	0.029	-27% ▼	-	-
Savannah River National Lab	20.051	62% ▲	576	60% ▲	0.035	2% ▲	-	-
Savannah River Site	152.495	54% ▲	3,835	57% ▲	0.040	-2% ▼	5%	0%
Separations Process Research Unit	5.185	-89% ▼	59	-42% ▼	0.088	-81% ▼	-	-
SLAC National Accelerator Laboratory	0.091	-	4	-	0.014	-	-	-
Thomas Jefferson National Accelerator Facility	0.057	-	20	-	0.014	-	-	-
Uranium Mill Tailings Remedial Action Project	0.270	-20% ▼	66	-50% ▼	0.086	59% ▲	-	-
Waste Isolation Pilot Plant	5.656	-	17	-	0.016	-	-	-
West Valley Demonstration Project	0.279	-18% ▼	154	5% ▲	0.219	-22% ▼	40%	-15% ▼
Service Center Personnel*	33.653	-	5	-	0.180	-	-	-
Totals	761.396	7% ▲	13,024	9% ▲	0.058	-1% ▼	13%	-16% ▼

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP, in addition to several smaller facilities not associated with a DOE site.

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Exhibit B-3. Site Dose Data, 2018.

Site	Collective TED (person-rem)	Percent Change - Coll. TED	Number with Meas. Dose	Percent Change - # with Meas. Dose	Avg. Meas. TED (rem)	Percent Change - Avg. Meas. TED	Percentage of Coll. TED above 0.500 rem	Percent Change - Coll. TED above 0.500 rem
Ames Laboratory	0.935	-	33	-	0.028	-	-	-
Argonne National Laboratory	7.112	-28% ▼	75	0%	0.095	-28% ▼	26%	-48% ▼
Brookhaven National Laboratory	3.924	-35% ▼	125	62% ▲	0.031	-60% ▼	-	-
Energy Technology Engineering Center	0.059	-	3	-	0.020	-	-	-
Fermi National Accelerator Laboratory	9.980	-2% ▼	188	-6% ▼	0.053	5% ▲	-	-
Grand Junction Site	0.336	-	22	-	0.015	-	-	-
Hanford: Hanford Site	27.172	1% ▲	566	-21% ▼	0.048	27% ▲	18%	0%
Hanford: Office of River Protection	24.926	2% ▲	570	-5% ▼	0.044	7% ▲	-	-
Hanford: Pacific Northwest National Laboratory	12.225	-10% ▼	494	-4% ▼	0.025	-6% ▼	-	-
Idaho National Laboratory	86.266	9% ▲	1,368	16% ▲	0.063	-6% ▼	1%	88% ▲
Kansas City National Security Campus	0.428	-	58	-	0.007	-	-	-
Lawrence Berkeley National Laboratory	1.014	-19% ▼	22	22% ▲	0.046	-34% ▼	-	-
Lawrence Livermore National Laboratory	8.691	22% ▲	145	26% ▲	0.060	-3% ▼	14%	-51% ▼
Los Alamos National Laboratory	203.451	27% ▲	1,953	6% ▲	0.104	20% ▲	27%	14% ▲
National Renewable Energy Laboratory	0.006	-	1	-	0.006	-	-	-
Nevada National Security Site	3.893	1% ▲	74	-21% ▼	0.053	28% ▲	-	-
Oak Ridge: East Tennessee Technology Park	0.147	-	18	-	0.008	-	-	-
Oak Ridge: Oak Ridge Institute for Science and Education	0.317	-	20	-	0.016	-	-	-
Oak Ridge: Oak Ridge National Laboratory	76.833	-12% ▼	615	-7% ▼	0.125	-6% ▼	34%	4% ▲
Oak Ridge: Y-12 National Security Complex	65.234	-14% ▼	1,516	4% ▲	0.043	-17% ▼	1%	-56% ▼
Office of Secure Transportation	0.288	-	14	-	0.021	-	-	-
Paducah Gaseous Diffusion Plant	4.580	-11% ▼	109	-4% ▼	0.042	-8% ▼	-	-
Pantex Plant	22.927	-8% ▼	312	-6% ▼	0.073	-2% ▼	8%	1% ▲
Portsmouth Gaseous Diffusion Plant	3.588	41% ▲	69	68% ▲	0.052	-16% ▼	-	-
Princeton Plasma Physics Laboratory	0.239	-	38	-	0.006	-	-	-
Sandia National Laboratories	5.819	171% ▲	175	140% ▲	0.033	13% ▲	-	-
Savannah River National Lab	8.463	-58% ▼	314	-45% ▼	0.027	-23% ▼	-	-
Savannah River Site	126.869	-17% ▼	4,101	7% ▲	0.031	-22% ▼	-	-
Separations Process Research Unit	0.208	-	10	-	0.021	-	-	-
SLAC National Accelerator Laboratory	0.047	-	3	-	0.016	-	-	-
Thomas Jefferson National Accelerator Facility	0.526	-	26	-	0.020	-	-	-
Uranium Mill Tailings Remedial Action Project	5.485	-3% ▼	77	17% ▲	0.071	-17% ▼	-	-
Waste Isolation Pilot Plant	0.909	-	42	-	0.022	-	-	-
West Valley Demonstration Project	35.549	6% ▲	160	4% ▲	0.222	2% ▲	48%	21% ▲
Service Center Personnel*	0.149	-	4	-	0.037	-	-	-
Totals	748.595	-2% ▼	13,320	2% ▲	0.056	-4% ▼	15%	13% ▲

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP, in addition to several smaller facilities not associated with a DOE site.

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Exhibit B-4. Internal Dose by Site, 2016–2018.

Site	No. of Individuals with Measurable CED* 2016	No. of Individuals with Measurable CED* 2017	No. of Individuals with Measurable CED* 2018	Collective CED Dose (person-rem) 2016	Collective CED Dose (person-rem) 2017	Collective CED Dose (person-rem) 2018	Average Measurable CED 2016	Average Measurable CED 2017	Average Measurable CED 2018
Argonne National Laboratory	1	3	–	0.114	0.261	–	0.114 ◀	0.087	–
Hanford: Hanford Site	3	22	–	0.016	0.102	–	0.005	0.005	–
Hanford: Pacific Northwest National Laboratory	2	–	4	0.004	–	0.007	0.002	–	0.002
Idaho National Laboratory	2	3	2	0.065	0.063	0.171	0.033	0.021	0.086 ◀
Lawrence Livermore National Laboratory	2	–	3	0.029	–	0.045	0.015	–	0.015
Los Alamos National Laboratory	29	11	14	0.111	0.062	0.049	0.004	0.006	0.004
Oak Ridge: Oak Ridge National Laboratory	4	2	3	0.055	0.233	0.045	0.014	0.116 ◀	0.015
Oak Ridge: Y-12 National Security Complex	1,130 ◀	1,206 ◀	1,265 ◀	59.165 ◀	63.961 ◀	53.936	0.052	0.053	0.043
Paducah Gaseous Diffusion Plant	7	5	4	0.087	0.099	0.076	0.012	0.020	0.019
Pantex Plant	1	1	–	0.001	0.001	–	0.001	0.001	–
Sandia National Laboratories	1	4	7	0.001	0.190	0.034	0.001	0.048	0.005
Savannah River Site	5	1	2	0.020	0.004	0.007	0.004	0.004	0.004
Uranium Mill Tailings Remedial Action Project	54	29	29	1.876	0.947	0.828	0.035	0.033	0.029
Totals	1,241	1,287	1,333	61.544	65.923	55.198	0.050	0.051	0.041

Note: Boxed values (gray background) indicate the greatest value in each column.

* The number of internal depositions represents the number of internal dose records with positive results reported for each individual.

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Exhibit B-5. Neutron Dose Distribution by Site, 2018.

