

Hazard and Risk Analysis & Management

SHEMP Operations Manual for Laboratories

Engineering Controls

Management and Administration

Laboratory Emergency Management

**Protective Clothing
and Equipment**

**Laboratory
SHE Programs**

Work Practice Controls

June, 1998



SHEMP Operations Manual for Laboratories Contents

Tab Title (Section Color)

Introduction (White)

A. Management and Administration (Light Blue)

- A1. Introduction
- A2. Management Leadership and Employee Involvement
- A3. Contractors and Visitors
- A4. Recordkeeping and Document Control
- A5. Evaluation of Program Effectiveness

B. Hazard and Risk Analysis & Management (Yellow)

- B1. Introduction
- B2. Hazard Identification
- B3. Risk Assessment
- B4. Change Management

C. Laboratory SHE Programs (Green)

- C1. Introduction
- C2. Medical Surveillance Program
- C3. SHE Training Program
- C4. Chemical Hygiene Program
- C5. Industrial Hygiene Program
- C6. Radiation Safety Program
- C7. Biosafety Program
- C8. Ergonomics Program
- C9. Pollution Prevention Program
- C10. Air Quality Program
- C11. EPCRA Program
- C12. Wastewater Program
- C13. SPCC Program
- C14. Waste Management Program
- C15. TSCA Program
- C16. UST Program

D. Engineering Controls (Grey)

- D1. Introduction
- D2. General Laboratory Design
- D3. Process Change
- D4. Ventilation
- D5. Hazard-Specific Controls

SHEMP Operations Manual for Laboratories Contents

Analysis & Management

Tab Title (Section Color)

E. Protective Clothing and Equipment (Blue)

- E1. Introduction
- E2. Personal Protective Equipment
- E3. Respiratory Protection
- E4. Emergency Eyewashes and Showers

F. Work Practice Controls (Orange)

- F1. Introduction
- F2. General Work Practice Controls
- F3. Work Practice Controls for Chemicals

G. Laboratory Emergency Management (Red)

- G1. Introduction
- G2. Emergency Planning
- G3. Emergency Action
- G4. Investigation and Analysis

Bibliography (Purple)

Acronyms (Light Yellow)

Glossary (Light Amber)

Subject Index (Light Green)

Protective Clothing
and Equipment

Work Practice Controls

SHEMP Operations Manual for Laboratories

A Message from the SHEM Managing Director

Safety, Health and Environmental Management Programs are the highest priority throughout EPA. As public sector leaders in environmental management, EPA strives to “set the standard” for excellence, addressing our employees’ well-being in the process.

The EPA SHEM Division has long been committed to managing Safety, Health and Environmental Division risks throughout our varied operations. This document represents a major step forward as we continuously strive to strengthen the risk management of our laboratory operations. It provides guidance on management and administration, hazard identification and evaluation, laboratory Safety, Health and Environmental Division programs, engineering controls, protective clothing and equipment, work practice controls and laboratory emergency situations.

An integral part of the development of this guidance tool was our partnership with selected Safety, Health and Environmental Division leaders in the “laboratory community,” each with their own unique background and specialization. A draft copy of this document was critiqued by them as part of an extensive peer review process. That resulted in valuable insights and recommendations that have helped “chart the course” towards the development of a document that reflects both technical excellence and a practicality that will facilitate reference and utility.

A fundamental element of our successful risk management is the transfer and sharing of information and knowledge. The EPA SHEMP Operations Manual for Laboratories supports that objective. We look forward to collaborating with our partners within the EPA, in other public agencies, and in the private sector to update and expand this knowledge-base so that we can minimize risk to our staff and the environment.

Julius Jimeno
Managing Director
EPA SHEM Division

SHEMP Operations Manual for Laboratories

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49 CFR Part 173	Shippers—General Requirements for Shipments and Packaging
49 CFR Part 177	Carriage by Public Highway
Environmental Protection Agency (EPA)	
40 CFR 50-80	Clean Air Act
40 CFR 60, Subpart A	General Provisions
40 CFR 60, Subpart Db	Standards of Performance for Industrial/Commercial/Institutional Steam Generating Units
40 CFR 60, Subpart Dc	Standards of Performance for Small Industrial/Commercial/ Institutional Steam Generating Units
40 CFR 61, Subpart A	General Provisions
40 CFR 61, Subpart I	National Emission Standards for Radionuclide Emissions from Federal Facilities Other than Nuclear Regulatory Commission Licensees and Not Covered by Subpart H
40 CFR 61, Subpart M	National Emission Standard for Asbestos
40 CFR 68	Risk Management Program
40 CFR 70	Federal Operating Permit Program
40 CFR 71	State Operating Permit Program
40 CFR 82	Protection of Stratospheric Ozone
40 CFR 100-140, 400-470	Clean Water Act
40 CFR 112	Oil Pollution Prevention
40 CFR 122	EPA Administered Permit Programs: The National Pollutant Discharge Elimination System
40 CFR 240-271	Resource Conservation and Recovery Act
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste

SHEMP Operations Manual for Laboratories

Bibliography

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Environmental Protection Agency (EPA) (continued)	
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 272	Approved State Hazardous Waste Management Programs
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
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50 CFR 161	Performance Standard for Laser Products, 1985
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21 CFR Chapter 1	Regulations for the Administration and Enforcement of the Radiation Control For Health and Safety Act of 1968 (Lasers), 1968
Nuclear Regulatory Commission (NRC)	
10 CFR 19	Notices, Instructions and Reports to Workers; Inspection and Investigations
10 CFR 20	Standards for Protection Against Radiation
10 CFR 30	Rules of General Applicability to Domestic Licensing of Byproduct Material
10 CFR 71	Packaging and Transportation of Radioactive Materials
Occupational Safety and Health Administration (OSHA)	
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29 CFR 1910	Occupational Safety and Health Standards for the General Industry
29 CFR 1910.20	Access to Employee Exposure and Medical Records
29 CFR 1910.38	Employee Emergency Plans and Fire Prevention Plans
29 CFR 1910.95	Occupational Noise Exposure
29 CFR 1910.97	Ionizing Radiation Standards

SHEMP Operations Manual for Laboratories

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29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
29 CFR 1910.132	General Requirements: Personal Protective Equipment
29 CFR 1910.133	Eye and Face Protection
29 CFR 1910.134	Respiratory Protection
29 CFR 1910.135	Head Protection
29 CFR 1910.136	Foot Protection
29 CFR 1910.157	Portable Fire Extinguishers
29 CFR 1910.159	Automatic Sprinkler Systems
29 CFR 1910.1000	General Air Contaminants
29 CFR 1910.1001	Asbestos
29 CFR 1910.1003-16	Carcinogens (specific chemicals)
29 CFR 1910.1017	Vinyl Chloride
29 CFR 1910.1018	Arsenic (inorganic)
29 CFR 1910.1025	Lead
29 CFR 1910.1027	Cadmium
29 CFR 1910.1028	Benzene
29 CFR 1910.1030	Occupational Exposure to Bloodborne Pathogens
29 CFR 1910.1044	1,2-dibromo-3-chloropropane (DBCP)
29 CFR 1910.1045	Acrylonitrile
29 CFR 1910.1047	Ethylene Oxide
29 CFR 1910.1048	Formaldehyde
29 CFR 1910.1050	Methylenedianiline (MDA)
29 CFR 1910.1051	1,3-Butadiene
29 CFR 1910.1052	Methylene Chloride
29 CFR 1910.1096	Nonionizing Radiation Standards
29 CFR 1910.1450	Occupational Exposure to Toxic Substances in Laboratories
29 CFR 1910.1200	Hazard Communication

SHEMP Operations Manual for Laboratories

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SHEMP Operations Manual for Laboratories

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SHEM Guide 24	Chemical Hygiene
SHEM Guide 37	Occupational Noise
SHEM Guide 41	Mixed Waste
SHEM Guide 53	Workplace Inspections
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NFPA 72-1996	National Fire Alarm Code
NFPA 77-1993	Recommended Practice on Static Electricity
NFPA 91-1995	Standard for Exhaust Systems for Air Conveying of Materials
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SHEMP Operations Manual for Laboratories

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SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
A	
AA-OARM	Assistant Administrator for the Office of Administration and Resources Management
AAs	Assistant Administrators
ABET	Accreditation Board for Engineering and Technology
ABSL	Animal Biosafety Level
ACGIH	American Conference of Governmental Industrial Hygienists
ACL	Administrative Control Level
AEA	Atomic Energy Commission
AFFF	Aqueous Film-Forming Foam
AIDS	Acquired Immunodeficiency Syndrome
ALARA	As Low As Reasonably Achievable
ALI	Annual Limit on Intake
AN	Acrylonitrile
ANSI	American National Standards Institute
APC	Air Pollution Control
APCA	Air Pollution Control Association (Now AWMA)
AQCR	Air Quality Control Region
ARAR	Applicable or Relevant and Appropriate Requirement
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning
ASME	American Society of Mechanical Engineers
ASSE	American Society of Safety Engineers
ASTM	American Society for Testing and Materials
AIHA	American Industrial Hygiene Association
ATSDR	Agency for Toxic Substances and Disease Registry

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
B	
BACT	Best Available Control Technology
BBP	Bloodborne Pathogens
BAT	Best Available Technology
BCG	Bacillus Calmette-Guerin
BF ₃	BoronTrifluoride
BL	Biosafety Level
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
BSC	Biological Safety Cabinet
BSL	Biological Safety Level
BSO	Biological Safety Officer
BTL	Barner Threshold Limit
BTU	British Thermal Unit
C	
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CBA	Cost/Benefit Analysis
CBT	Computer Based Training
CDC/NIH	Centers for Disease Control/National Institutes of Health
CDRH	Center for Devices and Radiological Health
CEDE	Committed Effective Dose Equivalent
CEMP	Code of Environmental Principles
CEM	Continuous Emission Monitors
CEMs	Continuous Emissions Monitoring Systems
CERCLA	Comprehensive Environmental Response Compensation and Liability Act

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
C (cont.)	
CESQG	Conditionally-Exempt Small Quantity Generator
CFC	Chlorofluorocarbon
cfm	Cubic feet per minute
CFR	Code of Federal Regulations
CHC	Chemical Hygiene Committee
CGA	Compressed Gas Association
CG/MS	Gas Chromatography/Mass Spectroscopy
CHO	Chemical Hygiene Officer
CHP	Chemical Hygiene Plan
Ci	Curie
cm	Centimeter
cm ²	Square Centimeter
CMA	Chemical Manufacturers Association
CNC	Contamination Nuclei Counter
CNP	Controlled Negative Pressure
cpm	Counts per minute
CPG	Comprehensive Procurement Guide
CPC	Chemical Protective Clothing
CPR	Cardiopulmonary Resuscitation
CWA	Clean Water Act
D	
DAC	Derived Air Concentration
dB	Decibels
DHHS	U.S. Department of Health and Human Services
DBCP	1,2-Dibromo-3-Chloropropane

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
D (cont.)	
DHR	Design Hazard Review
DIS	Decay in Storage
DMR	Discharge Monitoring Report
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
DOP	Diocetylphthalate
DSHEMO	Designated Safety, Health, and Environmental Management Official
E	
ECAO	Environmental Criteria and Assessment Office
EDE	Effective Dose Equivalent
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ESLI	End-of-Service-Life Indicator
F	
FDA	U.S. Food and Drug Administration
FID	Flame-Ionization Detector
FMSD	Facility Management and Service Division
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
fpm	Feet per minute
FPMP	Federal Property Management Regulations
FR	Federal Register
FSOP	Facility Standard Operating Procedure
ft	Foot

