ABSTRACT

The MARSSIM provides information on planning, conducting, evaluating, and documenting building surface and surface soil final status radiological surveys for demonstrating compliance with dose or risk-based regulations or standards. The MARSSIM is a multi-agency consensus document that was developed collaboratively by four Federal agencies having authority and control over radioactive materials: Department of Defense (DOD), Department of Energy (DOE), Environmental Protection Agency (EPA), and Nuclear Regulatory Commission (NRC). The MARSSIM's objective is to describe a consistent approach for planning, performing, and assessing building surface and surface soil final status surveys to meet established dose or risk-based release criteria, while at the same time encouraging an effective use of resources.

DISCLAIMER

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ABBREVIATIONS

AEA	Atomic Energy Act
AEC	Atomic Energy Commission
AFI	Air Force Instructions
ALARA	as low as reasonably achievable
AMC	Army Material Command
ANSI	American National Standards Institute
AR	Army Regulations
ASTM	American Society of Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
CAA	Clean Air Act
Capt.	Captain (Air Force)
CAPT	Captain (Navy)
CDR	Commander
CEDE	committed effective dose equivalent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CHP	Certified Health Physicist
CPM	counts per minute
DARA	Department of the Army Radioactive Material Authorization
DCF	dose conversion factor
DCGL	derived concentration guideline level
DEFT	Decision Error Feasibility Trials
DLC	Data Life Cycle
DOD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
DQA	Data Quality Assessment
DQO	Data Quality Objectives
EERF	Eastern Environmental Radiation Facility
Ehf	human factors efficiency
EMC	elevated measurement comparison
EML	Environmental Measurements Laboratory
EMMI	Environmental Monitoring Methods Index
EPA	Environmental Protection Agency
EPIC	Environmental Photographic Interpretation Center
ERAMS	Environmental Radiation Ambient Monitoring System

ABBREVIATIONS

FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FRDS	Federal Reporting Data System
FSP	Field Sampling Plan
FWPCA	Federal Water Pollution Control Act
FUSRAP	Formerly Utilized Sites Remedial Action Program
GEMS	Geographical Exposure Modeling System
GM	Geiger-Mueller
GPS	global positioning system
GRIDS	Geographic Resources Information Data System
GWSI	Ground Water Site Inventory
H_0	null hypothesis
H_a	alternative hypothesis
HSA	Historical Site Assessment
HSWA	Hazardous and Solid Waste Amendments
ISI	Information System Inventory
L_C	critical level
L_D	detection limit
LBGR	lower bound of the gray region
LCDR	Lieutenant Commander
LLRWPA	Low Level Radioactive Waste Policy Act as Amended
LT	Lieutenant
MARLAP	Multi-Agency Radiation Laboratory Analytical Protocols (Manual)
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCA	multichannel analyzer
MDC	minimum detectable concentration
MDCR	minimum detectable count rate
MED	Manhattan Engineering District
NARM	naturally occurring or accelerator produced radioactive material
NCAPS	National Corrective Action Prioritization System
NCRP	National Council on Radiation Protection and Measurements
NCP	National Contingency Plan
NIST	National Institute of Standards and Technology
NORM	naturally occurring radioactive material
NPDC	National Planning Data Corporation

ABBREVIATIONS

NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NWPA	Nuclear Waste Policy Act
NWWA	National Water Well Association
ODES	Ocean Data Evaluation System
ORNL	Oak Ridge National Laboratory
ORISE	Oak Ridge Institute for Science and Education
PERALS	photon electron rejecting alpha liquid scintillator
PIC	pressurized ionization chamber
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QMP	Quality Management Plan
RASP	Radiological Affairs Support Program
RAGS/HHEM	Risk Assessment Guidance for Superfund/Human Health Evaluation Manual
RC	release criterion
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RODS	Records of Decision System
RSSI	Radiation Survey and Site Investigation
SARA	Superfund Amendments and Reauthorization Act
SAP	Sampling and Analysis Plan
SDWA	Safe Drinking Water Act
SFMP	Surplus Facilities Management Program
SOP	Standard Operating Procedures
STORET	Storage and Retrieval of U.S. Waterways Parametric Data
TEDE	total effective dose equivalent
TLD	thermoluminescence dosimeter
TRU	transuranic
TSCA	Toxic Substances Control Act

ABBREVIATIONS

UMTRCA	Uranium Mill Tailings Radiation Control Act
USGS	United States Geological Survey
USPHS	United States Public Health Service
USRADS	Ultrasonic Ranging and Data System
WATSTORE	National Water Data Storage and Retrieval System
WL	working level
WRS	Wilcoxon rank sum
WSR	Wilcoxon signed ranks
WT	Wilcoxon test

CONVERSION FACTORS

To Convert From	To	Multiply By
acre	hectare	0.405
	sq. meter (m^2)	4,050
	sq. feet (ft^2)	43,600
becquerel (Bq)	curie (Ci)	2.7×10^{-11}
	dps	1
	pCi	27
Bq/kg	pCi/g	0.027
Bq/m^2	dpm/100 cm^2	1.67
Bq/m^3	Bq/L	0.001
	pCi/L	0.027
centimeter (cm)	inch	0.394
Ci	Bq	3.70×10^{10}
	pCi	1×10^{12}
dps	dpm	0.0167
	pCi	27
dpm	dps	60
	pCi	2.22
gray (Gy)	rad	100
hectare	acre	2.47
liter (L)	cm^3	1000
	m^3	0.001
	ounce (fluid)	33.8

To Convert From	To	Multiply By
meter (m)	inch	39.4
	mile	0.000621
sq. meter (m^2)	acre	0.000247
	hectare	0.0001
	sq. feet (ft^2)	10.8
	sq. mile	3.86×10^{-7}
m^3	liter	1,000
mrem	mSv	0.01
mrem/y	mSv/y	0.01
mSv	mrem	100
mSv/y	mrem/y	100
ounce (oz)	liter (L)	0.0296
pCi	Bq	0.037
	dpm	0.45
pCi/g	Bq/kg	37
pCi/L	Bq/m^3	37
rad	Gy	0.01
rem	mrem	1,000
	mSv	10
	Sv	0.01
seivert (Sv)	mrem	100,000
	mSv	1,000
	rem	100