Site	No. Meas. Dose	Meas. < 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.00	1.0–2.0	>2.0	Total Monitored *	No. of Individuals with Meas. Dose	% of Individuals with Meas. Dose	Collective Neutron Dose (person-rem)	Avg. Meas. Neutron Dose (rem)
Ames Laboratory	192	–	–	–	–	–	–	–	192	–	–	–	–
Argonne National Laboratory	1,791	–	–	–	–	–	–	–	1,791	–	–	–	–
Brookhaven National Laboratory	4,000	2	–	–	–	–	–	–	4,002	2	0%	0.015	0.008
Energy Technology Engineering Center	7	–	–	–	–	–	–	–	7	–	–	–	–
Fermi National Accelerator Laboratory	1,454	–	–	–	–	–	–	–	1,454	–	–	–	–
Grand Junction Site	27	–	–	–	–	–	–	–	27	–	–	–	–
Hanford: Hanford Site	3,481	187	1	–	–	–	–	–	3,669	188	5	1.886	0.010
Hanford: Office of River Protection	2,796	3	–	–	–	–	–	–	2,799	3	0%	0.120	0.040
Hanford: Pacific Northwest National Laboratory	2,413	–	–	–	–	–	–	–	2,413	–	–	–	–
Idaho National Laboratory	7,354	39	3	–	–	–	–	–	7,396	42	1	1.440	0.034
Kansas City Security Campus	164	–	–	–	–	–	–	–	164	–	–	–	–
Lawrence Berkeley National Laboratory	935	–	–	–	–	–	–	–	935	–	–	–	–
Lawrence Livermore National Laboratory	3,711	33	2	2	–	–	–	–	3,748	37	1%	1.734	0.047
Los Alamos National Laboratory	10,667	891	185	67	16	7	3	–	11,836	1,169	10%	95.993	0.082
National Renewable Energy Laboratory	11	–	–	–	–	–	–	–	11	–	–	–	–
Nevada National Security Site	1,414	1	–	–	–	–	–	–	1,415	1	0%	0.022	0.022
Oak Ridge: East Tennessee Technology Park	360	–	–	–	–	–	–	–	360	–	–	–	–
Oak Ridge: Oak Ridge Institute for Science and Education	89	–	–	–	–	–	–	–	89	–	–	–	–
Oak Ridge: Oak Ridge National Laboratory	3,882	179	45	3	2	–	–	–	4,111	229	6%	15.755	0.069
Oak Ridge: Y-12 National Security Complex	5,785	9	–	–	–	–	–	–	5,794	9	0%	0.245	0.027
Office of Secure Transportation	319	–	–	–	–	–	–	–	319	–	–	–	–
Paducah Gaseous Diffusion Plant	1,281	–	–	–	–	–	–	–	1,281	–	–	–	–
Pantex Plant	5,002	35	2	–	–	–	–	–	5,039	37	1%	1.758	0.048
Portsmouth Gaseous Diffusion Plant	2,491	11	2	–	–	–	–	–	2,504	13	1%	0.759	0.058
Princeton Plasma Physics Laboratory	348	–	–	–	–	–	–	–	348	–	–	–	–
Sandia National Laboratories	1,861	17	–	–	–	–	–	–	1,878	17	1%	0.768	0.045
Savannah River National Lab	383	–	–	–	–	–	–	–	383	–	–	–	–
Savannah River Site	6,117	62	25	7	–	–	–	–	6,211	94	2%	9.004	0.096
Separations Process Research Unit	101	–	–	–	–	–	–	–	101	–	–	–	–
SLAC National Accelerator Facility	2,650	–	–	–	–	–	–	–	2,650	–	–	–	–
Thomas Jefferson National Accelerator Facility	1,262	–	–	–	–	–	–	–	1,262	–	–	–	–
Uranium Mill Tailings Remediation Action Project	125	–	–	–	–	–	–	–	125	–	–	–	–
Waste Isolation Pilot Plant	594	–	–	–	–	–	–	–	594	–	–	–	–
West Valley Project	415	–	–	–	–	–	–	–	415	–	–	–	–
Service Center Personnel**	283	–	–	–	–	–	–	–	283	–	–	–	–
Totals	73,765	1,469	265	79	18	7	3	–	75,606	1,841	2%	129.499	0.070

Note: Boxed values (gray background) indicate the greatest value in each column.

*Represents the total number of monitoring records. The number of individuals specifically monitored for neutron radiation cannot be determined.

**Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP, in addition to several smaller facilities not associated with a DOE site.

DOE Occupational Radiation Exposure Report for CY 2018
Exhibit B-6a. Distribution of TED by Facility Type, 2016.

TOTAL EFFECTIVE DOSE (TED)																
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Facility Type	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Accelerator	7,035	288	41	7	–	–	–	–	–	–	–	7,371	5%	336	15.724	0.047
Fuel Processing	481	303	8	1	–	–	–	–	–	–	–	793	39%	312	9.043	0.029
Fuel/Uranium Enrichment	709	59	–	–	–	–	–	–	–	–	–	768	8%	59	0.517	0.009
Maintenance and Support	10,652	2,125	287	68	19	8	4	–	–	–	–	13,163	19%	2,511	149.485	0.060
Other	5,970	828	42	20	–	–	–	–	–	–	–	6,860	13%	890	29.364	0.033
Reactor	69	24	2	–	–	–	–	–	–	–	–	95	27%	26	1.230	0.047
Research, Fusion	385	82	–	–	–	–	–	–	–	–	–	467	18%	82	0.414	0.005
Research, General	26,972	2,692	339	129	17	3	8	–	–	–	–	30,160 ◀	11%	3,188 ◀	183.899	0.058
Waste Processing/Management	3,590	2,154	316	161	48	26	8	–	–	–	–	6,303	43% ◀	2,713	219.397 ◀	0.081 ◀
Weapons Fabrication and Testing	9,986	1,587	211	65	6	1	–	–	–	–	–	11,856	16%	1,870	99.793	0.053
Totals	65,849	10,142	1,246	451	90	38	20	–	–	–	–	77,836	15%	11,987	708.866	0.059

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure Report for CY 2018

Exhibit B-6b. Distribution of TED by Facility Type, 2017.

TOTAL EFFECTIVE DOSE (TED)																
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Facility Type	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Accelerator	7,984	234	43	8	–	–	–	–	–	–	–	8,269	3%	285	15.149	0.053
Fuel Processing	298	353	18	–	–	–	–	–	–	–	–	669	55% ◀	371	11.098	0.030
Fuel/Uranium Enrichment	366	6	–	–	–	–	–	–	–	–	–	372	2%	6	0.093	0.016
Maintenance and Support	10,927	2,202	366	121	19	5	17	–	–	–	–	13,657	20%	2,730	196.110	0.072 ◀
Other	6,095	804	31	11	–	–	–	–	–	–	–	6,941	12%	846	23.918	0.028
Reactor	91	13	1	–	–	–	–	–	–	–	–	105	13%	14	0.586	0.042
Research, Fusion	388	50	–	–	–	–	–	–	–	–	–	438	11%	50	0.376	0.008
Research, General	27,409	2,806	351	94	30	8	4	–	–	–	–	30,702 ◀	11%	3,293	188.750	0.057
Waste Processing/Management	3,618	2,777	372	180	48	–	–	–	–	–	–	6,995	48%	3,377 ◀	221.068 ◀	0.065
Weapons Fabrication and Testing	9,703	1,766	214	66	6	–	–	–	–	–	–	11,755	17%	2,052	104.248	0.051
Totals	66,879	11,011	1,396	480	103	13	21	–	–	–	–	79,903	16%	13,024	761.396	0.058

Note: Boxed values (gray background) indicate the greatest value in each column.

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Exhibit B-6c. Distribution of TED by Facility Type, 2018.

TOTAL EFFECTIVE DOSE (TED)																
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Facility Type	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Accelerator	9,398	417	67	12	3	–	–	–	–	–	–	9,897	5%	499	26.049	0.052
Fuel Processing	341	436	18	–	–	–	–	–	–	–	–	795	57% ◀	454	12.000	0.026
Fuel/Uranium Enrichment	342	18	–	–	–	–	–	–	–	–	–	360	5%	18	0.147	0.008
Maintenance and Support	5,879	831	92	23	2	–	–	–	–	–	–	6,827	14%	948	42.493	0.045
Other	5,504	807	56	21	7	1	–	–	–	–	–	6,396	14%	892	36.662	0.041
Reactor	84	17	4	–	–	–	–	–	–	–	–	105	20%	21	1.163	0.055
Research, Fusion	377	46	–	–	–	–	–	–	–	–	–	423	11%	46	0.507	0.011
Research, General	25,385	3,412	373	132	17	15	1	–	–	–	–	29,335 ◀	13%	3,950 ◀	212.744	0.054
Waste Processing/Management	3,846	2,965	295	95	30	6	–	–	–	–	–	7,237	47%	3,391	177.419	0.052
Weapons Fabrication and Testing	11,130	2,456	431	145	38	17	14	–	–	–	–	14,231	22%	3,101	239.411 ◀	0.077 ◀
Totals	62,286	11,405	1,336	428	97	39	15	–	–	–	–	75,606	18%	13,320	748.595	0.056

Note: Boxed values (gray background) indicate the greatest value in each column.

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Exhibit B-7a. Collective TED by Site and Facility Type, 2016.

Site	Accelerator	Fuel/Uranium Enrichment	Fuel Processing	Maintenance and Support	Reactor	Research, General	Research, Fusion	Waste Processing/Management	Weapons Fabrication and Testing	Other	Totals
Ames Laboratory	-	-	-	-	-	1.240	-	-	-	-	1.240
Argonne National Laboratory	-	-	-	-	-	13.080	-	-	-	-	13.080
Brookhaven National Laboratory	2.518	-	-	0.333	-	-	-	0.366	-	-	3.217
Energy Technology Engineering Center	-	-	-	-	-	-	-	-	-	0.089	0.089
Fermi National Accelerator Laboratory	11.930 ◀	-	-	-	-	-	-	-	-	-	11.930
Hanford: Hanford Site	-	-	-	32.589	-	-	-	0.015	-	8.491	41.095
Hanford: Office of River Protection	-	-	-	11.119	-	-	-	11.240	-	14.743 ◀	37.102
Hanford: Pacific Northwest National Laboratory	-	-	-	-	-	11.599	-	-	-	-	11.599
Idaho National Laboratory	-	-	-	-	-	92.670 ◀	-	-	-	-	92.670
Kansas City National Security Campus	-	-	-	-	-	-	-	-	0.063	-	0.063
Lawrence Berkeley National Laboratory	-	-	-	-	-	0.823	-	-	-	-	0.823
Lawrence Livermore National Laboratory	-	-	-	-	-	8.215	-	-	-	-	8.215
Los Alamos National Laboratory	0.006	-	-	93.633 ◀	-	0.028	-	-	-	1.898	95.565
National Renewable Energy Laboratory	-	-	-	-	-	0.034	-	-	-	-	0.034
Nevada National Security Site	-	-	-	3.295	-	-	-	-	-	-	3.295
New Brunswick Laboratory	-	-	-	-	-	0.096	-	-	-	-	0.096
Oak Ridge: East Tennessee Technology Park	-	0.114	-	-	-	-	-	-	-	-	0.114
Oak Ridge: Oak Ridge Institute for Science and Education	-	-	-	-	-	0.171	-	-	-	-	0.171
Oak Ridge: Oak Ridge National Laboratory	-	-	-	-	-	41.747	-	27.631	-	-	69.378
Oak Ridge: Y-12 National Security Complex	-	-	-	-	-	-	-	-	72.752 ◀	-	72.752
Office of Secure Transportation	-	-	-	-	-	-	-	-	0.072	-	0.072
Paducah Gaseous Diffusion Plant	-	0.403 ◀	-	-	-	2.636	-	3.162	-	-	6.201
Pantex Plant	-	-	-	-	-	-	-	-	25.918	-	25.918
Portsmouth Gaseous Diffusion Plant	-	-	-	-	-	2.509	-	-	-	-	2.509
Princeton Plasma Physics Laboratory	-	-	-	-	-	-	0.311 ◀	-	-	-	0.311
Sandia National Laboratories	0.323	-	-	0.010	1.230 ◀	0.845	0.103	0.024	0.062	0.159	2.756
Savannah River National Lab	-	-	0.745	4.720	-	6.653	-	0.225	-	0.015	12.358
Savannah River Site	-	-	8.298 ◀	3.786	-	1.296	-	80.705 ◀	0.926	3.969	98.980 ◀
Separations Process Research Unit	-	-	-	-	-	-	-	47.541	-	-	47.541
SLAC National Accelerator Laboratory	0.170	-	-	-	-	-	-	-	-	-	0.170
Thomas Jefferson National Accelerator Facility	0.777	-	-	-	-	-	-	-	-	-	0.777
Uranium Mill Tailings Remedial Action Project	-	-	-	-	-	-	-	7.044	-	-	7.044
Waste Isolation Pilot Plant	-	-	-	-	-	-	-	0.311	-	-	0.311
West Valley Demonstration Project	-	-	-	-	-	-	-	41.122	-	-	41.122
Service Center Personnel*	-	-	-	-	-	0.257	-	0.011	-	-	0.268
Totals	15.724	0.517	9.043	149.485	1.230	183.899	0.414	219.397	99.793	29.364	708.866