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
F (cont.)	
FTA	Fault-tree analysis
G	
g	Gram
gal	Gallon
GC	Gas Chromatography
GFCI	Ground-Fault Circuit Interrupter
GM	Geiger-Mueller
GIS	Geographic Information Systems
gpm	Gallons per minute
GSA	U.S. General Services Administration
Gy	Gray
H	
HAP	Hazardous Air Pollutant
HAZOP	Hazard and Operability Study
HBV	Hepatitis B Virus
HEG	Homogeneous Exposure Group
HeNe	Helium-Neon
HEPA	High Efficiency Particulate Air
HF	Hydrofluoric Acid
HM	Hazardous Material
HMR	Hazardous Materials Regulations
HMTA	Hazardous Materials Transportation Act
HSL	Hazardous Substances List
HSWA	Hazardous and Solid Waste Amendments
HVAC	Heating, Ventilation, and Air Conditioning

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
H (cont.)	
Hz	Hertz
IAA	Isoamyl Acetate
IAEA	International Atomic Energy Agency
I	
IBC	Institutional Biosafety Committee
ICNRP	International Council on Nonionizing Radiation Protection
ICRP	International Council on Radiation Protection
IDLH	Immediately Dangerous to Life and Health
IEEE	Institute of Electrical and Electronic Engineers
in	Inch
IR	Infrared
IRPA	International Radiation Protection Association
ISO	International Standards Organization
ISWA	International Solid Waste Association
J	
JHA	Job Hazard Analysis
K	
keV	Kilo electronVolts
kg	Kilogram
kHz	KiloHertz
kW	Kilowatts
L	
LAER	Lowest Achievable Emission Rate
LAR	Laboratory Animal Research
LASER	Light Amplification by Stimulated Emission of Radiation

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
L (cont.)	
lb/m	Pounds Per Meter
LCA	Life Cycle Analysis
LDR	Land Disposal Restriction
LEAP	Laboratory Exposure Assessment Program
LDR	Land Disposal Restriction
LEL	Lower Explosion Limit
LEV	Local Exhaust Ventilation
LLRW	Low-Level Radioactive Waste
LOEL	Lowest Observed Effect Level
LQG	Large Quantity Generator
LSC	Liquid Scintillation Counter
LSF	Liquid Scintillation Fluid
LSV	Liquid Scintillation Vial
M	
m	Meter
MACT	Maximum Achievable Control Technology
MCL	Maximum Contaminant Levels
mCi	Millicurie
MDA	Methylenedianiline
mg	Milligram
MGC	Million gallons per day
min	Minutes
mL	Milliliters
MORT	Management Oversight and Risk Tree
MOU	Memorandum of Understanding

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
M (cont.)	
MPE	Maximum Permissible Exposure
mRem	Milli-rem
MSDS	Material Safety Data Sheet
mSv	Millisievert
MSW	Municipal Solid Waste
MUC	Maximum Use Concentration
mW	MilliWatt
MW	Microwave
N	
NAAQS	National Ambient Air Quality Standards
NAREL	National Air and Radiation Environmental Laboratory
NCRP	National Council on Radiation Protection and Measurement
NEC	National Electric Code
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NHP	Nonhuman Primates
NHZ	Nominal Hazard Zone
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NIR	Near Infrared
NIST	National Institute of Standards and Technology
nm	Nanometer
NMR	Nuclear Magnetic Resonance
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
N (cont.)	
NSF	National Sanitation Foundation
NSPS	New Source Performance Standard
NSR	New Source Review
OA	Office of Administration
O	
OEP	Occupant Emergency Plan
OPIM	Other Potentially Infectious Material
OARM	Office of Administration and Resources Management
ORIA	Office of Radiation and Indoor Air
OSC	On-Scene Coordinator
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
P	
PBS	Public Buildings Service
PCBs	Polychlorinated Biphenyls
PEL	Permissible Exposure Limits
PI	Principal Investigator
PF	Protection Factor
PID	Photoionization Detector
PM	Preventive Maintenance
POHCs	Principal Organic Hazardous Constituents
POTW	Publicly-Owned Treatment Works
PP	Priority Pollutants
ppb	Part per billion
PPE	Personal Protective Equipment

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
P (cont.)	
ppm	Part per million
PSD	Prevention of Significant Deterioration
psi	Pounds per square inch
psia	Pounds per square inch (absolute)
psig	Pounds per square inch (gage)
Q	
QA/QC	Quality Assurance/Quality Control
QLFT	Qualitative Fit-Testing
QNFT	Quantitative Fit-Testing
R	
RAs	Regional Administrators
RCRA	Resource Conservation and Recovery Act
rDNA	recombinant DNA
REAC/TS	Radiation Emergency Assistance Center/Training Site
REL	Recommended Exposure Limits
RF	Radio Frequency
RFI	RCRA Facility Investigation
RHIB	Rigit-Hill, Inherent-Buoyancy
RPC	Radiation Protection Committee
RPF	Respirator Protection Factor
RSO	Radiation Safety Officer
RSC	Radiation Safety Committee
RSP	Radiation Safety Program
S	
SARA	Superfund Amendments and Reauthorization Act

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
S (cont.)	
SCBA	Self Contained Breathing Apparatus
SDWA	Safe Drinking Water Act
SHE	Safety, Health, and Environmental
SHEM	Safety, Health and Environmental Management
SHEMD	Safety, Health and Environmental Management Division
SHEMG	Safety, Health and Environmental Management Guidelines
SHEMP	Safety, Health, and Environmental Management Program
SIC	Standard Industry Code
SOP	Standard Operating Procedure
SQG	Small Quantity Generator
SPCC	Spill Prevention, Control, and Countermeasures
SRC	Simple Root Cause
STS	Standard Threshold Shift
STEL	Short-Term Exposure Limit
Sv	Sievert
SWMU	Solid Waste Management Unit
SWP ³	Stormwater Pollution Prevention Program
T	
TCLP	Toxicity Characteristics Leaching Procedure
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter
TRI	Toxic Release Inventory
TLV	Threshold Limit Value
TQM	Total Quality Management
TSCA	Toxic Substance Control Act

SHEMP Operations Manual for Laboratories

Acronyms

Acronyms	
T (cont.)	
TSD	Treatment, Storage, and Disposal
TSDF	Treatment, Storage, and Disposal Facility
TSS	Total Suspended Solids
TWA	Time-Weighted-Average
U.S.	United States
U	
U.S.	United States
USGS	United States Geological Survey
UST	Underground Storage Tank
UV	Ultra-violet
V	
VIS	Visible
W	
WL	Working Level
WLM	Working Level Month
WMA	Waste Management Association
WMSD	Work-related musculoskeletal disorders
WPCF	Water Pollution Control Federation (Now WEF)
Y	
YAG	Yttrium Aluminum Garnet
μCi	Microcurie

SHEMP Operations Manual for Laboratories

Glossary

A	
Absorbent	A substance that takes in or absorbs other material.
Accident/Incident Investigation	A systematic method for determining the direct and contributing causes of an accident or incident.
Acclimatization	The process of becoming adjusted to new climatic conditions (i.e., heat, cold).
Accumulation area	Area where hazardous wastes are accumulated for a period of less than either 90 days (large quantity generators) or 180 days (small quantity generators).
Acoustic, Acoustical	Containing, producing, arising from, actuated by, related to, or associated with sound.
Action Level	Term used by the U.S. Occupational, Safety and Health Administration and the National Institutes of Occupational Safety and Health to express the level of toxicant that requires medical surveillance, usually one half the permissible exposure limit.
Acute Toxicity	The acute adverse effects resulting from a single dose of, or exposure to, a substance.
Acute Exposure	A dose that is delivered to the body in a single event or in a short period of time.
Acute Effect	An adverse effect on a humans or animals, with several symptoms developing rapidly and coming quickly to a crisis.
Administrative Controls	Methods of controlling employee exposures by job rotation, varying tasks, work assignment, operational procedures, or time periods away from the hazard(s).
Adsorption	The condensation of gases, liquids, or dissolved substances on the surfaces of solids.
Adverse Weather	The weather conditions that make it difficult for response equipment and personnel to cleanup or remove spilled oil, and that will be considered when identifying response systems and equipment in a response plan for the applicable operating environment.
Aerosol	A gaseous suspension of fine solid or liquid particles.
Air Monitoring	Process by which airborne concentrations of contaminants are sampled and quantified.
Air-Purifying Respirator	Respirators that use filters or sorbents to remove harmful substances from the air.
Air-Supplied Respirator	Respirator that provides a supply of breathable air from a clean source outside of the contaminated work area.
Airborne Radioactivity Area	Any area within a radiological area where the gross alpha or gross beta airborne concentrations significantly exceed the background concentration.
Alpha Particle	A small positively charged particle made up of two neutrons and two protons.
Ambient Noise	The all-encompassing noise associated with a given environment, usually a composite of sounds from many sources.

SHEMP Operations Manual for Laboratories

Glossary

A (continued)	
Anemometer	A device to measure air velocity.
Annual Limit On Intake (ALI)	The quantity of a single radionuclide which, if inhaled or ingested in one year, would irradiate a person represented by reference man to the limiting value for control of the workplace.
Annual Capacity Factor	The ratio between the actual heat input to a steam generating unit from the fuels listed in 40 CFR 60.42b(a), 60.43b(a), or 60.44b(a), as applicable, during a calendar year and the potential heat input to the steam generating unit had it been operated for 8,760 hours during a calendar year at the maximum steady state design heat input capacity. In the case of steam generating units that are rented or leased, the actual heat input shall be determined based on the combined heat input from all operations of the affected facility during a period of 12 consecutive calendar months.
Anthropometry	The science of measuring the human body for differences in various characteristics.
Article	A manufactured item (1) which is formed to a specific shape or design during manufacture, (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use, and (3) which has either no change of chemical composition during its end use or only those changes of composition which have not commercial purpose separate from that of the article, and that result from a chemical reaction that occurs upon end use of other chemical substances, mixtures, or articles; except that fluids and particles are not considered articles regardless of shape or design.
As Low As Reasonably Achievable (ALARA)	An approach to radiation protection to control or manage exposures (both individual and collective to the work force and general public) as low as social, technical, economic, practical, and public policy considerations permit. ALARA is not a dose limit but a process which has the objective of achieving dose levels as far below applicable limits as reasonably achievable.
Asbestos	The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite.
Asphyxiant	A vapor or gas that can cause unconsciousness or death by suffocation (lack of oxygen).
Atomic Absorption Spectrophotometer	An analytical instrument used to identify an unknown substance (typically metals) by measuring its absorption spectra when it is decomposed in a flame.
Audiogram	A record of hearing loss of hearing level measured at several different frequencies—usually 500 to 6,000 Hz. The audiogram may be presented graphically or numerically.
Audiometer	An instrument that measures a person's ability to hear a pure tone at various frequencies.
Audit	A methodical examination and review.