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP.

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Exhibit B-7b. Collective TED by Site and Facility Type, 2017.

Site	Accelerator	Fuel/Uranium Enrichment	Fuel Processing	Maintenance and Support	Reactor	Research, General	Research, Fusion	Waste Processing/Management	Weapons Fabrication and Testing	Other	Totals
Ames Laboratory	-	-	-	-	-	1.053	-	-	-	-	1.053
Argonne National Laboratory	-	-	-	-	-	9.885	-	-	-	-	9.885
Brookhaven National Laboratory	4.513	-	-	1.289	-	-	-	0.274	-	-	6.076
Energy Technology Engineering Center	-	-	-	-	-	-	-	-	-	0.026	0.026
Fermi National Accelerator Laboratory	10.210	-	-	-	-	-	-	-	-	-	10.210
Grand Junction Site	-	-	-	-	-	-	-	-	-	0.010	0.010
Hanford: Hanford Site	-	-	-	20.425	-	-	-	-	-	6.578	27.003
Hanford: Office of River Protection	-	-	-	0.135	-	-	-	16.276	-	7.976	24.387
Hanford: Pacific Northwest National Laboratory	-	-	-	-	-	13.555	-	-	-	-	13.555
Idaho National Laboratory	-	-	-	-	-	79.008	-	-	-	-	79.008
Kansas City National Security Campus	-	-	-	-	-	-	-	-	0.171	-	0.171
Lawrence Berkeley National Laboratory	-	-	-	-	-	1.257	-	-	-	-	1.257
Lawrence Livermore National Laboratory	-	-	-	-	-	7.134	-	-	-	-	7.134
Los Alamos National Laboratory	0.012	-	-	159.080	-	0.071	-	-	-	1.609	160.772
National Renewable Energy Laboratory	-	-	-	-	-	0.020	-	-	-	-	0.020
Nevada National Security Site	-	-	-	3.858	-	-	-	-	-	-	3.858
Oak Ridge: East Tennessee Technology Park	-	0.093	-	-	-	-	-	-	-	-	0.093
Oak Ridge: Oak Ridge Institute for Science and Education	-	-	-	-	-	0.243	-	-	-	-	0.243
Oak Ridge: Oak Ridge National Laboratory	-	-	-	-	-	54.943	-	32.678	-	-	87.621
Oak Ridge: Y-12 National Security Complex	-	-	-	-	-	-	-	-	75.761	-	75.761
Office of Secure Transportation	-	-	-	-	-	-	-	-	0.311	-	0.311
Paducah Gaseous Diffusion Plant	-	-	-	0.020	-	0.119	-	5.020	-	-	5.159
Pantex Plant	-	-	-	-	-	-	-	-	24.986	-	24.986
Portsmouth Gaseous Diffusion Plant	-	-	-	-	-	2.553	-	-	-	-	2.553
Princeton Plasma Physics Laboratory	-	-	-	-	-	-	0.361	-	-	-	0.361
Sandia National Laboratories	0.087	-	-	0.151	0.586	0.376	0.015	0.240	0.174	0.517	2.146
Savannah River National Laboratory	-	-	0.084	5.684	-	13.922	-	0.277	-	0.084	20.051
Savannah River Site	-	-	11.014	5.468	-	4.520	-	121.530	2.845	7.118	152.495
Separations Process Research Unit	-	-	-	-	-	-	-	5.185	-	-	5.185
SLAC National Accelerator Laboratory	0.057	-	-	-	-	-	-	-	-	-	0.057
Thomas Jefferson National Accelerator Facility	0.270	-	-	-	-	-	-	-	-	-	0.270
Uranium Mill Tailings Remedial Action Project	-	-	-	-	-	-	-	5.656	-	-	5.656
Waste Isolation Pilot Plant	-	-	-	-	-	-	-	0.279	-	-	0.279
West Valley Demonstration Project	-	-	-	-	-	-	-	33.653	-	-	33.653
Service Center Personnel*	-	-	-	-	-	0.091	-	-	-	-	0.091
Totals	15.149	0.093	11.098	196.110	0.586	188.750	0.376	221.068	104.248	23.918	761.396

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP.

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Exhibit B-7c. Collective TED by Site and Facility Type, 2018.

Site	Accelerator	Fuel/Uranium Enrichment	Fuel Processing	Maintenance and Support	Reactor	Research, General	Research, Fusion	Waste Processing/Management	Weapons Fabrication and Testing	Other	Totals
Ames Laboratory	-	-	-	-	-	0.935	-	-	-	-	0.935
Argonne National Laboratory	-	-	-	-	-	7.112	-	-	-	-	7.112
Brookhaven National Laboratory	3.372	-	-	0.454	-	-	-	0.098	-	-	3.924
Energy Technology Engineering Center	-	-	-	-	-	0.059	-	-	-	-	0.059
Fermi National Accelerator Laboratory	9.980	-	-	-	-	-	-	-	-	-	9.980
Grand Junction Site	-	-	-	-	-	-	-	-	-	0.336	0.336
Hanford: Hanford Site	-	-	-	19.027	-	-	-	-	-	8.145	27.172
Hanford: Office of River Protection	-	-	-	-	-	-	-	12.931	-	11.995	24.926
Hanford: Pacific Northwest National Laboratory	-	-	-	-	-	12.225	-	-	-	-	12.225
Idaho National Laboratory	-	-	-	-	-	86.266	-	-	-	-	86.266
Kansas City National Security Campus	-	-	-	-	-	-	-	-	0.428	-	0.428
Lawrence Berkeley National Laboratory	-	-	-	-	-	1.014	-	-	-	-	1.014
Lawrence Livermore National Laboratory	-	-	-	1.286	-	7.405	-	-	-	-	8.691
Los Alamos National Laboratory	11.149	-	-	7.169	-	26.627	-	3.230	146.641	8.635	203.451
National Renewable Energy Laboratory	-	-	-	-	-	0.006	-	-	-	-	0.006
Nevada National Security Site	-	-	-	3.893	-	-	-	-	-	-	3.893
Oak Ridge: East Tennessee Technology Park	-	0.147	-	-	-	-	-	-	-	-	0.147
Oak Ridge: Oak Ridge Institute for Science and Education	-	-	-	-	-	0.317	-	-	-	-	0.317
Oak Ridge: Oak Ridge National Laboratory	-	-	-	-	-	48.647	-	28.186	-	-	76.833
Oak Ridge: Y-12 National Security Complex	-	-	-	-	-	-	-	-	65.234	-	65.234
Office of Secure Transportation	-	-	-	-	-	-	-	-	0.260	0.028	0.288
Paducah Gaseous Diffusion Plant	-	-	-	0.051	-	0.087	-	4.442	-	-	4.580
Pantex Plant	-	-	-	-	-	-	-	-	22.927	-	22.927
Portsmouth Gaseous Diffusion Plant	-	-	-	-	-	3.588	-	-	-	-	3.588
Princeton Plasma Physics Laboratory	-	-	-	-	-	-	0.239	-	-	-	0.239
Sandia National Laboratories	0.975	-	-	0.627	1.163	1.437	0.268	0.541	0.132	0.676	5.819
Savannah River National Laboratory	-	-	0.027	1.007	-	7.117	-	0.156	0.040	0.116	8.463
Savannah River Site	-	-	11.973	8.979	-	9.753	-	85.684	3.749	6.731	126.869
Separations Process Research Unit	-	-	-	-	-	-	-	0.208	-	-	0.208
SLAC National Accelerator Laboratory	0.047	-	-	-	-	-	-	-	-	-	0.047
Thomas Jefferson National Accelerator Facility	0.526	-	-	-	-	-	-	-	-	-	0.526
Uranium Mill Tailings Remedial Action Project	-	-	-	-	-	-	-	5.485	-	-	5.485
Waste Isolation Pilot Plant	-	-	-	-	-	-	-	0.909	-	-	0.909
West Valley Demonstration Project	-	-	-	-	-	-	-	35.549	-	-	35.549
Service Center Personnel*	-	-	-	-	-	0.149	-	-	-	-	0.149
Totals	26.049	0.147	12.000	42.493	1.163	212.744	0.507	177.419	239.411	36.662	748.595

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP.

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Exhibit B-8. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Accelerator Facilities, 2018.

ACCELERATORS

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

Site/Contractor	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Los Alamos National Laboratory	700	112	17	11	3	–	–	–	–	–	–	843	17% ◀	143	11.149 ◀	0.078 ◀
Fermi National Accelerator Lab	1,266	149	38	1	–	–	–	–	–	–	–	1,454	13%	188 ◀	9.980	0.053
Brookhaven National Laboratory	3,197	90	12	–	–	–	–	–	–	–	–	3,299 ◀	3%	102	3.372	0.033
Sandia National Laboratories	352	37	–	–	–	–	–	–	–	–	–	389	10%	37	0.975	0.026
Thomas Jefferson Natl. Accel. Facil.	1,231	26	–	–	–	–	–	–	–	–	–	1,257	2%	26	0.526	0.020
SLAC National Accelerator Laboratory	2,647	3	–	–	–	–	–	–	–	–	–	2,650	0%	3	0.047	0.016
Thomas Jefferson Site Office-DOE Employees	5	–	–	–	–	–	–	–	–	–	–	5	0%	–	0.000	–
Totals	9,398	417	67	12	3	–	–	–	–	–	–	9,897	5%	499	26.049	0.052

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure Report for CY 2018

Exhibit B-9. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Fuel Facilities, 2018.

FUEL FACILITIES																
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Site/Contractor	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
ENRICHMENT																
URS/CH2MHill - Oak Ridge (UCOR): ETPP	342	18	–	–	–	–	–	–	–	–	–	360	5%	18	0.147	0.008
Totals	342	18	–	–	–	–	–	–	–	–	–	360	5%	18	0.147	0.008
FABRICATION																
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PROCESSING																
SRNS Construction	27	19	4	–	–	–	–	–	–	–	–	50	46%	23	0.769	0.033
SRNS Construction Subs	1	2	–	–	–	–	–	–	–	–	–	3	67%	2	0.059	0.030
Savannah River Nuclear Solutions	246	335	14	–	–	–	–	–	–	–	–	595	59%	349	10.157	0.029
Savannah River Field Office	5	10	–	–	–	–	–	–	–	–	–	15	67%	10	0.182	0.018
SRNS Service Subs	3	7	–	–	–	–	–	–	–	–	–	10	70%	7	0.094	0.013
Centerra - SR	57	60	–	–	–	–	–	–	–	–	–	117	51%	60	0.712	0.012
Savannah River National Laboratory	–	3	–	–	–	–	–	–	–	–	–	3	1%	3	0.027	0.009
Misc. DOE Contractors - SR	2	–	–	–	–	–	–	–	–	–	–	2	0%	0	0.000	0.000
Totals	341	436	18	–	–	–	–	–	–	–	–	795	57%	454	12	0.026

Note: Boxed values (gray background) indicate the greatest value in each column.

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Exhibit B-10. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Maintenance and Support, 2018.

MAINTENANCE AND SUPPORT

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

Site/Contractor	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
MSTS - Las Vegas	293	33	4	2	–	–	–	–	–	–	–	332	12%	39	1.960	0.050
Savannah River Nuclear Solutions	67	147	18	1	–	–	–	–	–	–	–	233	71%	166	6.736	0.041
Los Alamos National Lab Construction Subs	4	1	–	–	–	–	–	–	–	–	–	5	20%	1	0.036	0.036
Savannah River National Laboratory	3	28	2	–	–	–	–	–	–	–	–	33	91%	30	1.007	0.034
Sandia National Laboratories	414	23	1	–	–	–	–	–	–	–	–	438	5%	24	0.627	0.026
Brookhaven National Laboratory	638	19	1	–	–	–	–	–	–	–	–	658	3%	20	0.454	0.023
Navarro-Intera LLC	19	1	–	–	–	–	–	–	–	–	–	20	5%	1	0.022	0.022
MSTS - NTS subcontractors	43	1	–	–	–	–	–	–	–	–	–	44	2%	1	0.021	0.021
SRNS Construction	4	8	–	–	–	–	–	–	–	–	–	12	67%	8	0.169	0.021
MSTS - Special Tech. Lab	15	1	–	–	–	–	–	–	–	–	–	16	6%	1	0.020	0.020
Wackenhut Services Inc. - NV	217	5	–	–	–	–	–	–	–	–	–	222	2%	5	0.100	0.020
Mission Support Alliance	1,065	142	2	–	–	–	–	–	–	–	–	1,209	12%	144	2.616	0.018
Savannah River Field Office	3	5	–	–	–	–	–	–	–	–	–	8	63%	5	0.086	0.017
SRNS Service Subs	4	14	–	–	–	–	–	–	–	–	–	18	78%	14	0.203	0.015
Swift and Staley Team	226	4	–	–	–	–	–	–	–	–	–	230	2%	4	0.051	0.013
Centerra - SR	1	3	–	–	–	–	–	–	–	–	–	4	75%	3	0.025	0.008
Battelle - Pantex	23	–	–	–	–	–	–	–	–	–	–	23	0%	–	0.000	–
Battelle - PNNL	23	–	–	–	–	–	–	–	–	–	–	23	0%	–	0.000	–
DOE Headquarters	50	–	–	–	–	–	–	–	–	–	–	50	0%	–	0.000	–
DOE-Richland Field Office	4	–	–	–	–	–	–	–	–	–	–	4	0%	–	0.000	–
LLNL Construction Subcontractors	4	–	–	–	–	–	–	–	–	–	–	4	0%	–	0.000	–
MSTS - Livermore Operations	7	–	–	–	–	–	–	–	–	–	–	7	0%	–	0.000	–
MSTS - Los Alamos	6	–	–	–	–	–	–	–	–	–	–	6	0%	–	0.000	–
Nevada	13	–	–	–	–	–	–	–	–	–	–	13	0%	–	0.000	–
NNSA Albuquerque Complex	7	–	–	–	–	–	–	–	–	–	–	7	0%	–	0.000	–
NNSA Nevada Site Office	75	–	–	–	–	–	–	–	–	–	–	75	0%	–	0.000	–
Office of Secure Transportation	2	–	–	–	–	–	–	–	–	–	–	2	0%	–	0.000	–
SRNS Construction Subs	2	–	–	–	–	–	–	–	–	–	–	2	0%	–	0.000	–
U.S. Geological Survey - Yucca	1	–	–	–	–	–	–	–	–	–	–	1	0%	–	0.000	–
UT-Battelle ORNL	13	–	–	–	–	–	–	–	–	–	–	13	0%	–	0.000	–
Washington River Protection Solutions LLC (W	4	–	–	–	–	–	–	–	–	–	–	4	0%	–	0.000	–
Totals	5,879	831	92	23	2	–	–	–	–	–	–	6,827	14%	948	42.493	0.045

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure Report for CY 2018

Exhibit B-11. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Reactor Facilities, 2018.

REACTOR FACILITIES

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

Site/Contractor	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Sandia National Laboratories	74	17	4	–	–	–	–	–	–	–	–	95	22%	21	1.163	0.006
Brookhaven National Laboratory	10	–	–	–	–	–	–	–	–	–	–	10	0%	14	-	–
Totals	84	17	4	–	–	–	–	–	–	–	–	105	20%	21	1.163	0.006

Note: Boxed values (gray background) indicate the greatest value in each column.

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Exhibit B-12. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Research, General, 2018.