SHEMP Operations Manual for Laboratories

Glossary

B	
Background Noise	Noise coming from sources other than the particular noise source being monitored.
Background Radiation	The radiation in man's natural environment, including cosmic rays and radiation from the naturally radioactive elements, both outside and inside the bodies of humans and animals. It is also called natural radiation.
Baffle	Adjustable panels at the back of a laboratory fume hood used to ensure uniform air distribution across the face of the hood.
Base	A compound that reacts with an acid to form a salt. It is another term for alkali.
Becquerel (Bq)	The SI unit of activity: 1 Becquerel = 1 disintegration per second = 27 picocuries.
Biodegradable	Capable of being broken down into innocuous products by the action of living things.
Biohazard Area	Any area (a complete operating complex, a single facility, a room within a facility, etc.) in which work has been, or is being, performed with biohazardous agents or materials.
Biohazard Control	Any set of equipment and procedures utilized to prevent or minimize the exposure of humans and their environment to biohazardous agents or materials.
Biohazard	A biological hazard. Organisms or products of organisms that present a risk to humans.
Biological Safety Cabinet	A specific type of hood used to control exposures to highly hazardous materials (e.g., viruses, extremely toxic chemicals, etc.).
Boiler Codes	Standards prescribing requirements for the design, construction, testing, and installation of boilers and unfired pressure vessels.
Breathing Zone	Imaginary globe of two-foot radius surrounding the head.
Byproduct Material	Any radioactive material, except special nuclear material, made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and the tailings and wastes produced by the extraction or concentration of uranium and thorium from ore.
Byproduct	A chemical substance produced without a separate commercial intent during the manufacture, processing, use, or disposal of another chemical substance(s) or mixture(s).
C	
Capture Velocity	Air velocity at any point in front of the exhaust hood necessary to overcome opposing air currents and to capture the contaminated air by causing it to flow into the exhaust hood.
Carcinogen	A substance or agent that can cause a growth of abnormal tissue or tumors in humans or animals.
Carcinogenic	Cancer-producing.

SHEMP Operations Manual for Laboratories

Glossary

C (continued)	
Cardiovascular	Relating to the heart and the blood vessels or the circulation.
Carpal Tunnel Syndrome	An affliction caused by compression of the median nerve in the carpal tunnel.
Carpal Tunnel	A passage in the wrist that the median nerve and many tendons pass to the hand from the forearm.
CAS Number	Identifies a particular chemical by the Chemical Abstract Service, a service of the American Chemical Society that indexed and compiles abstracts of worldwide chemical literature called "Chemical Abstracts."
Category I Nonfriable Asbestos-Containing Material (ACM)	Asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in Appendix E, Subpart E, 40 CFR Part 763, Section 1, Polarized Light Microscopy.
Category II Nonfriable Asbestos-Containing Material (ACM)	Any material, excluding Category I nonfriable asbestos-containing material, containing more than one percent asbestos as determined using the methods specified in appendix E, Subpart E, 40 CFR Part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
Ceiling Limit ©	In ACGIH terminology, an airborne concentration of a toxic substance in the work environment that should never be exceeded.
Centrifuge	An apparatus that uses centrifugal force to separate or remove particulate matter suspended in a liquid.
Chemical Cartridge	A chemical cartridge is used with a respirator for removal of low concentrations of specific vapors and gases.
CHEMTREC	Chemical Transportation Emergency Center.
Chronic Exposure	Low doses repeatedly received by the body over a long period of time.
Circuit Breaker	A device that automatically interrupts the flow of an electrical current when the current becomes excessive.
Coal	All solid fuels classified as anthracite, bituminous, sub-bituminous, or lignite by the American Society of Testing and Materials in ASTM D388-77, Standard Specification for Classification of Coals by Rank, coal refuse, and petroleum coke. Coal-derived synthetic fuels, including but not limited to solvent refined coal, gasified coal, coal-oil mixtures, and coal-water mixtures, are also included in this definition for the purposes of NSPS, Subparts Db and Dc.
Combustible Liquids	Liquids having a flashpoint at or above 100°F (378°C).
Combustible	Able to catch fire and burn.
Committed Effective Dose Equivalent (CEDE)	The effective dose equivalents that will be accumulated over 50 years following the intake. Does not include contributions from external dose.

SHEMP Operations Manual for Laboratories

Glossary

C (continued)	
Cardiovascular	Relating to the heart and the blood vessels or the circulation.
Communicable	Refers to a disease whose causative agent is readily transferred from one person to another.
Complex	A facility possessing a combination of transportation-related and non-transportation-related components that is subject to the jurisdiction of more than one Federal agency under section 311(j) of the Clean Water Act.
Compressed Gas Cylinder	A cylinder containing vapor or gas under higher than atmospheric pressure.
Conditionally Exempt Small Quantity Generator (CESQG)	A generator who generates less than or equal to 100 kilogram, or less than or equal to one kilogram of acute hazardous waste, in a calendar month.
Conductive Hearing Loss	Type of hearing loss; not caused by noise exposure, but due to any disorder in the middle or external ear that prevents sound from reaching the inner ear.
Confined Space	Any area that has limited openings for entry and exit that would make escape difficult in an emergency, has a lack of ventilation, contains known and potential hazards, and is not intended nor designated for continuous human occupancy.
Contact Dermatitis	Dermatitis caused by contact with a substance—gaseous, liquid, or solid. May be due to primary irritation or an allergy.
Containment Area	A hazardous waste management unit that is used to store or treat hazardous waste.
Contamination Area	Any area in which the removable surface contamination exceeds 20 dpm/100 cm ² or 200 dpm/100 cm ² gross alpha or gross beta activity, respectively, or total surface contamination (removable and fixed) that exceeds 500 disintegrations per second/100 cm ² or 1,000 dpm/100 cm ² gross alpha or gross beta activities, respectively.
Contingency Plan	Document that establishes an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.
Continual Improvement	Process of enhancing the environmental, safety, and health management systems to achieve improvements in the overall safety, health, and environmental performance year-to-year.
Controlled Area	Any area to which access is secured and posted in order to protect individuals from exposure to radiation or radioactive materials.
Corrosivity	Characteristic of having a pH less than or equal to 2 (acidic) or greater than or equal to 12.5 (basic/caustic).
Cost Benefit Analysis	A method by which the cost of an improvement is contrasted with the expected benefit from the improvement.
Cryogenics	The field of science dealing with the behavior of matter at very low temperatures.

SHEMP Operations Manual for Laboratories

Glossary

C (continued)	
Cumulative Trauma Disorder	A disorder caused by one or more of the following: repetitive motion of a body part, excessive force, or awkward body posture.
Customer	Any person to whom a manufacturer, or importer, or processor directly distributes any quantity of a chemical substance, mixture, mixture containing the substance or mixture, or article containing the substance or mixture, whether or not a sale is involved.
CWA and Regulations	The Clean Water Act (CWA) and applicable regulations promulgated thereunder. In the case of an approved State program, it includes State program requirements.
D	
Damper	A valve or plate typically placed in the ductwork for regulating the flow of air.
dBA	Sound level in decibels read on the A-scale of a sound level meter. The "A" scale discriminates against very low frequencies (as does the human ear) and is therefore better for measuring general sound levels.
Decibel (dB)	A unit used to express sound power level (L_w). Sound power is the total acoustic output of a sound source in watts (W). By definition, sound power level, in decibels, is: $L_w = 10 \log W/W_0$ where W is the sound power of the source and W_0 is the reference sound power.
Decontaminate	To make safe by eliminating poisonous or otherwise harmful substances, such as noxious chemicals or radioactive material.
Default Value	A value used in a computation when the actual (true) value is unknown (unmeasured).
Demolition	The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.
Derived Air Concentration (DAC)	The average concentration of a radionuclide in air that, if inhaled for a 2000-hour working year, would result in an intake of one ALI. The DAC is determined by dividing the ALI for any given radionuclide by the volume of air breathed by an average worker during a working year (2,400 m ³). In most cases, an exposure of 1 DAC-hour may be assumed to be equivalent to a committed effective dose equivalent of 2.5 millirem.
Dermatitis	Inflammation of the skin from any cause.
Dike	A barrier constructed to control or confine substances and prevent their movement.
Direct Discharge	The "discharge of a pollutant."
Direct-Reading Instrumentation	Those instruments that give an immediate indication of the concentration of aerosols, gases, or vapors or magnitude of physical hazard by some means such as a dial or meter.
Discharge	Includes but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying or dumping. The term "discharge" shall not include any discharge of oil which is authorized by a permit issued pursuant to section 13 of the River and Harbor Act of 1899 (30 Stat. 1121, 33 U.S.C. 407), or sections 402 or 405 of the FWPCA Amendments of 1972 (86 Stat. 816 et seq., 33 U.S.C. 1251 et seq.). Used without qualification means the "discharge of a pollutant."

SHEMP Operations Manual for Laboratories

Glossary

D (continued)	
Discharge Monitoring Report (DMR)	The EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by “approved States” as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA’s.
Discharge of a Pollutant	(a) Any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or (b) Any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.
Disposal Facility	A facility at which hazardous waste is intentionally placed into or on any land or water and at which such waste will remain after closure.
Disposal	The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid or hazardous waste into or on any land or water so that such waste, or any constituent of such waste, may enter the environment or be emitted into the air or discharged into any waters (including groundwaters).
Domestic	Within the geographical boundaries of the 50 United States, including the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Northern Mariana Islands, and any other territory or possession of the United States.
Dose	A term used (1) to express the amount of a chemical or of ionizing radiation energy absorbed in a unit volume or an organ or individual. Dose rate is the dose delivered per unit of time; (2) Used to express amount of exposure to a chemical substance.
Dose Equivalent (H)	The product of absorbed dose in tissue (D) (in rads or grays), a quality factor (Q), and any other modifying factors (N), where $H = DQN$. The dose equivalent is expressed in units of rem or sieverts.
Draft Permit	A document prepared under 40 CFR 124.6 indicating the Director’s tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a “permit.” A notice of intent to terminate a permit, and a notice of intent to deny a permit, as discussed in 40 CFR 124.5, are types of “draft permits.” A denial of a request for modification, revocation and reissuance, or termination, as discussed in 40 CFR 124.5, is not a “draft permit.” A “proposed permit” is not a “draft permit.”
Dry Chemical	A powdered fire extinguishing agent usually composed of sodium bicarbonate, monoammonium phosphate, potassium bicarbonate, etc.
Dusts	Solid particles generated by handling, crushing, grinding, rapid impact, detonation, and decrepitation of organic or inorganic materials, such as rock, ore, metal, coal, wood, and grain. Dusts do not tend to flocculate, except under electrostatic forces; they do not diffuse in air but settle under the influence of gravity.

SHEMP Operations Manual for Laboratories

Glossary

E	
Effective Dose Equivalent (H_E)	The sum over specified tissues of the products of the dose equivalent in a tissue (H_T) and the weighting factor (W_T) for that tissue, i.e., $H_E = \sum W_T H_T$ (expressed in units of rem or sieverts).
Effluent Limitation	Any restriction imposed by the Director on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States," the waters of the "contiguous zone," or the ocean.
Egress	A means of exit.
Elephant Trunk	A flexible section of duct with a flanged or unflanged opening.
Emergency Shower	A water shower for an employee when the employee has had chemical exposure that needs to be washed off quickly.
Emergency Stop (Switch)	A switch or other device that when activated quickly stops the controlled mechanisms.
Emergency Plan	A plan of action for a disaster.
Emission	The release of some undesirable byproduct or product from an operation.
Energy-Isolating Device	A mechanical device that prevents the release or transmission of energy. Some examples of energy-isolating devices include: a manually operated circuit breaker, a disconnect switch, a line valve, a block, and other similar devices. The following are <i>not</i> energy-isolating devices: push buttons, selector switches, and other circuit control devices.
Engineering Controls	Methods of controlling employee exposures by modifying the source or reducing the quantity of hazards.
Environmental Impacts	Any change to the environment, whether adverse or beneficial, resulting from an organization's activities, products or services (e.g., contamination of water or the depletion of natural resources).
Environmental Aspects	Parts of an organization's activities, products or services that can interact with the environment. Aspects include discharges, emissions and consumption of resources.
Environmental Toxicity	Information obtained as a result of conducting environmental testing designed to study the effects on aquatic and plant life.
EPA Worker	Any full-time, part-time, temporary, and permanent EPA employee; any federal, state or local government employee assigned or detailed to the EPA; any enrollee in the EPA's Senior Environmental Employment (SEE) Program; any student assigned to the EPA; any EPA stay-in-school program participant; any intern or fellow assigned to the EPA; and others who are designated on a case-by-case basis by the SHEMD Director.
Emission Standards	The maximum amount of pollutant permitted to be discharged from a single polluting source.