RESEARCH, GENERAL

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

Site/Contractor	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
UT-Batelle ORNL	2,964	307	49	32	12	13	1	–	–	–	–	3,378	12%	414	47.480	0.115
Argonne National Laboratory	1,716	55	13	5	–	2	–	–	–	–	–	1,791	4%	75	7.112	0.095
INL - BEA LLC - Security	61	5	1	1	–	–	–	–	–	–	–	68	10%	7	0.658	0.094
INL - BEA LLC - Production	266	28	–	5	–	–	–	–	–	–	–	299	11%	33	2.316	0.070
ICP - Flour Projects (ICP and AMWTP)	490	173	47	10	–	–	–	–	–	–	–	720	32%	230	15.563	0.068
INL - BEA LLC - Research	261	36	3	4	–	–	–	–	–	–	–	304	14%	43	2.791	0.065
INL - BEA LLC - Services	3,995	501	75	34	2	–	–	–	–	–	–	4,607	13%	612	38.646	0.063
ICP - Flour Service Subcontractors ICP/AMWTP	728	336	76	11	–	–	–	–	–	–	–	1,151	37%	423	25.778	0.061
Lawrence Livermore National Laboratory	3,442	113	11	3	2	–	–	–	–	–	–	3,571	4%	129	7.405	0.057
Mid-America Conversion Services (MCS)	174	45	8	2	–	–	–	–	–	–	–	229	24%	55	3.097	0.056
Los Alamos National Laboratory	3,757	431	48	19	1	–	–	–	–	–	–	4,256	12%	499	26.486	0.053
Lawrence Berkeley Laboratory	913	20	2	–	–	–	–	–	–	–	–	935	2%	22	1.014	0.046
Isotek (Bldg 3019)	100	3	–	–	–	–	–	–	–	–	–	103	3%	3	0.134	0.045
Sandia National Laboratories	329	29	4	–	–	–	–	–	–	–	–	362	9%	33	1.437	0.044
Fluor/B&W - Portsmouth	2,105	14	–	–	–	–	–	–	–	–	–	2,119	1%	14	0.491	0.035
NNSA Los Alamos Site Office	72	3	1	–	–	–	–	–	–	–	–	76	5%	4	0.129	0.032
ICP - Fluor - Support	27	14	–	–	–	–	–	–	–	–	–	41	34%	14	0.436	0.031
Ames Laboratory	159	33	–	–	–	–	–	–	–	–	–	192	17%	33	0.935	0.028
Savannah River National Laboratory	41	256	8	2	–	–	–	–	–	–	–	307	87%	266	7.117	0.027
Battelle - PNNL	1,718	442	20	4	–	–	–	–	–	–	–	2,184	21%	466	11.806	0.025
UCOR: ORNL	410	45	1	–	–	–	–	–	–	–	–	456	10%	46	1.167	0.025
Battelle -PNNL- Subs	170	10	1	–	–	–	–	–	–	–	–	181	6%	11	0.262	0.024
Savannah River Nuclear Solutions	63	310	5	–	–	–	–	–	–	–	–	378	83%	315	7.648	0.024
Cabrera Services	4	3	–	–	–	–	–	–	–	–	–	7	43%	3	0.059	0.020
Four Rivers Nuclear Partnership (FRNP)	733	5	–	–	–	–	–	–	–	–	–	738	1%	5	0.087	0.017
Savannah River Field Office	4	6	–	–	–	–	–	–	–	–	–	10	60%	6	0.099	0.017
Oak Ridge Institute for Science & Education	69	20	–	–	–	–	–	–	–	–	–	89	22%	20	0.317	0.016
SRNS Construction	24	34	–	–	–	–	–	–	–	–	–	58	59%	34	0.535	0.016
SRNS Construction Subs	1	14	–	–	–	–	–	–	–	–	–	15	93%	14	0.229	0.016
National Strategic Protective Services: NSPS	96	1	–	–	–	–	–	–	–	–	–	97	1%	1	0.015	0.015
Univ. of Georgia Ecology Laboratory	8	21	–	–	–	–	–	–	–	–	–	29	72%	21	0.314	0.015
SRNS Service Subs	13	27	–	–	–	–	–	–	–	–	–	40	68%	27	0.371	0.014
Idaho Field Office	200	6	–	–	–	–	–	–	–	–	–	206	3%	6	0.078	0.013
Centerra - SR	23	45	–	–	–	–	–	–	–	–	–	68	66%	45	0.543	0.012
N3B	74	1	–	–	–	–	–	–	–	–	–	75	1%	1	0.012	0.012
Pacific Northwest Site Office	8	17	–	–	–	–	–	–	–	–	–	25	68%	17	0.157	0.009
SRR Operations	–	1	–	–	–	–	–	–	–	–	–	1	100%	1	0.008	0.008
Misc. DOE Contractors - SR	–	1	–	–	–	–	–	–	–	–	–	1	100%	1	0.006	0.006
National Renewable Energy Laboratory	10	1	–	–	–	–	–	–	–	–	–	11	9%	1	0.006	0.006
Brookhaven National Laboratory	1	–	–	–	–	–	–	–	–	–	–	1	0%	–	0.000	–
Portsmouth Mission Alliance (PMA)	156	–	–	–	–	–	–	–	–	–	–	156	0%	–	0.000	–
Totals	25,385	3,412	373	132	17	15	1	–	–	–	–	29,335	13%	3,950	212.744	0.054

Note: Boxed values (gray background) indicate the greatest value in each column.

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Exhibit B-13. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Research, Fusion, 2018.

RESEARCH, FUSION																
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Site/Contractor	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Sandia National Laboratories	67	8	–	–	–	–	–	–	–	–	–	75	11% ◀	8	0.268 ◀	0.034 ◀
Princeton Plasma Physics Laboratory	310	38	–	–	–	–	–	–	–	–	–	348 ◀	11% ◀	38 ◀	0.239	0.006
Totals	377	46	–	–	–	–	–	–	–	–	–	423	11%	46	0.507	0.011

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure Report for CY 2018

Exhibit B-14. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Waste Processing, 2018.

WASTE PROCESSING																
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Site/Contractor	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
West Valley Nuclear Services Inc.	255	69	45	20	20	6	–	–	–	–	–	415	39%	160	35.549	0.222
Wastren Advantage, Inc.	–	–	1	–	–	–	–	–	–	–	–	1	100%	1	0.189	0.189
TRU Waste Processing Center - ORNL	109	73	29	43	10	–	–	–	–	–	–	264	59%	155	28.186	0.182
Energy Solutions - UMTRA Project - Moab	48	60	13	4	–	–	–	–	–	–	–	125	62%	77	5.485	0.071
Los Alamos National Laboratory	135	54	13	–	–	–	–	–	–	–	–	202	33%	67	3.230	0.048
Sandia National Laboratories	34	10	1	1	–	–	–	–	–	–	–	46	26%	12	0.541	0.045
DUF6 Conversion Project - Paducah Subs	213	95	5	–	–	–	–	–	–	–	–	313	32%	100	4.442	0.044
Bechtel Construction - SR	69	396	32	5	–	–	–	–	–	–	–	502	86%	433	17.143	0.040
SRR Operations	353	1,063	107	8	–	–	–	–	–	–	–	1,531	77%	1,178	45.200	0.038
Savannah River Nuclear Solutions	206	488	30	12	–	–	–	–	–	–	–	736	72%	530	18.753	0.035
Brookhaven National Laboratory	31	3	–	–	–	–	–	–	–	–	–	34	9%	3	0.098	0.033
Washington River Protection Solutions LLC	1,502	367	16	2	–	–	–	–	–	–	–	1,887	20%	385	12.742	0.033
Centerra - SR	100	107	3	–	–	–	–	–	–	–	–	210	52%	110	2.822	0.026
Santa Fe Protective Services (WIPP)	1	1	–	–	–	–	–	–	–	–	–	2	50%	1	0.023	0.023
Savannah River National Laboratory	3	7	–	–	–	–	–	–	–	–	–	10	70%	7	0.156	0.022
Washington TRU Solutions LLC-WIPP	500	36	–	–	–	–	–	–	–	–	–	536	7%	36	0.787	0.022
SPRU-NY (Building remediation)	91	10	–	–	–	–	–	–	–	–	–	101	10%	10	0.208	0.021
SRR Service Subs	16	19	–	–	–	–	–	–	–	–	–	35	54%	19	0.378	0.020
WTS Subcontractors - WIPP	51	5	–	–	–	–	–	–	–	–	–	56	9%	5	0.099	0.020
Misc. S.R.S. Const. Subcontractors	2	10	–	–	–	–	–	–	–	–	–	12	83%	10	0.183	0.018
SRNS Construction	26	27	–	–	–	–	–	–	–	–	–	53	51%	27	0.412	0.015
Savannah River Field Office	19	24	–	–	–	–	–	–	–	–	–	43	56%	24	0.315	0.013
SRNS Service Subs	31	30	–	–	–	–	–	–	–	–	–	61	49%	30	0.385	0.013
Parsons Subcontractors	4	4	–	–	–	–	–	–	–	–	–	8	50%	4	0.038	0.010
SRNS Construction Subs	–	4	–	–	–	–	–	–	–	–	–	4	100%	4	0.037	0.009
Parsons	3	2	–	–	–	–	–	–	–	–	–	5	40%	2	0.013	0.007
Misc. DOE Contractors - SR	1	1	–	–	–	–	–	–	–	–	–	2	50%	1	0.005	0.005
Carlsbad Field Office	23	–	–	–	–	–	–	–	–	–	–	23	0%	–	0.000	–
CH2M Hill Plateau Remediation Company (CHPRC)	10	–	–	–	–	–	–	–	–	–	–	10	0%	–	0.000	–
Los Alamos National Lab - WIPP	3	–	–	–	–	–	–	–	–	–	–	3	0%	–	0.000	–
Mission Support Alliance	1	–	–	–	–	–	–	–	–	–	–	1	0%	–	0.000	–
N3B	3	–	–	–	–	–	–	–	–	–	–	3	0%	–	0.000	–
NNSA Los Alamos Site Office	3	–	–	–	–	–	–	–	–	–	–	3	0%	–	0.000	–
Totals	3,846	2,965	295	95	30	6	–	–	–	–	–	7,237	47%	3,391	177.419	0.052

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure Report for CY 2018

Exhibit B-15. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Weapons Fabrication, 2018.