SHEMP Operations Manual for Laboratories

Glossary

E (continued)	
Epidemiology	The branch of biostatistics and medicine concerned with the study of diseases.
Ergonomics	The study of human characteristics for the appropriate design of living and work environments.
Exhaust Ventilation	The removal of air (usually by mechanical means) from any space. The flow of air between two points is due to the occurrence of a pressure difference between the two points. This pressure difference will cause air to flow from the high pressure to the low pressure zone.
Explosive Limit	See Lower Explosive Limit and Upper Explosive Limit.
Exposure	Contact with a chemical, biological, or physical hazard.
External Exposure	The dose of radiation received by an individual from a source of ionizing radiation outside the body.
Extinguishing Media	The firefighting substance to be used to control a material in the event of a fire. It is usually referred to by its generic name, such as foam, water, etc.
F	
Face Velocity	Average air velocity into the exhaust system measured at the opening into the hood or booth.
Facility or Activity	Any NPDES "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.
Fault Tree Analysis	A methodology to identify combinations of equipment failures and human errors that result in an accident or event.
Federal Facility	Any facility owned or operated by any department, commission, agency, office, bureau or other unit of the government of the United States of America except for facilities owned or operated by the Department of Energy.
Filter	(1) A device for separating components of a signal on the basis of its frequency. It allows components in one or more frequency bands to pass relatively unattenuated, and it attenuates greatly components in other frequency bands. (2) A fibrous medium used in respirators to remove solid or liquid particles from the airstream entering the respirator. (3) A sheet of material that is interposed between patient and the source of x-rays to absorb a selective part of the x-rays. (4) A fibrous or membranous medium used to collect dust, fume, or mist air samples.
Filter, HEPA	High-efficiency particulate air filter that is at least 99.97 percent efficient in removing thermally generated monodisperse dioctylphthalate smoke particles with a diameter of 0.3 micrometers.
Fire Brigade	An organized group trained in firefighting operations.

SHEMP Operations Manual for Laboratories

Glossary

F (continued)	
Fire Doors	Doors rated and tested for resistance to various degrees of fire exposure and used to prevent the spread of fire through horizontal and vertical openings.
Fire Resistant	See Flameproof.
First Aid	The immediate care given to the injured or suddenly ill person.
Flameproof	Material incapable of burning. The term “fireproof” is false. No material is immune to the effects of fire possessing sufficient intensity and duration. The term is commonly, although erroneously, used synonymously with “fire resistive.”
Flammable	Any substance that is easily ignited, burns intensely, or has a rapid rate of flame spread. Flammable and inflammable are identical in meaning; however, the prefix “in” indicates negative in many words and can cause confusion. Flammable, therefore, is the preferred term.
Flammable Liquid	Any liquid having a flash point below 100°F (37.8°C).
Flammable Range	The difference between the lower and upper flammable limits, expressed in terms of percentage of vapor or gas in air by volume, and is also often referred to as the “explosive range.” See Lower Explosive Limit and Upper Explosive Limit.
Flash Point	The lowest temperature at which a liquid gives off enough vapor to form an ignitable mixture with air and produce a flame when a source of ignition is present.
Frequency (in hertz or Hz)	Rate at which oscillations are produced. One hertz is equivalent to one cycle per second.
Friable Asbestos Material	Any material containing more than 1 percent asbestos as determined using the method specified in appendix E, Subpart E, 40 CFR part 763 section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent as determined by a method other than point counting by polarized light microscopy (PLM), verify the asbestos content by point counting using PLM.
Fume Hood	A shaped inlet designed to capture contaminated air and direct it into an exhaust system.
Fume	Airborne particulate formed by the evaporation of solid materials (e.g., metal fume emitted during welding). Usually less than one micron in diameter.
G	
Gas	A state of matter in which the material has very low density and viscosity; can expand and contract greatly in response to changes in temperature and pressure; easily diffuses; and is neither a solid nor a liquid.
General Exhaust	A system for exhausting air containing contaminants from a general work area, usually accomplished via dilution.

SHEMP Operations Manual for Laboratories

Glossary

G (Continued)	
General Dilution Ventilation	A ventilation system designed to supply air to an occupied space (e.g., office, laboratory, etc.).
General Permit	An NPDES “permit” issued under 40 CFR 122.28 authorizing a category of discharges under the CWA within a geographical area.
General Ventilation	System of ventilation consisting of either natural or mechanically induced fresh air movements to mix with the dilute contaminants in the workroom air.
Generator	Any person/facility whose act or process produces hazardous waste or whose act first causes a hazardous waste to become subject to regulation.
Glove Box	A sealed enclosure in which all handling of items inside the box is carried out through long impervious gloves sealed to ports in the walls of the enclosure.
Grab Sample	A sample that is taken within a very short time period during which atmospheric concentration is assumed to be constant throughout the sample.
Gray (Gy)	The unit of absorbed dose: 1 Gy = 100 rads.
Ground	A contact with the ground that becomes part of the circuit.
Ground Fault Circuit Interrupter (GFCI)	A device that measures the amount of current flowing to and from an electrical source. When a difference is sensed, indicating a leakage of current that could cause an injury, the device very quickly breaks the circuit.
Grounding	The procedure used to carry an electrical charge to ground through a conductive path.
Guard	An enclosure that prevents entry into the point of operation of a machine or renders contact harmless with any substance or object.
H	
Halogenated Hydrocarbon	A chemical material that has carbon plus one or more of these elements: chlorine, fluorine, bromine, or iodine.
Hand Protection	Specific type of gloves or other hand protection required to prevent harmful exposure to hazardous materials.
Hazard	An unsafe condition that, if left uncontrolled, may contribute to an accident.
Hazardous Agent	A biological or chemical substance that has the potential for causing harm to people, property, or the environment.
Hazard Analysis	An analysis performed to identify hazardous conditions and gather hazard and failure data for the purpose of their elimination or control.
Hazard Control	Development of a program to recognize, evaluate, and eliminate the destructive efforts of hazards arising from human error and conditions in the workplace.

SHEMP Operations Manual for Laboratories

Glossary

H (continued)	
Hazardous Material	Any substance or compound that has the capability of producing adverse effects on the health and safety of humans.
Hazardous Waste	Materials that are solid, semi-solid, or liquid that meet the following criteria: <ul style="list-style-type: none"> - Discarded, abandoned, accumulated, stored, or treated for recycling - Ignitable, reactive, corrosive, or meet the TCLP - Listed by the EPA
HAZOP	Hazard and Operability Study used to identify process hazards and operability problems in design and procedures.
Hearing Conservation	The prevention or minimization of noise-induced deafness through the use of hearing protection devices; the control of noise through engineering methods, annual audiometric tests, and employee training.
Heat Input	Heat derived from combustion of fuel in a steam generating unit and does not include the heat input from preheated combustion air, recirculated flue gases, or exhaust gases from other sources, such as gas turbines, internal combustion engines, kilns, etc.
HEPA Filter	See Filter, HEPA.
High Radiation Area	An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.1 rem (1 millisievert) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.
Hood	(1) Enclosure, part of a local exhaust system; (2) a device that completely covers the head, neck, and portions of the shoulders.
Human-Equipment Interface	Areas of physical or perceptual contact between man and equipment. The design characteristics of the human-equipment interface determine the quality of information. Poorly designed interfaces may lead to excessive fatigue or localized trauma (e.g., calluses).
I	
Immediately Dangerous to Life or Health (IDLH)	Used to describe very hazardous atmospheres where employee exposure can cause serious injury or death within a short time or serious delayed effects.
Imminent Danger	Any condition or practice in any EPA workplace or at any EPA field site that could reasonably be expected to cause death or serious physical harm either immediately or before the danger could be eliminated through normal administrative procedures.
Impervious	A material that does not allow another substance to pass through or penetrate it.
Import in Bulk Form	To import a chemical substance (other than as part of a mixture or article) in any quantity, in cans, bottles, drums, barrels, packages, tanks, bags, or other containers, if the chemical substance is intended to be removed from the container and the substance has an end use or commercial purpose separate from the container.

SHEMP Operations Manual for Laboratories

Glossary

I (continued)	
Import for Commercial Purposes	To import with the purpose of obtaining an immediate or eventual commercial advantage for the importer, and includes the importation of any amount of a chemical substance or mixture. If a chemical substance or mixture containing impurities is imported for commercial purposes, then those impurities also are imported for commercial purposes.
Importer	Any person who imports any chemical substance or any chemical substance as part of a mixture or article into the customs territory of the United States.
Inches of Mercury Column	A unit used in measuring pressures. One inch of mercury column equals a pressure of 1.66 kilopascal (0.491 pounds per square inch).
Incident	An undesired event that may cause personal harm or other damage. In the United States, OSHA defines the criteria for recordkeeping purposes.
Incineration	The controlled process by which combustible solid, liquid, or gaseous wastes are burned and changed into noncombustible gases.
Industrial Waste	Waste generated by industrial processes and manufacturing activities.
Industrial Hygiene	The science (or art) devoted to the recognition, evaluation, and control of those environmental factors or stresses (i.e., chemical, physical, biological, and ergonomic) that may cause sickness, impaired health, or significant discomfort to employees or residents of the community.
Inert Gas	A gas that does not normally combine chemically.
Infrared Radiation	Electromagnetic energy with wavelengths from 770 nanometers to 12,000 nanometers.
Ingestion	(1) The process of taking substances into the stomach, as food, drink, medicine, etc., (2) With regard to certain cells, the act of engulfing or taking up bacteria and other foreign matter.
Inhalation	The breathing in of a substance in the form of a gas, vapor, fume, mist, or dust.
Injury	A measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource resulting either directly or indirectly from exposure to a discharge of oil, or exposure to a product of reactions resulting from a discharge of oil.
Insoluble	Incapable of being dissolved.
Inspection	Monitoring function conducted in an organization to locate and report existing and potential hazards having the capacity to cause accidents in the workplace.
Installation	Any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under common control).

SHEMP Operations Manual for Laboratories

Glossary

I (continued)	
Interlock	A device that interacts with another device or mechanism to govern succeeding operations. For example, an interlocked machine guard will prevent the machine from operating unless the guard is in its proper place.
Internal Exposure	The dose of radiation received by the internal organs of the body from radionuclides ingested, inhaled, or absorbed into the body.
International Standards Organization (ISO)	The specialized international agency for standards' with membership of over 90 countries.
Ionizing Radiation	Any electromagnetic or particulate radiation capable of displacing electrons from atoms or molecules, directly or indirectly on its passage through matter, thereby producing ions. Alpha and beta particles, gamma rays, x-rays, and neutrons are examples of ionizing radiation.
Irradiation	The exposure of something to radiation.
Irritant	A substance that produces an irritating effect when it contacts skin, eyes, or respiratory system.
J	
Job Safety Analysis	A method for studying a job in order to 1) identify hazards or potential accidents associated with each step or task and 2) develop solutions that will eliminate, nullify, or prevent such hazards or accidents. Sometimes called Job Hazard Analysis.
Job Hazard Analysis	A systematic method for identifying the hazards of a particular task or job.
L	
Land Disposal	Includes, but is not limited to, any placement of hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or placement in a concrete vault or bunker intended for disposal purposes.
Landfill	An area of land or an excavation in which wastes are placed for permanent disposal and which is not a land application unit, surface impoundment, injection well, or waste pile.
Large Quantity Generator (LQG)	A generator who generates greater than or equal to 1,000 kilograms of hazardous waste, or greater than 1 kilograms of acute hazardous waste, in a calendar month.
Laser	The acronym for Light Amplification by Stimulated Emission of Radiation.
Local Exhaust	A system for capturing and exhausting contaminants from the air at the point where the contaminants are produced.
Local Exhaust Ventilation	A ventilation system that captures and removes contaminants at the point they are being produced before they escape into the workroom air.
Lockout/Tagout	A program or procedure that prevents injury by eliminating unintentional operation or release of stored energy within machinery or processes during set-up, start-up, or maintenance repairs.

SHEMP Operations Manual for Laboratories

Glossary

L (continued)	
Loss Prevention	A before-the-loss program designed to identify and correct potential accidental problems before they result in fatality, injury, property damage and/or business interruption.
Lower Explosive Limit (LEL)	The lower limit of flammability of a gas or vapor at ordinary ambient temperatures expressed in percent of the gas or vapor in air by volume. (See Upper Explosive Limit and Flammable Range.)
Lumen	The flux on one square foot of a sphere, one foot in radius, with a light source of one candle at the center that radiates uniformly in all directions.
M	
Machine Guarding	A process which prevents parts of the body from contacting moving machinery at its point of operation.
Makeup Air	Clean, tempered outdoor air supplied to a work space to replace air removed by exhaust ventilation or some industrial process.
Management System	The organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the safety, health and environmental policies.
Manifest	The EPA shipping document Form 8700-22 and, if necessary, 8700-22A, which must be originated and signed by a hazardous waste generator prior to hazardous waste shipment.
Manometer	Instrument for measuring pressure; essentially a U-tube partially filled with a liquid (usually water, mercury, or a light oil), so constructed that the amount of displacement of the liquid indicates the pressure being exerted on the instrument.
Maser	Acronym for Microwave Amplification by Stimulated Emission of Radiation.
Maximum Permissible Concentration (MPC)	These concentrations are set by the National Committee on Radiation Protection (NCRP). They are recommended maximum average concentrations of radionuclides to which a worker may be exposed, assuming that he works 8 hours a day, 5 days a week, and 50 weeks a year.
Maximum Heat Input Capacity	The ability of a steam generating unit to combust a stated maximum amount of fuel on a steady state basis, as determined by the physical design and characteristics of the steam generating unit.
Maximum Permissible Dose (MPD)	A permissible dose is defined as the dose of ionizing radiation that, in the light of present knowledge, is not expected to cause appreciable bodily injury to a person at any time during their lifetime.
Maximum Extent Practicable	The limitations used to determine oil spill planning resources and response times for on-water recovery, shoreline protection, and cleanup for worst case discharges from onshore non-transportation-related facilities in adverse weather.
Maximum Design Heat Input Capacity	The ability of a steam generating unit to combust a stated maximum amount of fuel (or combination of fuels) on a steady state basis as determined by the physical design and characteristics of the steam generating unit.

SHEMP Operations Manual for Laboratories

Glossary

M (continued)	
Maximum Use Concentration (MUC)	The product of the protection factor of the respiratory protection equipment and the permissible exposure limit.
Mechanical Filter Respirator	A respirator used to protect against airborne particulate matter like dusts, mists, metal fume, and smoke. Mechanical filter respirators do not provide protection against gases, vapors, or oxygen-deficient atmospheres.
Mechanical Ventilation	A powered device, such as a motor-driven fan or vacuum hose attachment, for exhausting contaminants from a workplace, vessel, or enclosure.
Millimeters (mm) water gauge	Unit of measurement (either positive or negative) used to express air pressure.
Mist	Suspended liquid droplets generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state, such as by splashing, foaming, or atomizing.
Mixture and Derived from Rules	Regulations that require non-hazardous waste combined with hazardous waste, and solid waste resulting from the combination of hazardous waste and other materials, to be managed as a hazardous waste.
Monitoring	Testing to determine if the parameters being measured are within acceptable limits. This includes environmental and medical (biological) monitoring in the workplace.
MSDS	Material Safety Data Sheet. A document prepared by a chemical manufacturer, describing the properties and hazards of the chemical.
Municipal Solid Waste	Residential and commercial solid waste generated within a community.
Mutagenic	A substance having properties which cause changes within the chromosomes or genes.
N	
National Pollutant Discharge Elimination System (NPDES)	The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA.
Natural Gas	(1) a naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in geologic formations beneath the earth's surface, of which the principal constituent is methane; or (2) liquid petroleum gas, as defined by the American Society for Testing and Materials in ASTM D1835-82, Standard Specification for Liquid Petroleum Gases.
Navigable Waters of the United States	"Navigable waters" as defined in section 502(7) of the FWPCA, includes: (1) All navigable waters of the United States, as defined in judicial decisions prior to passage of the 1972 Amendments to the FWPCA (Pub. L. 92-500), and tributaries of such waters (2) Interstate waters (3) Intrastate lakes, rivers, and streams which are utilized by interstate travelers for recreational or other purposes (4) Intrastate lakes, rivers, and streams from which fish or shellfish are taken and sold in interstate commerce

SHEMP Operations Manual for Laboratories

Glossary

N (continued)	
New Chemical Substance	Any chemical substance which is not included in the chemical substance list compiled and published under TSCA Section 8 (i.e., the TSCA Inventory).
Noise-Induced Hearing Loss	The slowly progressive inner ear hearing loss that results from exposure to continuous noise over a long period of time as contrasted to acoustic trauma or physical injury to the ear.
Nonflammable	Not easily ignited, or if ignited, not burning with a flame (smolders).
Nonfriable Asbestos-Containing Material	Any material containing more than 1 percent asbestos as determined using the method specified in Appendix E, Subpart E, 40 CFR 763, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
Nonionizing Radiation	Electromagnetic radiation that does not cause ionization. Includes ultraviolet, laser, infrared, microwave, and radiofrequency radiation.
Nonradiological Area	Any area within the laboratory which is kept free of surface contamination and/or radiation fields that exceed background levels.
Nonsparking Tools	Tools made from beryllium-copper or aluminum-bronze that produce no sparks, or low energy sparks, when used to strike other objects.
Noise Reduction Rating (NRR)	As applied to ear protection, the number of decibels that the device reduces in transmission to the ear.
Nuisance Dust	Has a long history of little adverse effect on the lungs and does not produce significant organic disease or toxic effect when exposures are kept under reasonable control.
O	
Occupationally Exposed Workers	Individuals who have a significant potential for exposure to radiation.
Offshore Facility	Any facility of any kind located in, on, or under any of the navigable waters of the United States, which is not a transportation-related facility.
Oil	Crude oil or petroleum or a liquid fuel derived from crude oil or petroleum, including distillate and residual oil.
Oil Spill Removal Organization	An entity that provides oil spill response resources, and includes any for-profit or not-for-profit contractor, cooperative, or in-house response resources that have been established in a geographic area to provide required response resources.
Onshore Facility	Any facility of any kind located in, on, or under any land within the United States, other than submerged lands, which is not a transportation-related facility.
Own or Control	Ownership of 50 percent or more of a company's voting stock or other equity rights, or the power to control the management and policies of that company.
Owner or Operator	Any person owning or operating an onshore facility or an offshore facility, and in the case of any abandoned offshore facility, the person who owned or operated such facility immediately prior to such abandonment.

SHEMP Operations Manual for Laboratories

Glossary

O (continued)	
Owner or Operator of a Demolition or Renovation Activity	Any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.
Oxidation	Process of combining oxygen with some other substance; technically, a chemical change in which an atom loses one or more electrons whether or not oxygen is involved. Opposite of reduction.
Oxygen Deficiency	An atmosphere having less than the percentage of oxygen found in normal air.
P	
Particulate Matter	A suspension of fine solid or liquid particles in air, such as dust, fog, fume, mist, smoke, or sprays. Particulate matter suspended in air is commonly known as an aerosol.
Pathogen	A specific causative agent (as a bacterium or virus) of disease.
Permissible Exposure Limit (PEL)	The legally enforced exposure limit for a substance established by the U.S. Occupational Safety and Health Administration. The PEL indicates the permissible concentration of air contaminants to which nearly all workers may be repeatedly exposed eight (8) hours a day, forty (40) hours a week, over a working lifetime (30 years) without adverse health effects.
Permit	An authorization, license, or equivalent control document issued by EPA or an "approved State" to implement the requirements of this part and Parts 123 and 124. "Permit" includes an NPDES "general permit" (40 CFR 122.28). Permit does not include any permit which has not yet been the subject of final agency action, such as a "draft permit" or a "proposed permit."
Personal Protective Equipment (PPE)	Devices worn by the worker to protect against hazards in the environment.
Pesticide	Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant.
Pesticides	General term for that group of chemicals used to control or kill such pests as rats, insects, fungi, bacteria, weeds, etc., that prey on man or agricultural products. Pesticides include insecticides, herbicides, fungicides, rodenticides, miticides, fumigants, and repellents.
Point Source	Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.
Pollutant	Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radio active materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.
Pollution	Synthetic contamination of soil, water, or atmosphere beyond that which is natural.

SHEMP Operations Manual for Laboratories

Glossary

P (continued)	
Pollution Prevention	Methods prohibiting contamination of the environment with man-made waste.
Polychlorinated Biphenyl (PCB)	Any halogenated organic compound identified in 40 CFR Part 761.
Preventive Maintenance	The systematic actions performed to maintain equipment in normal working condition and prevent failure.
Process for Commercial Purposes	The preparation of a chemical substance or mixture after its manufacture for distribution in commerce with the purpose of obtaining an immediate or eventual commercial advantage for the processor.
Process Wastewater	Any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.
Propose to Manufacture, Import, or Process	A person has made a firm management decision to commit financial resources for the manufacture, import, or processing of a specified chemical substance or mixture.
Protective Factor (PF)	With respiratory protective equipment--the ratio of the ambient airborne concentration of the contaminant to the concentration inside the facepiece.
Publicly Owned Treatment Works ("POTW")	Any device or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality." This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.
Q	
Quality Assurance (Quality Control)	A management function to assure that the products or goods are produced as intended.
Quality Factor	A principal modifying factor which is used in radiation protection for deriving the dose equivalent (H), from absorbed dose. The quality factor is a linear-energy-transfer (LET) dependent factor selected to account for the relative biological effectiveness of the radiation in question, and is independent of the tissue or organ under consideration.
R	
Rad	The conventional unit for absorbed dose of ionizing radiation. 1 Rad = 0.01 gray.
Radar	A radio detecting instrument, able to measure distance and/or speed of an object.
Radiation Source	An apparatus or a material emitting, or capable of emitting, ionizing radiation.
Radiation (Nuclear)	The emission of atomic particles or electromagnetic radiation from the nucleus of an atom.
Radiation (Thermal)	The transmission of energy by means of electromagnetic waves longer than visible light. Radiant energy of any wavelength may, when absorbed, become thermal energy and result in the increase in the temperature of the absorbing body.