WEAPONS FABRICATION																	
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																	
Site/Contractor	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)	
Los Alamos National Laboratory	1,421	562	220	109	34	17	14	-	-	-	-	2,377	40%	956	146.641	0.153	
CNS, LLC - Pantex	4,121	241	43	21	3	-	-	-	-	-	-	4,429	7%	308	22.881	0.074	
CNS, LLC - Y-12	4,183	1,328	168	15	1	-	-	-	-	-	-	5,695	27%	1,512	65.131	0.043	
Savannah River Nuclear Solutions	1	2	-	-	-	-	-	-	-	-	-	3	67%	2	0.068	0.034	
Savannah River Field Office	5	4	-	-	-	-	-	-	-	-	-	9	44%	4	0.126	0.032	
URS/CH2MHill - Oak Ridge (UCOR): Y-12	95	4	-	-	-	-	-	-	-	-	-	99	4%	4	0.103	0.026	
Office of Secure Transportation	282	13	-	-	-	-	-	-	-	-	-	295	4%	13	0.260	0.020	
Sandia National Laboratories	127	8	-	-	-	-	-	-	-	-	-	135	6%	8	0.132	0.017	
Tritium Extraction Facility	160	187	-	-	-	-	-	-	-	-	-	347	54%	187	3.035	0.016	
CNS, LLC - Security	512	1	-	-	-	-	-	-	-	-	-	513	0%	1	0.013	0.013	
SRNS Construction	15	28	-	-	-	-	-	-	-	-	-	43	65%	28	0.376	0.013	
Pantex Plant Construction Subcontr	46	3	-	-	-	-	-	-	-	-	-	49	6%	3	0.033	0.011	
Parsons	6	13	-	-	-	-	-	-	-	-	-	19	68%	13	0.144	0.011	
Savannah River National Laboratory	19	4	-	-	-	-	-	-	-	-	-	23	17%	4	0.040	0.010	
Kansas City National Security Campus	106	58	-	-	-	-	-	-	-	-	-	164	35%	58	0.428	0.007	
NNSA Los Alamos Site Office	3	-	-	-	-	-	-	-	-	-	-	3	0%	-	0.000	-	
SRR Service Subs	1	-	-	-	-	-	-	-	-	-	-	1	0%	-	0.000	-	
N3B	2	-	-	-	-	-	-	-	-	-	-	2	0%	-	0.000	-	
NNSA Production Office - Pantex Site	25	-	-	-	-	-	-	-	-	-	-	25	0%	-	0.000	-	
Totals	11,130	2,456	431	145	38	17	14	-	-	-	-	14,231	22%	3,101	239.411	0.077	

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure Report for CY 2018

Exhibit B-16. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Other, 2018.

OTHER																
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Site/Contractor	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
NNSA Los Alamos Site Office	77	-	1	-	-	-	-	-	-	-	-	78	1%	1	0.135	0.135
CH2M Hill Plateau Remediation Company (CHPRC)	486	66	4	4	6	1	-	-	-	-	-	567	14%	81	7.722	0.095
Wastren Advantage, Inc.	41	25	3	2	-	-	-	-	-	-	-	71	42%	30	2.190	0.073
Washington River Protection Solutions LLC	574	113	25	9	-	-	-	-	-	-	-	721	20%	147	9.703	0.066
Los Alamos National Laboratory	2,642	137	14	6	1	-	-	-	-	-	-	2,800	6%	158	8.298	0.053
SRNS Service Subs	59	22	4	-	-	-	-	-	-	-	-	85	31%	26	1.101	0.042
Savannah River National Laboratory	3	4	-	-	-	-	-	-	-	-	-	7	57%	4	0.116	0.029
Office of Secure Transportation	21	1	-	-	-	-	-	-	-	-	-	22	5%	1	0.028	0.028
Bechtel Construction - SR	-	2	-	-	-	-	-	-	-	-	-	2	100%	2	0.050	0.025
N3B	211	9	-	-	-	-	-	-	-	-	-	220	4%	9	0.202	0.022
Sandia National Laboratories	306	31	1	-	-	-	-	-	-	-	-	338	9%	32	0.676	0.021
Savannah River Field Office	24	12	-	-	-	-	-	-	-	-	-	36	33%	12	0.251	0.021
Savannah River Nuclear Solutions	314	255	4	-	-	-	-	-	-	-	-	573	45%	259	4.476	0.017
SRNS Construction Subs	6	1	-	-	-	-	-	-	-	-	-	7	14%	1	0.017	0.017
Univ. of Georgia Ecology Laboratory	5	8	-	-	-	-	-	-	-	-	-	13	62%	8	0.135	0.017
Navarro Research & Engineering	5	22	-	-	-	-	-	-	-	-	-	27	81%	22	0.336	0.015
Office of River Protection	87	7	-	-	-	-	-	-	-	-	-	94	7%	7	0.102	0.015
SRR Operations	2	3	-	-	-	-	-	-	-	-	-	5	60%	3	0.043	0.014
DOE-Richland Field Office	379	26	-	-	-	-	-	-	-	-	-	405	6%	26	0.350	0.013
SRNS Construction	84	36	-	-	-	-	-	-	-	-	-	120	30%	36	0.470	0.013
Mission Support Alliance	92	6	-	-	-	-	-	-	-	-	-	98	6%	6	0.073	0.012
Misc. DOE Contractors - SR	3	2	-	-	-	-	-	-	-	-	-	5	40%	2	0.020	0.010
Centerra - SR	33	19	-	-	-	-	-	-	-	-	-	52	37%	19	0.168	0.009
Bechtel National Corporation	21	-	-	-	-	-	-	-	-	-	-	21	0%	-	0.000	-
HPMC Occupational Medical Services	25	-	-	-	-	-	-	-	-	-	-	25	0%	-	0.000	-
Misc. S.R.S. Const. Subcontractors	1	-	-	-	-	-	-	-	-	-	-	1	0%	-	0.000	-
SRR Service Subs	3	-	-	-	-	-	-	-	-	-	-	3	0%	-	0.000	-
Totals	5,504	807	56	21	7	1	-	-	-	-	-	6,396	14%	892	36.662	0.041

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure Report for CY 2018
Exhibit B-17. Internal Dose by Facility Type and Nuclide, 2016–2018.

Facility Type	Nuclide*	No. of Individuals with Measurable CED** 2016	No. of Individuals with Measurable CED** 2017	No. of Individuals with Measurable CED** 2018	Collective CED Dose (person-rem) 2016	Collective CED Dose (person-rem) 2017	Collective CED Dose (person-rem) 2018	Average Measurable CED (rem) 2016	Average Measurable CED (rem) 2017	Average Measurable CED (rem) 2018
Accelerator	Total	–	–	–	–	–	–	–	–	–
Fuel Fabrication	Total	–	–	–	–	–	–	–	–	–
Fuel Processing	Plutonium	4	–	–	0.016	–	–	0.004	–	–
	Total	4	–	–	0.016	–	–	0.004	–	–
Fuel/Uranium Enrichment	Total	–	–	–	–	–	–	–	–	–
Maintenance and Support	Americium	2	20	–	0.014	0.091	–	0.007	0.005	–
	Hydrogen-3	16	2	–	0.042	0.004	–	0.003	0.002	–
	Other	–	–	1	–	–	0.007	–	–	0.007
	Plutonium	–	2	–	–	0.011	–	–	0.006	–
	Uranium	12	9	–	0.068	0.058	–	0.006	0.006	–
	Total	30	33	1	0.124	0.164	0.007	0.004	0.005	0.007
Other	Hydrogen-3	1	–	–	0.001	–	–	0.001	–	–
	Other	–	–	1	–	–	0.001	–	–	0.001
	Plutonium	1	–	–	0.002	–	–	0.002	–	–
	Total	2	–	1	0.003	–	0.001	0.002	–	0.001
Reactor	Total	–	–	–	–	–	–	–	–	–
Research, Fusion	Total	–	–	–	–	–	–	–	–	–
Research, General	Americium	2	3	–	0.065	0.063	–	0.033	0.021	–
	Hydrogen-3	4	–	7	0.025	–	0.052	0.006	–	0.007
	Mixed	–	–	1	–	–	0.087	–	–	0.087 ◀
	Other	–	2	1	–	0.057	0.019	–	0.029	0.019
	Polonium	1	–	–	0.024	–	–	0.024	–	–
	Uranium	9	9	19	0.211	0.543	0.219	0.023	0.060	0.012
	Total	18	14	28	0.354	0.663	0.377	0.020	0.047	0.014
Waste Processing/Mgmt.	Other	1	3	4	0.001	0.183	0.007	0.001	0.061 ◀	0.002
	Uranium	54	29	29	1.876	0.947	0.828	0.035	0.033	0.029
	Total	55	32	33	1.877	1.130	0.835	0.034	0.035	0.025
Weapons Fab. and Testing	Hydrogen-3	2	1	3	0.005	0.004	0.008	0.003	0.004	0.003
	Mixed	19	13	14	0.296	0.193	0.196	0.016	0.015	0.014
	Uranium	1,111 ◀	1,194 ◀	1,251 ◀	58.869 ◀	63.769 ◀	53.740 ◀	0.053 ◀	0.053	0.043
	Total	1,132	1,208	1,268	59.170	63.966	53.944	0.052	0.053	0.043
	Totals	1,239	1,287	1,331	61.544	65.923	55.164	0.050	0.051	0.041

Note: Boxed values (gray background) indicate the greatest value in each column.

*Intakes grouped by nuclide. Intakes involving multiple nuclides were grouped into "mixed." Nuclides where fewer than 10 individuals had intakes were grouped as "other."

**The number of internal depositions represents the number of internal dose records with positive results reported for each individual.

DOE Occupational Radiation Exposure Report for CY 2018

Exhibit B-18a. Distribution of TED by Labor Category, 2016.

TOTAL EFFECTIVE DOSE (TED)

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

Labor Category	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Agriculture	80	1	–	–	–	–	–	–	–	–	–	81	1%	1	0.005	0.005
Construction/Repair	3,300	1,228	178	46	3	–	–	–	–	–	–	4,755	31%	1,455	77.708	0.053
Laborers	917	309	67	45	1	–	–	–	–	–	–	1,339	32%	422	35.875	0.085
Management	6,697	1,023	41	9	–	1	–	–	–	–	–	7,771	14%	1,074	30.116	0.028
Miscellaneous	4,615	409	81	21	2	–	1	–	–	–	–	5,129	10%	514	34.509	0.067
Production	2,472	1,077	246	137	32	5	1	–	–	–	–	3,970	38%	1,498	145.606	0.097
Professional/Scientists	18,154	2,547	154	32	7	2	–	–	–	–	–	20,896	13%	2,742	92.100	0.034
Service Workers	5,253	789	48	16	–	–	–	–	–	–	–	6,106	14%	853	30.225	0.035
Technicians	7,194	1,607	377	136	41	29	18	–	–	–	–	9,402	24%	2,208	228.022	0.103
Transport Workers	999	120	17	4	3	1	–	–	–	–	–	1,144	13%	145	9.587	0.066
Unknown	16,168	1,032	37	5	1	–	–	–	–	–	–	17,243	6%	1,075	25.113	0.023
Totals	65,849	10,142	1,246	451	90	38	20	–	–	–	–	77,836	15%	11,987	708.866	0.059

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure Report for CY 2018
Exhibit B-18b. Distribution of TED by Labor Category, 2017.