SHEMP Operations Manual for Laboratories

Glossary

R (continued)	
Radiation Area	An area in which the external radiation exposure is 0.25 millirem per hour (2.5 microsieverts per hour) or greater.
Radiation Safety Officer (RSO)	The EPA person, often a health physicist, qualified by virtue of education, training and/or professional experience, who ensures that all work activities are conducted in accordance with the requirements of the Radiation Safety and Health Protection Program and any applicable facility licenses.
Radiator	That which is capable of emitting energy in wave form.
Radioactive	The property of an isotope or element that is characterized by spontaneous decay and emission of radiation.
Radiological Area	Any area within a plant, facility, or work site in which radioactive materials or elevated radiation fields are present or in which access is controlled to protect individuals from radiation or radioactive materials, but where operations and job activities result in only limited potential for non-work surface contamination. Radiological areas may include radiation areas, high radiation areas, contamination areas, and airborne radioactivity areas.
Radionuclide	A type of atom which spontaneously undergoes radioactive decay.
Radon Progeny	The radioactive decay products of radon-222, principally the short-lived radioactive decay chain from polonium-218 to polonium-214.
RCRA	The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976.
Reactivity	Characteristic of undergoing violent changes (e.g., reacting violently with water, becoming explosive, reacting violently with sulfide- and cyanide-bearing wastes, etc.).
Reagent	A substance used (as in detecting or measuring a component, in preparing a product, or in developing photographs) because of its chemical or biological activity.
Recycling	The effective reuse of a waste as a substitute for a commercial product or as an industrial process; this means use, reuse, or reclamation of a waste, either on- or off-site, after it is generated by a process. It also refers to reclaiming useful constituent fractions within a waste material or removing contaminants from a waste to allow it to be reused.
Reference Levels	Limits which may be expressed in terms of any useful parameter. They are used to determine a course of action, such as recording, investigation, or intervention, when the value of a parameter exceeds or is projected to exceed the reference level.
Regulated Asbestos-Containing Material (RACM)	(a) Friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this Subpart.
Reliability	The degree to which an instrument, component, or system retains its performance characteristics over a period of time.

SHEMP Operations Manual for Laboratories

Glossary

R (continued)	
Rem	The unit of dose equivalent (H) for any type of ionizing radiation absorbed by body tissue in terms of its estimated biological effect, relative to an absorbed dose from exposure to one roentgen of high energy gamma or x-rays.
Renovation	Altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations in which load-supporting structural members are wrecked or taken out are demolitions.
Respirable Size Particulates	Particles in the size range that permits them to penetrate deep into the lungs upon inhalation.
Respirator	A device to protect the wearer from inhalation of harmful contaminants.
Respiratory Protection	Devices that will protect the wearer's respiratory system from overexposure by inhalation to airborne contaminants.
Respiratory System	Consists of (in descending order)—the nose, mouth, nasal passages, nasal pharynx, pharynx, larynx, trachea, bronchi, bronchiole, air sacs (alveoli) of the lungs, and muscles of respiration.
Restricted Area	Any area for which access is controlled for purposes of protection of individuals from exposure to radiation and radioactive materials.
Reuse	The use of a product more than once in the same form for the same purpose (e.g., when a soft drink bottle is returned to the bottling company for refilling).
Risk Assessment	The process by which the results of a risk analysis (i.e., risk estimates) are used to make decisions, either through relative ranking of risk reduction strategies or through comparison with risk targets.
Risk	The combination of the expected frequency (e.g., events/year) and consequence (e.g., effects/events) of a single accident or a group of accidents.
Root Cause	A systematic method by which the underlying factor(s) leading to an event are determined.
S	
Safety Can	An approved container, of not more than five gallon capacity, having a spring-closing lid and spout cover, and so designed that it will safely relieve internal pressure when subjected to fire exposure.
Sample Container	The inner container of a shipping package that provides the primary containment of the radioactive material or sample.
Sampling	A process consisting of the withdrawal or isolation of a fractional part of a whole.
Sanitize	To reduce the microbial flora in or on articles, such as eating utensils, to levels judged safe by public health authorities.
Satellite Accumulation Area	Accumulation area located near the point of generation where up to 55 gallons of hazardous waste, or one quart of acute hazardous waste, can be accumulated.

SHEMP Operations Manual for Laboratories

Glossary

S (continued)	
Schedule of Compliance	A schedule of remedial measures included in a “permit,” including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the CWA and regulations.
Secondary Industry Category	Any industry category which is not a “primary industry category.”
Self-Contained Breathing Apparatus (SCBA)	A respiratory protection device that consists of a supply or a means of respirable air, oxygen, or oxygen generating material, carried by the wearer.
Septage	The liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.
Sewage Sludge	Any solid, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced waste water treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.
Sewage From Vessels	Human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes that are discharged from vessels and regulated under section 312 of CWA, except that with respect to commercial vessels on the Great Lakes this term includes graywater. For the purposes of this definition, “graywater” means galley, bath, and shower water.
Shipping Package	The outer container in which radioactive material or a potentially contaminated sample is received at the laboratory.
Short-Term Exposure Limit (STEL)	See TLV.
Sievert (Sv)	The unit of dose equivalent: 1 Sievert = 100 rem = 1 Joule per kilogram.
Sludge	Accumulated semi-liquid suspension of settled solids deposited from wastewaters or other fluids in tanks or basins.
Small Quantities Solely for R&D	Quantities of a chemical substance manufactured, imported, or processed or proposed to be manufactured, imported, or processed solely for research and development that are not greater than reasonably necessary for such purposes.
Small Quantity Generator (SQG)	A generator who generates between 100 to 1,000 kilograms, or less than or equal to one kilogram of acutely hazardous waste, in a calendar month.
Smoke	An air suspension (aerosol) of particles, originating from combustion or sublimation.
Smoke Tube	A glass tube packed with a chemically treated sorbent which releases a “chemical smoke” when moist air is passed over it.
Solid Waste	Garbage, refuse, sludge, and other discarded solid material resulting from industrial and commercial operations and from community activities.
S (continued)	

SHEMP Operations Manual for Laboratories

Glossary

Solvent	A substance that dissolves another substance.
Sorbent(s)	(1) A material that removes toxic gases and vapors from air inhaled through a canister or cartridge. (2) Material used to collect gases and vapors during air-sampling. (3) Nonreactive materials used to clean up chemical spills. Examples: clay and vermiculite.
Sound Pressure Level (SPL)	The level, in decibels, of a sound is 20 times the logarithm to the base 10 of the ratio of the pressure of this sound to the reference pressure. The reference pressure must be explicitly stated.
Sound Level	A weighted sound pressure level, obtained by the use of metering characteristics and the weighing A, B, or C specified in ANSI S1.5.
Sound	An oscillation in pressure, stress, particle displacement, particle velocity, etc., that is propagated in an elastic material, in a medium with internal forces (e.g., elastic, viscous), or the superposition of such propagated oscillations.
Sound-Level Meter and Octave-Band Analyzer	Instruments for measuring sound pressure levels in decibels referenced to 0.0002 microbars.
Source Reduction	The minimization, to the extent feasible, of waste that is generated or subsequently treated, stored, or disposed. It includes and activity undertaken by a generator that results in (1) the reduction of the total volume or quantity of waste; (2) the reduction of toxicity of the waste; or (3) both (1) and (2), as long as the reduction is consistent with the goal of minimizing present and future threats to human health and the environment.
Source	The specific operation(s) at a facility that generate a waste stream.
Special Waste	Solid waste requiring handling other than that normally required for municipal solid waste.
Specific Gravity	The weight of a material compared to the weight of an equal volume of water; an expression of the density (or heaviness) of the material.
Specific Weight	The weight per unit volume of a substance; same as density.
Spent Solvents	Solvents no longer fit for use without being regenerated, reclaimed, or otherwise reprocessed.
Spill Event	A discharge of oil into or upon the navigable waters of the United States or adjoining shorelines in harmful quantities, as defined at 40 CFR Part 110.
Standard Methods	Detailed procedures for implementing the requirements of the Radiation Safety and Health Protection Program and its Standard Operating Practices.
Standard Man	A theoretical physically fit man of standard (average) height, weight dimensions, and other parameters (e.g., blood composition, percentage of water, mass of salivary glands, etc.).
Static Pressure	The potential pressure exerted in all directions by a fluid at rest.

SHEMP Operations Manual for Laboratories

Glossary

S (continued)	
Steam Generating Unit	A device that combusts any fuel or byproduct/waste to produce steam or to heat water or any other heat transfer medium. This term includes any municipal-type solid waste incinerator with a heat recovery steam generating unit or any steam generating unit that combusts fuel and is part of a cogeneration system or a combined cycle system. This term does not include process heaters as they are defined in NSPS, Subparts Db and Dc.
Steam Generating Unit Operating Day	A 24-hour period between midnight and the following midnight during which any fuel is combusted at any time in the steam generating unit. It is not necessary for fuel to be combusted continuously for the entire 24-hour period.
Sterilization	The process of making sterile; the killing of all forms of life.
Storage	The interim containment of solid waste after generation and prior to collection for ultimate recovery or disposal.
Supplied-Air Respirators	Air line respirators or self-contained breathing apparatus.
Suspect Carcinogen	A material that is believed to be capable of causing cancer but for which there is limited scientific evidence.
Systemic Toxicity	Adverse effects caused by a substance that affects the body in a general rather than local manner.
T	
Tank System	A hazardous waste storage or treatment tank and its associated ancillary equipment and containment system.
Tank	A stationary device, designed to contain an accumulation of hazardous waste which is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic), which provides structural support.
Tenosynovitis	Inflammation of the connective tissue sheath of a tendon.
Teratogen	A substance or agent to which exposure of a pregnant female can result in malformations in the fetus. An example is thalidomide.
Teratogenic	Any substance having properties which cause malformations of the fetus.
Thermoluminescent Dosimeter (TLD)	A device used for monitoring whole body personal radiation exposure.

SHEMP Operations Manual for Laboratories

Glossary

T (continued)	
Threshold Limit Values (TLVs)	<p>Threshold limit value; a term used by ACGIH to express the airborne concentration of a material to which <i>nearly</i> all persons can be exposed day after day, without adverse effects. ACGIH expressed TLVs in three ways:</p> <p><i>TLV-C</i>. The Ceiling limit—the concentration that should not be exceeded even instantaneously.</p> <p><i>TLV-STEL</i>. The Short-Term Exposure Limit, or maximum concentration for a continuous 15-minute exposure period (maximum of four such periods per day, with at least 60 minutes between exposure periods, and provided that the daily TLV-TWA is not exceeded).</p> <p><i>TLV-TWA</i>. The allowable Time Weighted Average concentration for a normal 8-hour work day or 40-hour work week.</p>
Threshold	The level where the first effects occur; also the point at which a person just begins to notice the tone is becoming audible.
Time-Weighted Average Concentration (TWA)	Refers to concentrations of airborne toxic materials that have been weighted for a certain time duration, usually 8 hours.
Total Effective Dose Equivalent (TEDE)	The sum of the deep-dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).
Toxic Substance	Any substance that can cause acute or chronic injury to the human body, or which is suspected of being able to cause diseases or injury under some conditions.
Toxicity	A relative property of a chemical agent, refers to a harmful effect on some biologic mechanism and the condition under which this effect occurs.
Toxicology	Branch of science which studies the poisonous effects of substances.
Toxin	A poisonous substance that is derived from an organism.
Trade Name	The commercial name or trademark by which a chemical is known.
Trade Secret	Any confidential formula, pattern, process, device, information or compilation of information (including chemical name or other unique chemical identifier) that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it.
Transport	The off-site transportation of wastes by air, rail, highway, or water.
Transportation-related and non-transportation-related as applied to an onshore or offshore facility	Defined in the Memorandum of Understanding between the Secretary of Transportation and the Administrator of the Environmental Protection Agency, dated November 24, 1971, 36 FR 24080.