TOTAL EFFECTIVE DOSE (TED)																
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Labor Category	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Agriculture	75	–	–	–	–	–	–	–	–	–	–	75	–	–	–	–
Construction/Repair	3,350	1,306	218	59	11	–	–	–	–	–	–	4,944	32%	1,594	96.104	0.060
Laborers	936	261	69	33	–	–	–	–	–	–	–	1,299	28%	363	30.504	0.084
Management	6,353	1,176	45	17	4	–	–	–	–	–	–	7,595	16%	1,242	38.804	0.031
Miscellaneous	4,625	575	98	22	2	–	1	–	–	–	–	5,323	13%	698	40.182	0.058
Production	2,209	1,128	249	116	40	1	–	–	–	–	–	3,743	41% ◀	1,534	139.643	0.091
Professional/Scientists	18,686	3,232	190	55	7	2	7	–	–	–	–	22,179 ◀	16%	3,493 ◀	132.978	0.038
Service Workers	5,827	771	49	9	–	–	–	–	–	–	–	6,656	12%	829	28.185	0.034
Technicians	7,157	1,666	381	147	38	10	12	–	–	–	–	9,411	24%	2,254	208.882 ◀	0.093 ◀
Transport Workers	793	98	10	9	–	–	–	–	–	–	–	910	13%	117	7.969	0.068
Unknown	16,868	798	87	13	1	–	1	–	–	–	–	17,768	5%	900	38.145	0.043
Totals	66,879	11,011	1,396	480	103	13	21	–	–	–	–	79,903	16%	13,024	761.396	0.058

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure Report for CY 2018

Exhibit B-18c. Distribution of TED by Labor Category, 2018.

TOTAL EFFECTIVE DOSE (TED)																
Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Labor Category	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Agriculture	59	–	–	–	–	–	–	–	–	–	–	59	0%	–	0.000	–
Construction/Repair	3,176	1,361	158	37	2	–	–	–	–	–	–	4,734	33%	1,558	72.309	0.046
Laborers	928	285	63	21	5	1	–	–	–	–	–	1,303	29%	375	28.918	0.077
Management	5,407	1,064	62	10	2	–	–	–	–	–	–	6,545	17%	1,138	34.798	0.031
Miscellaneous	8,216	1,282	121	31	1	1	–	–	–	–	–	9,652	15%	1,436	61.884	0.043
Production	2,309	1,121	237	95	37	7	–	–	–	–	–	3,806	39%	1,497	134.823	0.090
Professional/Scientists	18,256	3,140	211	55	12	5	–	–	–	–	–	21,679	16%	3,423	130.564	0.038
Service Workers	5,668	826	54	18	–	–	–	–	–	–	–	6,566	14%	898	32.953	0.037
Technicians	5,737	1,705	381	148	35	25	15	–	–	–	–	8,046	29%	2,309	223.181	0.097
Transport Workers	845	110	15	5	1	–	–	–	–	–	–	976	13%	131	8.523	0.065
Unknown	11,685	511	34	8	2	–	–	–	–	–	–	12,240	5%	555	20.642	0.037
Totals	62,286	11,405	1,336	428	97	39	15	–	–	–	–	75,606	18%	13,320	748.595	0.056

Note: Boxed values (gray background) indicate the greatest value in each column.

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Exhibit B-19. Internal Dose by Labor Category, 2016–2018.

Labor Category	No. of Individuals with Measurable CED* 2016	No. of Individuals with Measurable CED* 2017	No. of Individuals with Measurable CED* 2018	Collective CED Dose (person-rem) 2016	Collective CED Dose (person-rem) 2017	Collective CED Dose (person-rem) 2018	Average Measurable CED (rem) 2016	Average Measurable CED (rem) 2017	Average Measurable CED (rem) 2018
Construction/Repair	230	224	265	9.481	8.923	9.508	0.041	0.040	0.036
Laborers	68	72	80	6.752	6.470	5.030	0.099 ◀	0.090 ◀	0.063 ◀
Management	93	91	102	4.319	6.213	5.937	0.046	0.068	0.058
Miscellaneous	18	8	9	0.314	0.140	0.174	0.017	0.018	0.019
Production	345 ◀	352 ◀	374 ◀	22.435 ◀	22.434 ◀	18.173 ◀	0.065	0.064	0.049
Professional/Scientists	181	188	196	5.783	6.814	6.124	0.032	0.036	0.031
Service Workers	35	43	37	1.530	2.515	1.463	0.044	0.058	0.040
Technicians	129	115	107	5.635	5.590	3.830	0.044	0.049	0.036
Transport Workers	27	19	20	1.200	0.678	0.647	0.044	0.036	0.032
Unknown	115	175	143	4.095	6.146	4.312	0.036	0.035	0.030
Totals	1,241	1,287	1,333	61.544	65.923	55.198	0.050	0.051	0.041

Note: Boxed values (gray background) indicate the greatest value in each column.

*The number of internal depositions represents the number of internal dose records with positive results reported for each individual.

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Exhibit B-20. Dose Distribution by Labor Category and Occupation, 2018.

Labor Category	Occupation	Less than Meas.	Meas. to 0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Monitored	Percent of Monitored with Meas. TED	No. with Meas. TED	Collective TED (Person-rem)	Avg. Meas. TED (rem)
Agriculture	Forest Workers	2	–	–	–	–	–	–	–	–	–	–	2	0%	–	0.000	–
	Groundskeepers	38	–	–	–	–	–	–	–	–	–	–	38	0%	–	0.000	–
	Misc. Agriculture	19	–	–	–	–	–	–	–	–	–	–	19	0%	–	0.000	–
Construction/Repair	Carpenters	270	107	19	4	–	–	–	–	–	–	–	400	33%	130	7.302	0.056
	Electricians	1,079	359	36	15	1	–	–	–	–	–	–	1,490	28%	411	19.358	0.047
	Masons	16	15	–	–	–	–	–	–	–	–	–	31	48%	15	0.342	0.023
	Mechanics/Repairers	441	189	25	1	–	–	–	–	–	–	–	656	33%	215	9.353	0.044
	Miners/Drillers	82	3	–	–	–	–	–	–	–	–	–	85	4%	3	0.059	0.020
	Misc. Repair/Construction	750	477	40	9	1	–	–	–	–	–	–	1,277	41%	527	21.765	0.041
	Painters	127	46	4	–	–	–	–	–	–	–	–	177	28%	50	1.874	0.037
	Pipe Fitter	411	165	34	8	–	–	–	–	–	–	–	618	33%	207	12.256	0.059
Laborers	Handlers/Laborers/Helpers	928	285	63	21	5	1	–	–	–	–	–	1,303	29%	375	28.918	0.077
Management	Admin. Support & Clerical Sec.	868	97	3	–	–	–	–	–	–	–	–	968	10%	100	2.023	0.020
	Manager - Administrator	4,513	966	59	10	2	–	–	–	–	–	–	5,550	19%	1,037	32.770	0.032
	Sales	26	1	–	–	–	–	–	–	–	–	–	27	4%	1	0.005	0.005
Miscellaneous	Military	73	–	–	–	–	–	–	–	–	–	–	73	0%	–	0.000	–
	Miscellaneous	8,143	1,282	121	31	1	1	–	–	–	–	–	9,579	15%	1,436	61.884	0.043
Production	Machine Setup/Operators	140	163	54	3	–	–	–	–	–	–	–	360	61%	220	15.377	0.070
	Machinists	113	18	5	2	2	–	–	–	–	–	–	140	19%	27	3.287	0.122
	Misc. Precision/Production	475	231	38	6	–	–	–	–	–	–	–	750	37%	275	14.696	0.053
	Operators, Plant/ System/Util.	1,308	613	121	81	30	7	–	–	–	–	–	2,160	39%	852	91.671	0.108
	Sheet Metal Workers	246	88	18	3	5	–	–	–	–	–	–	360	32%	114	9.419	0.083
	Welders and Solderers	27	8	1	–	–	–	–	–	–	–	–	36	25%	9	0.373	0.041
Professional/Scientists	Doctors and Nurses	34	–	–	–	–	–	–	–	–	–	–	34	0%	–	0.000	–
	Engineer	5,267	958	54	19	7	3	–	–	–	–	–	6,308	17%	1,041	41.581	0.040
	Health Physicist	316	74	12	2	–	–	–	–	–	–	–	404	22%	88	4.121	0.047
	Misc. Professional	7,711	1,552	116	26	3	–	–	–	–	–	–	9,408	18%	1,697	62.102	0.037
	Scientist	4,928	556	29	8	2	2	–	–	–	–	–	5,525	11%	597	22.760	0.038
Service Workers	Firefighters	545	46	2	–	–	–	–	–	–	–	–	593	8%	48	1.039	0.022
	Food Service Employees	2	1	–	–	–	–	–	–	–	–	–	3	33%	1	0.014	0.014
	Janitors	243	18	2	–	–	–	–	–	–	–	–	263	8%	20	0.753	0.038
	Misc. Service	3,164	435	44	18	–	–	–	–	–	–	–	3,661	14%	497	24.685	0.050
	Security Guards	1,714	326	6	–	–	–	–	–	–	–	–	2,046	16%	332	6.462	0.019
Technicians	Engineering Technicians	1,483	211	43	10	4	–	–	–	–	–	–	1,751	15%	268	18.578	0.069
	Health Technicians	151	25	6	4	–	–	–	–	–	–	–	186	19%	35	2.636	0.075
	Misc. Technicians	1,583	384	60	28	4	5	1	–	–	–	–	2,065	23%	482	36.701	0.076
	Radiation Monitors/Techs.	972	705	181	51	11	9	3	–	–	–	–	1,932	50%	960	85.557	0.089
	Science Technicians	616	252	66	54	16	11	11	–	–	–	–	1,026	40%	410	71.938	0.175
	Technicians	932	128	25	1	–	–	–	–	–	–	–	1,086	14%	154	7.771	0.050
Transport Workers	Bus Drivers	2	–	–	–	–	–	–	–	–	–	–	2	0%	–	0.000	–
	Equipment Operators	128	54	9	5	1	–	–	–	–	–	–	197	35%	69	5.798	0.084
	Misc. Transport	341	26	–	–	–	–	–	–	–	–	–	367	7%	26	0.743	0.029
	Pilots	7	–	–	–	–	–	–	–	–	–	–	7	0%	–	0.000	–
	Truck Drivers	367	30	6	–	–	–	–	–	–	–	–	403	9%	36	1.982	0.055
Unknown	Unknown	11,685	511	34	8	2	–	–	–	–	–	–	12,240	5%	555	20.642	0.037
Totals		62,286	11,405	1,336	428	97	39	15	–	–	–	–	75,606	18%	13,320	748.595	0.056