SHEMP Operations Manual for Laboratories

Glossary

T (continued)	
Treatment	Any method, technique, or process (including neutralization) designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to (1) either neutralize such wastes or recover energy or material resources from the waste; (2) render such waste non-hazardous or less hazardous; (3) make it safer for transport, storage, or disposal; (4) make it amenable for storage; or (5) reduce its volume.
Treatment, Storage and Disposal Facility (TSDF)	A facility that treats, stores, or disposes of hazardous waste(s) received from generator(s).
U	
Ultraviolet	Those wavelengths of the electromagnetic spectrum that are shorter than those of visible light and longer than x-rays, 10^{-5} cm to 10^{-6} cm wavelength.
Uncontrolled Area	Any area in which access is not controlled for purposes of protection of individuals from exposure to radiation and radioactive materials.
Unidentifiable Waste	A waste of unknown composition or characteristics.
United States	The States, the District of Columbia, the Commonwealth of Puerto Rico, the Canal Zone, Guam, American Samoa, the Virgin Islands, and the Trust Territory of the Pacific Islands.
Upper Explosive Limit (UEL)	The highest concentration (expressed in percent vapor or gas in the air by volume) of a substance that will burn or explode when an ignition source is present. (See Lower Explosive Limit and Flammable Range.)
V	
Vapor	Similar to gas, but can be liquefied by increased pressure.
Vapors	The gaseous form of substances that are normally in the solid or liquid state (at room temperature and pressure).
Velometer	A calibrated instrument used to measure air velocity.
Ventilation	Circulating fresh air to replace contaminated air. Dilution ventilation is airflow designed to dilute contaminants to acceptable level. Mechanical ventilation is air movement caused by a fan or other air moving device. Natural ventilation is air movement caused by wind, temperature difference, or other nonmechanical factors.
Very Low Sulfur Oil	An oil that contains no more than 0.5 weight percent sulfur or that, when combusted without sulfur dioxide emission control, has a sulfur dioxide emission rate equal to or less than 215 nanograms per joule (0.5 pounds per million British thermal units) heat input.
Vessel	Every description of watercraft or other artificial contrivance used, or capable of being used as a means of transportation on water, other than a public vessel.

SHEMP Operations Manual for Laboratories

Glossary

V	
Vibration	An oscillating motion about an equilibrium position produced by a distributing force.
Volatile	Percent volatile by volume; the percentage of a liquid or solid (by volume) that will evaporate at an ambient temperature of 70°F (unless some other temperature is stated). Examples: butane, gasoline, and paint thinner (mineral spirits) are 100 percent volatile; their individual evaporation rates vary, but over a period of time each will evaporate completely.
Volt	The practical unit of electromotive force or difference in potential between two points in an electrical field.
W	
Walk-through survey	An activity whose purpose is to identify potential safety and/or health hazards.
Waste	Any material discarded as worthless, defective, or of no further use which, when disposed of, may pose a threat to human health or the environment.
Waste Generation	The act or process of producing a waste.
Waste Shipment Record	The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.
Waste Storage Container	Receptacle used for the temporary storage of waste while it awaits collection.
Waste Stream	A specific type of waste leaving a facility or operation.
Waters of the United States or Waters of the U.S.	<p>(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide</p> <p>(b) All interstate waters, including interstate "wetlands"</p> <p>(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce</p> <p>(d) All impoundments of waters otherwise defined as waters of the United States under this definition</p> <p>(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;</p> <p>(f) The territorial sea</p> <p>(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition</p>
Watt (w)	A unit of electrical power, equal to one joule per second.
Weighting Factor (W _T)	A factor indicating the relative risk of cancer induction or hereditary defects from irradiation of a given tissue or organ, used in calculating the effective dose equivalent.
Wood	Wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including, but not limited to, sawdust, sander dust, wood chips, scraps, slabs, millings, shavings, and processed pellets made from wood or other forest residues.

SHEMP Operations Manual for Laboratories

Glossary

W (cont.)	
Work	When a force acts against resistance to produce motion in a body, the force is said to work. Work is measured by the product of the force acting and the distance moved through against resistance. The units of measurement are the erg (the joule is 1×10^7 ergs) and the foot-pound.
Work Stress	Biomechanically, any external force acting on the body during the performance of a task. Application of work stress to the human body is the inevitable consequence of performance of any task, and is, therefore, only synonymous with “stressful work conditions” when excessive. Work stress analysis is an integral part of task design.
Workers’ Compensation	An insurance system under law financed by employers that provides payment to injured and diseased employees or relatives, regardless of the cause.
Working Level (WL)	A unit of concentration of radon-222 and its alpha-emitting progeny, equivalent to 100 picocuries per liter of radon-222 in secular equilibrium with its short-lived progeny.
Working Level Months (WLM)	A unit of exposure to radon-222 and its progeny. One WLM is an exposure to a concentration of one WL for one working month (170 hours).
Worst Case Discharge for an Onshore Non-Transportation-Related Facility	The largest foreseeable discharge in adverse weather conditions as determined using the worksheets.

SHEMP Operations Manual for Laboratories

Index

A

Accelerators	D5-9
Accident/Incident Investigation	A3-10, A4-4, B2-9
Air Cleaning Equipment	D4-13
Air Emissions	
Asbestos	C10-12
Inventory	C10-2
Limits	C10-9
Monitoring	C10-6, C10-9
Nitrogen Oxide	C10-6
Ozone-Depleting Substances	C10-11
Particulate Matter	C10-5
Permit	C10-3, C10-11
Prevention	C10-2
Program	C10-2
Radionuclide	C10-9
Recordkeeping and Reporting	C10-7, C10-10
Regulations	C10-2
Sulfur Dioxide	C10-5
Air Quality (Environmental)	C10-1
Air Velocity Measurement	D4-13
Alarm Systems	D5-10
Alpha Particles	C6-13
Animal Research	C2-8, C3-16
Assistant Administrator	A2-7
Audit	A5-3, A5-5

B

Baseline Survey	B2-3
Best-Practice Technology	C9-15
Beta Particles	C6-15
Bioassay	C6-35
Biological Emergency	G2-9, G2-18, G3-10
Biological Hazard Control	D5-6
Biological Monitoring	C5-6
Biological Safety Cabinet	D4-4, F2-28
Biomechanics	C8-7
Blender	F2-9
Bloodborne Pathogens	C3-15
Body Protection	E2-7
Bomb Emergency	G2-8, G2-16, G3-6
Bypass Condition	C12-6

Index

C

Cause Analysis	G4-6
Centrifuge	F2-11
Change Management	B4-1
Change of Scale	D3-3
Chemical Hygiene Officer	A2-12, C4-10
Chemical Hygiene	
Hygiene Management Systems	C4-12
Hygiene Plan	C4-7
Hygiene Training	C4-9
Program	C4-1
Chemical	
Emergency	G2-7, G3-3
Export	C15-4
Fire	G3-3
Import	C15-4
Procurement	F3-2
Purchasing	B4-2
Resistance	E2-10
Storage	F3-17
Transportation	F3-19
Waste	D5-4, F3-19
Chloroform	F3-7
Collateral Duty	A2-14
Command Center Team	G2-5
Complex Analysis (Root Cause)	
Deductive Analysis	G4-9
Inductive Analysis	G4-10
Compressed Gas	F3-11
Conditionally-Exempt Small Quantity Generator	C14-22
Containment	C13-4, D5-5, F2-5
Contamination Survey, Radiation	C6-44
Contingency Plan	C14-16
Contractor Evaluation	A3-7
Contractor Selection	A3-7
Corrosive Materials	D5-3, F3-3
Cost/Benefit Analysis	B2-12, B3-5
Cryogenic	F3-14
Cyanide	F3-7

Index

D

Damage Control Coordinator	G2-6
Decay-in-Storage	C14-27
Decontamination	
Biological	F2-25
General	F2-22
Glassware	F2-24
Design Hazard Review (DHR)	D2-3
Designated Official	G2-5
Dewar Flask	F2-8
Dioxin	F3-6
Discharge Monitoring Report	C12-7
Disinfection	F2-18
Document Control	A4-10
Dose-Response	C5-4
Dry Chemical Extinguishers	D5-12
Ductwork	D4-13

E

Electrical Fire	G3-3
Electrical Safety	F2-11
Electron Microscopes	C6-20
Emergency	
Equipment	G3-1
Notification	G3-2
Plan	G2-4
Preparation	G2-7
Prevention	G2-9
Regulations	G2-2
Emergency Coordinator	G2-6
Emergency Preparation	
Animal	G2-9
Biological	G2-9
Bomb	G2-8
Chemical	G2-7
Evacuation	G2-8
Fire	G2-7
Medical	G2-7
Radiation	G2-9
Emergency Response	G3-2, G3-20
Biological	G3-10
Bomb	G3-6
Chemical	G3-3
Evacuation	G3-8

SHEMP Operations Manual for Laboratories

Index

Fire	G3-2
Medical	G3-4
Natural Disaster	G3-12
Radiation	G3-8
Utility Failure	G3-11
Employee Responsibilities	A2-6
Enclosures	D3-3, D4-8
Energy Conservation	C9-12
Energy Efficient Equipment	C9-14
Energy Management Techniques	C9-14
Engineering Controls	D1-1
EPCRA	C11-1
Release Reporting	C11-5
Tier I/Tier II Reporting	C11-1
Toxic Release Inventory	C11-6
Ergonomics	C3-18, C8-1
Guidelines	C8-3
Hazard Prevention and Control	C8-10
Job Design	C8-8
Material Handling	C8-13
Surveys	C8-10, C8-13
Tool Design	C8-10
Work Postures	C8-14
Workplace Design	C8-8
Ether Peroxide	F3-10
Evacuation	G2-8, G3-8
Exhaust Fan	D4-13
Exposure Assessment	C5-4
Exposure Controls	C4-9
Exposure Monitoring	C5-4
Exposure Routes	B2-10
External Monitoring	C6-34
Extinguishing Systems	D5-13
Eye Protection	E2-5
Eyewash	E4-1
Inspection	E4-5
Labeling	E4-4
Location	E4-3
Maintenance	E4-5
Specifications	E4-6
Training	E4-5
Use	E4-4
Water Flow and Control	E4-4

Index

F	
Face Protection	E2-5
Face Velocity	D4-11
Facility Construction	C9-13
Failure Analysis	C13-4
Fault Tree Analysis	B3-1, G4-9
Fetal Protection, Radiation	C6-29
Film Badges	C6-33
Fire	G3-2
Chemical	G3-3
Electrical	G3-3
Gas	G3-3
Solvent	G3-3
Fire Detection	C3-19, D5-10
Fire Emergency Preparation	G2-7
Fire Extinguisher	D5-13
Fire Prevention	G2-11
First Aid	F3-5
Fishbone Diagram	G4-8
Fit-Check	E3-7
Fit-Test	E3-4
Flammable Materials	D5-2, F3-4
Floor Team	G2-6
Foam Extinguisher	D5-14
Foot Protection	E2-8
Formaldehyde	C2-10, C3-11, F3-6
Fume Hood	D4-3, F3-5
G	
Gamma Rays	C6-15
Gas Fire	G3-3
Geiger-Mueller (GM) Survey Meter	C6-41
General Ventilation	D4-3
Glassware	F2-15
Guarding	F2-13
H	
Hand Protection	E2-6
Hazard Communication	A3-7
Hazard Communication Standard	C4-3
Hazard Consequence	B3-3
Hazard Identification	B2-3, C4-5
Hazard Probability	B3-3
Hazard Reporting	B2-8
Hazardous Waste	C14-11

SHEMP Operations Manual for Laboratories

Index

Hazardous Waste Treatment	C14-20
HAZOP	B3-1
Head Protection	E2-7
Hearing Protection	C2-16, E2-9
Heating Equipment	F2-11
HEPA Filter	D4-4
Hepatitis B Vaccination	C2-7
Hood Inspection and Maintenance	D4-9
Housekeeping	F2-2, F3-8, G2-15
Hydrogen Generator	F3-17
I	
Illumination	D5-19
Incentive Programs	A2-16
Incident Investigation	G4-1
Incident Investigation Report	G4-11
Incompatible Chemicals	F3-17
Industrial Hygiene	B2-5, C5-1, C6-25
Area Monitoring	C5-5
Employee Notification	C5-10
Evaluation of Sampling Results	C5-9
Monitoring Equipment	C5-6
Recordkeeping	C5-10
Sampling Collection Difficulties	C5-9
Sampling Plan	C5-7
Sampling Strategy	C5-8
Infectious Waste	C14-22
Inspections	A5-3, B2-8
Interviews, Incident Investigation	G4-5
Ionizing Radiation	C6-2
Isolation of Operations	D3-3
J	
Job Hazard Analysis	B2-6, C8-10
Job Performance Measure	A2-15
L	
Laboratory Design	D2-1
Laboratory Director	A2-10
Laboratory Equipment	F2-6
Laboratory Exposure Assessment Program	C4-7
Laboratory Hygiene	F2-2
Laboratory Manager	A2-10
Land Disposal Restrictions	C14-17
Large Quantity Generator	C14-16, C14-21

SHEMP Operations Manual for Laboratories

Index

Laser	C6-6, D5-6
Laser Beam Hazards	C6-24
Lever System	C8-7
Lifting	C8-14
Light Measurement	D5-20
Liquid Scintillation Counting	C6-43
M	
Management Oversight and Risk Tree Analysis (MORT)	G4-10
Manifest	C14-19
Material Handling Techniques	C8-13
Material Safety Data Sheet (MSDS)	C4-5
Mechanical Safety	F2-13
Medical Coordinator	G2-6
Medical Emergency	G2-7, G2-16, G3-4
Medical Treatment	C2-4
Medical Surveillance	
Animal Research	C2-8
Bloodborne Pathogens	C2-6
Ergonomics	C8-12
Examinations	C2-2
Formaldehyde	C2-9
Hearing Protection	C2-16
Methylene Chloride	C2-13, C3-11
Program	C2-1
Recordkeeping	C2-18
Respiratory Protection	C2-16, E3-4
Surveillance Requirements	C2-6
Methylene Chloride	C2-13, C3-11, F3-6
Microwave Sample Preparation	F10-2
N	
Natural Disaster	G3-12
Needs Assessment	C3-3, D2-3
NESHAPs	C10-3
Noise Control	D5-16
Non-Beam Hazards	C6-25
Nonhazardous Waste	C14-10
Nonionizing Radiation	C6-5
NPDES	C12-4
NPDES Permit Conditions	C12-8
NSPS	C10-3
O	
Occupant Emergency Plan	C3-19, G2-4
Opportunity Assessment, Pollution Prevention	C9-4

SHEMP Operations Manual for Laboratories

Index

Organic Peroxide	F3-9, F3-19
OSHA 200-F Form	A4-4
OSHA Laboratory Standard	C4-2, C5-3
Overnight Operations	F2-4
Oxidizers	D5-4
Ozone Generator	F3-16
P	
Particle Accelerator	C6-20
PCBs	C15-4, F3-8
Recordkeeping	C15-6
Spill	C15-6
Storage	C15-5
Survey and Labeling	C15-5
Waste	C14-31
Perchloric Acid	F3-10
Personal Exposure Monitoring	C5-5, C6-33
Personal Protective Equipment	C6-47, E2-1
Durability/Flexibility	E2-11
Hazard Assessment	E2-3
Performance Requirements	E2-9
Selection	E2-4
Types	E2-5
Personnel Involvement	B2-11
Pesticides	F3-8
Placard	C14-19
Pollution Prevention	C9-1
Pollution Prevention Program	C9-3
POTW	C12-4
Power Generation	G2-10
PPE	C3-16, F3-5
Pretreatment	C12-4
Process Change	D3-1
Process Safety Management	B2-6
Procurement	C9-6, C9-12
R	
Radiation Control	D5-6
Radiation Damage	C6-21
Radiation Effects	C6-23
Eye	C6-23
Skin	C6-24
Radiation Emergency	G2-9, G2-17, G3-8
Radiation-Generating Devices	C6-7
Radiation Safety	C6-1

SHEMP Operations Manual for Laboratories

Index

Committee	C6-9
Exposure Limits	C6-28
Exposure Monitoring	C6-3
Hazards	C6-20
Ionizing Radiation	C6-2
Lasers	C6-6
Maximum Permissible Doses	C6-28
Medical Surveillance	C6-37
Monitoring	C6-33
Nonionizing Radiation	C6-5
Officer	C6-9
Posting/Labeling	C6-37
Program	C6-33
Program Effectiveness	C6-39
Regulations and Guidelines	C6-2
Responsibilities	C6-8
Survey	C6-41
Training	C6-37
Transport	C6-40
Work Practice Controls	C6-39
Radiation Sources	C16-3
Radiation Survey	
Lasers	C6-47
Radiation-Generating Devices	C6-46
Radiation Survey Equipment	C6-42
Radioactive Waste	C14-23
Radiosensitivity	C6-21
Reactives	D5-4, F3-9
Recordkeeping	A4-1
Recycling	C9-8
Recycling Resources	C9-10
Refrigerator	F2-9
Regional Administrator	A2-9
Research Protocol	B4-3
Respirator	
Cleaning	E3-9
Fit-Check	E3-7
Inspection	E3-8
Maintenance	E3-8
Protection Factor	E3-6
Selection	E3-5
Storage	E3-10
Use	E3-7

Index

Respiratory Protection	C2-16, E3-1
Fit-Test	E3-4
NIOSH	E3-3
Medical Evaluation	E3-4
Program	E3-3
Recordkeeping	E3-10
Training	E3-5
Risk Analysis	B1-1
Risk Assessment	B3-1
Risk Screening	B3-2
Root Cause	B2-11, G4-6, G4-7
S	
Safety Shower	E4-1
Inspection	E4-5
Labeling	E4-4
Location	E4-3
Maintenance	E4-5
Specifications	E4-6
Training	E4-5
Use	E4-4
Water Flow and Control	E4-4
Sampling	
Area	C5-5
Personal	C5-5
Wipe	C5-6
Security	A3-6, C13-5
SHE	
Contractor	A3-1
Committee	A2-19
Goals	A2-4
Policy	A2-2, A3-4
Visitor	A3-1
SHEM Director	A2-8
SHEMP Manager	A2-10
Signage	F2-4, F3-6, F3-9
Simple Root Cause Analysis	G4-6
Small Quantity Generator	C14-17, C14-21
Smoke Tube Testing	D4-12
Solvent Fire	G3-3
SPCC	C3-21, C13-1
Amendments	C13-7
Plan Contents	C13-3
Plan Requirements	C13-2

Index

State Programs	C13-7
Training	C13-6
Special Waste	C14-30
Spill	
PCB	C15-6
Prevention	G2-16
Toxic	F3-5
Spill Prevention Control and Countermeasure Plan	C13-1
Spill History	C13-3
Sprinkler Systems	D5-12
Standard Operating Procedures (SOPs)	A4-3, B2-5, B2-7
Steam Generating Units	C10-4
Sterilization	F2-18
Storage	
Chemical Waste	D5-4
Chemicals	D5-2
Corrosives	D5-3
Flammables	D5-2
Oxidizers	D5-4
Reactives	D5-4
Stormwater	C12-1, C12-4, C12-8
Substance-Specific Standards	C5-3
Substitution	D3-2
Process	D3-2
Materials	D3-2
Substitution Equipment	D3-3
Syringe	F2-17
T	
Tank Inspection	C13-4
Team Root Cause Analysis	G4-7
Thermoluminescent Dosimeters	C6-37
Tier I/Tier II Reporting	C11-3
Torque	C8-7
Toxic Gas Detection	D5-11
Toxic Materials	F3-5
Toxic Substance Control Act	C15-1
Toxic Substance Control Requirements	C15-3
Tracking/Trending	B2-9
Training	C3-1
Animal Research	C3-16
Biosafety	C3-14
Bloodborne Pathogens	C3-15
Chemical Hygiene	C3-8

SHEMP Operations Manual for Laboratories

Index

Chemical-Specific	C3-10
DOT	C3-22
Emergency Response	C3-20
Ergonomics	C3-18, C8-13
Fire Safety	C3-19
Hazardous Waste	C3-20
Occupant Emergency Plan	C3-19
Protective Clothing and Equipment	C3-16
Radiation Safety	C3-11
Respiratory Protection	C3-17, E3-5
SHE Refresher	C3-7
SPCC	C3-22
Training Conduct	C3-6
Training Evaluation	C3-6
Training Guidelines	C3-3
Training Methods	C3-5
Training Program	C3-4
Training Records	A4-8, C3-23
Training Requirements	C3-7
Training Resources	C3-23
TRI Reporting	C11-6
TSCA	C15-1
U	
Ultraviolet Radiation	C6-32
Unattended Operations	F2-4
Upset Condition	C12-6
Utility Failure	G2-10, G3-12
V	
Vacuum Pump	F2-8
Vacuum Vessel	F2-8
Ventilation	
Design	D4-6
Performance	D4-7
Work Practices	D4-7
W	
Walk-Through Survey	B2-4
Waste Management	C14-1
Disposal	C14-8, C14-20
Documentation	C14-10
Hazardous	C14-11
Identification/Characterization	C14-4
Infectious	C14-22
Laboratory	C14-6

Index

Large Quantity Generator	C14-16, C14-21
Manifest	C14-19
Minimization	C14-9
Nonhazardous	C14-10
PCB	C14-31
Process	C14-3
Radioactive	C14-23
Small Quantity Generator	C14-17, C14-21
Special	C14-30
Storage	C14-7, C14-20
Recordkeeping	C14-20
Treatment	C14-20
Transportation	C14-8
Wastewater	C12-1
Discharge Inventory	C12-3
Discharge Prevention	C12-3
Monitoring	C12-6
Work Postures	C8-14
Work Practice Controls	C6-39, C8-12, F3-1
Chemicals	F3-2
Corrosives	F3-3
Flammables	F3-4
General	F2-3
Toxics	F3-5
Reactives	F3-9
Compressed Gases	F3-11
Work-Related Musculoskeletal Disorders	C8-3, C8-13
Work Surfaces	D5-2
Working Along	F2-6
Worksite Analysis	C8-8
X	
Xrays	C6-15
X-Ray Equipment	C6-20, D5-9