Note: Boxed values (gray background) indicate the greatest value in each column.

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Exhibit B-21. Internal Dose Distribution by Site and Nuclide, 2018.

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)																
Site	Nuclide*	Meas. to 0.020	0.020–0.100	0.100–0.250	0.250–0.500	0.500–0.750	0.750–1.000	1.0–2.0	2.0–3.0	3.0–4.0	4.0–5.0	>5.0	Total Indiv. with Meas. CED	Collective CED (person-rem)	Avg. CED (rem)	
Hanford: Pacific Northwest National Laboratory	Hydrogen-3	4	–	–	–	–	–	–	–	–	–	–	4	0.007	0.002	
Idaho National Laboratory	Mixed	–	1	–	–	–	–	–	–	–	–	–	1	0.087	0.087 ◀	
Idaho National Laboratory	Uranium	–	1	–	–	–	–	–	–	–	–	–	1	0.084	0.084	
Lawrence Livermore National Laboratory	Hydrogen-3	1	–	–	–	–	–	–	–	–	–	–	1	0.011	0.011	
Lawrence Livermore National Laboratory	Other	2	–	–	–	–	–	–	–	–	–	–	2	0.034	0.017	
Los Alamos National Laboratory	Hydrogen-3	1	–	–	–	–	–	–	–	–	–	–	1	0.001	0.001	
Los Alamos National Laboratory	Uranium	13	–	–	–	–	–	–	–	–	–	–	13	0.048	0.004	
Oak Ridge: Oak Ridge National Laboratory	Hydrogen-3	2	–	–	–	–	–	–	–	–	–	–	2	0.034	0.017	
Oak Ridge: Oak Ridge National Laboratory	Uranium	1	–	–	–	–	–	–	–	–	–	–	1	0.011	0.011	
Oak Ridge: Y-12 National Security Complex	Mixed	10	4	–	–	–	–	–	–	–	–	–	14	0.196	0.014	
Oak Ridge: Y-12 National Security Complex	Uranium	572	522	143	13	1	–	–	–	–	–	–	1,251 ◀	53.740 ◀	0.043	
Paducah Gaseous Diffusion Plant	Uranium	2	2	–	–	–	–	–	–	–	–	–	4	0.076	0.019	
Sandia National Laboratories	Other	7	–	–	–	–	–	–	–	–	–	–	7	0.034	0.005	
Savannah River Site	Hydrogen-3	2	–	–	–	–	–	–	–	–	–	–	2	0.007	0.004	
Uranium Mill Tailings Remedial Action Project	Uranium	13	16	–	–	–	–	–	–	–	–	–	29	0.828	0.029	
Totals		630	546	143	13	1	–	–	–	–	–	–	1,333	55.198	0.041	

Note: Boxed values (gray background) indicate the greatest value in each column.

*Intakes grouped by nuclide. Intakes involving multiple nuclides were grouped into "mixed." Nuclides where fewer than 10 individuals had intakes were grouped as "other."

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Exhibit B-22. Extremity Dose Distribution by Site, 2018.

Site	No. Meas. Dose	Meas. to 0.100	0.100–1.0	1.0–5.0	5.0–10.0	10.0–20.0	20.0–30.0	>30.0	Total Monitored*	No. with Meas.	No. Above Monitoring Threshold (5 rems)**	Collective Extremity Dose (person-rem)	Avg. Meas. Extremity Dose (rem)
Ames Laboratory	63	129	–	–	–	–	–	–	192	129	–	4.299	0.033
Argonne National Laboratory	1,699	70	16	4	2	–	–	–	1,791	92	2	27.972	0.304
Brookhaven National Laboratory	3,968	14	17	2	1	–	–	–	4,002	34	1	15.993	0.470
Energy Technology Engineering Center	7	–	–	–	–	–	–	–	7	–	–	0.000	–
Fermi National Accelerator Laboratory	1,447	6	1	–	–	–	–	–	1,454	7	–	0.316	0.045
Grand Junction Site	27	–	–	–	–	–	–	–	27	–	–	0.000	–
Hanford: Hanford Site	3,509	62	69	29	–	–	–	–	3,669	160	–	74.407	0.465
Hanford: Office of River Protection	2,282	255	240	22	–	–	–	–	2,799	517	–	123.337	0.239
Hanford: Pacific Northwest National Laboratory	1,892	460	55	5	1	–	–	–	2,413	521	1	40.887	0.078
Idaho National Laboratory	5,949	1037	359	46	5	–	–	–	7,396	1,447	5	239.938	0.166
Kansas City National Security Plant	114	50	–	–	–	–	–	–	164	50	–	1.111	0.022
Lawrence Berkeley National Laboratory	904	10	15	6	–	–	–	–	935	31	–	23.13	0.746
Lawrence Livermore National Laboratory	3,707	11	25	5	–	–	–	–	3,748	41	–	19.292	0.471
Los Alamos National Laboratory	9,827	1329	506	151	22	1	–	–	11,836 ◀	2,009 ◀	23 ◀	660.691 ◀	0.329
National Renewable Energy Laboratory	–	11	–	–	–	–	–	–	11	11	–	0.300	0.027
Nevada National Security Site	1,411	3	1	–	–	–	–	–	1,415	4	–	0.249	0.062
Oak Ridge: East Tennessee Technology Park	360	–	–	–	–	–	–	–	360	–	–	0.000	–
Oak Ridge: Oak Ridge Institute for Science and Education	89	–	–	–	–	–	–	–	89	–	–	0.000	–
Oak Ridge: Oak Ridge National Laboratory	3,974	29	57	38	12	1	–	–	4,111	137	13	219.809	1.604 ◀
Oak Ridge: Y-12 National Security Complex	5,746	10	24	14	–	–	–	–	5,794	48	–	40.21	0.838
Office of Secure Transportation	319	–	–	–	–	–	–	–	319	–	–	0.000	–
Paducah Gaseous Diffusion Plant	1,281	–	–	–	–	–	–	–	1,281	–	–	0.000	–
Pantex Plant	4,838	73	94	34	–	–	–	–	5,039	201	–	114.988	0.572
Portsmouth Gaseous Diffusion Plant	2,503	1	–	–	–	–	–	–	2,504	1	–	0.047	0.047
Princeton Plasma Physics Laboratory	347	1	–	–	–	–	–	–	348	1	–	0.014	0.014
Sandia National Laboratories	1,878	–	–	–	–	–	–	–	1,878	–	–	0.000	–
Savannah River National Lab	315	28	32	8	–	–	–	–	383	68	–	25.144	0.370
Savannah River Site	5,378	300	465	65	2	1	–	–	6,211	833	3	306.329	0.368
Separations Process Research Unit	101	–	–	–	–	–	–	–	101	–	–	0.000	–
SLAC National Accelerator Laboratory	2,650	–	–	–	–	–	–	–	2,650	–	–	0.000	–
Thomas Jefferson National Accelerator Facility	1,262	–	–	–	–	–	–	–	1,262	–	–	0.000	–
Uranium Mill Tailings Remedial Action Project	125	–	–	–	–	–	–	–	125	–	–	0.000	–
Waste Isolation Pilot Plant	594	–	–	–	–	–	–	–	594	–	–	0.000	–
West Valley Demonstration Project	369	14	32	–	–	–	–	–	415	46	–	10.41	0.226
Service Center Personnel***	283	–	–	–	–	–	–	–	283	–	–	0.000	–
Totals	69,218	3,903	2,008	429	45	3	–	–	75,606	6,388	48	1,948.873	0.305

Note: Boxed values (gray background) indicate the greatest value in each column.

* Represents the total number of monitoring records. The number of individuals provided extremity monitoring cannot be determined.

** All extremity doses above 5 rems were for the upper extremities (hands and forearms). DOE annual limit for extremities is 50 rems.

10 CFR 835.402(a)(1)(ii) requires extremity monitoring for a shallow dose equivalent to the skin or extremity of 5 rems or more in a year.

*** Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP.