

## Contaminants in the Subsurface: Source Zone Assessment and Remediation (2004)

**Chapter:** Appendix A: Tables on Contaminants at Army and Other Facilities

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# Appendix A

## Tables on Contaminants at Army and Other Facilities

TABLE A-1 Contaminants Reported at the Most Severely Contaminated Army Sites

Installation	Num-ber of Sites	Contaminants	Media Affected	Source Remediation
Aberdeen Proving Ground, MD	254	VOCs, SVOCs, metals (Hg), PCBs, explosives, pesticides, UXO, radiation, chemical weapons/munitions, biological warfare material	Groundwater (GW), surface water (SW), Sediment (Sed), Soil	Removal of soils, underground storage tanks (USTs), dump debris, and UXO
Alabama Army Ammunition Plant, AL	many	Nitroaromatic compounds, heavy metals (Pb), munitions-related waste (explosives), PCBs	GW, SW, Sed, Soil	Incineration and cell storage of contaminated soils
Anniston Army Depot, AL	47	VOCs, heavy metals, phenols, petroleum HCs, acids, caustics	GW, Soil	Removal of soils; hydrogen peroxide injection treatment; SIA GW treatment system
Camp Bonneville, WA	14 AOCs	POLs, solvents, UXO	Soil	Removal of USTs, debris (drums), and soil

Fort Chaffee, AR	many	POLs, DDT, chlordane, TCE	GW, Soil	Removal of USTs, oil–water separators, wash racks, fuel fill stands, and soil; open burning and detonation
Fort Dix, NJ	many	Heavy metals, POLs, chlorinated solvents, PCBs	GW, SW, Sed, Soil	Removal of USTs and soil
Fort Eustis, VA	27	Petroleum HCs, PCBs, VOCs, pesticides, heavy metals	GW, SW, Sed, Soil	Removal of USTs and soil; use of pneumatic pumps and passive skimmers for petroleum removal
Fort George G. Meade, MD	many	Heavy metals, petroleum HCs, VOCs, UXO, asbestos	GW, Soil	Removal of aboveground storage tanks (ASTs), buildings, pits, petroleum drums, and soil
Fort Lewis, WA	many	VOCs (TCE), PCBs, heavy metals, waste oils and fuels, coal liquefaction wastes, PAHs, solvents, battery electrolytes	GW, Soil	GW extraction and treatment systems; P&T systems; removal of TCE drums (air sparging and soil vapor extraction systems shut down in 1999)
Fort McClellan, AL	67	VOCs [(TCE and pentachloroethane (PCA)], SVOCs, pesticides, explosives, metals (Pb), UXO, radioactive sources, nonstockpile chemical material	GW, Soil	Removal of USTs; removal actions at pistol ranges
Fort Ord, CA	61	VOCs (carbon tetrachloride); petroleum HCs, heavy metals (Pb), pesticides	GW, Soil	Removal of “waste”; recycling of Pb; GW P&T systems
Fort Richardson, AK	38	White phosphorus, PCBs, heavy metals, POLs, solvents (TCE), dioxins, chemical agents, UXO, explosives, pesticides	GW, Soil	Removal of USTs, buried drums, and soil; thermal desorption; heat-enhanced soil vapor extraction; pond draining (to reduce white P)
Fort Riley, KS	many	Solvents, pesticides, Pb	GW, SW, Sed, Soil	Removal of soil and incinerators; performed soil vapor extraction pilot test and free-product recovery pilot test
Fort Ritchie, MD	many	UXO, heavy metals, (Pb), asbestos	GW, Soil	Removal of USTs, lead paint, and asbestos
Fort Sheridan, IL	many	Fuel HCs, PAHs, metals, UXO	GW, Soil	Removal of USTs and soil; performed UXO “clearances”
Fort Wainwright, AK	many	POLs, heavy metals, solvents, pesticides, paints, UXO, ordnance compounds, chemical agents	GW, Soil	Removal of soil, drums, fire training pits, and structures; use of air-sparging curtain; removed and recycled old air sparging/soil vapor extraction systems

Installation	Num- ber of Sites	Contaminants	Media Af- fected	Source Remediation
Fort Wingate, NM	many	Explosive compounds, UXO, PCBs, pesticides, heavy metals, asbestos, lead-based paint, nitrates (from TNT)	GW, Soil	Removal of soil; disposal of PCB-contaminated building materials; clearance of UXO from Indian tribal lands
Hamilton Army Air-field, CA	many	Metals, VOCs, SVOCs, fuel HCs, POLs, PCBs, PAHs, pesticides	GW, SW, Sed, Soil	Removal of USTs and soil; removal of onshore fuel lines; flushing, sealing, and abandoning offshore fuel lines
Hingham Annex, MA	many	POLs, heavy metals, VOCs, PCBs, asbestos	GW, SW, Sed, Soil	Removal of USTs, ASTs, oil-water separator, and soil; use of asphalt batching technology
Iowa Army Ammunition Plant, IA	42	Explosives, heavy metals (Pb), VOCs, pesticides	GW, SW, Sed, Soil	Removal of ASTs and soil; excavation and off-site incineration of soils; excavation of explosives-contaminated sumps; creation of wetlands and use of phytoremediation; use of low-temp. thermal desorption; "treatment" of explosives- and metal-contaminated soils
Jefferson Proving Ground, IN	many	Solvents, petroleum HCs, VOCs, PCBs, heavy metals, depleted uranium, UXO	GW, Soil	Removal of USTs; "treatment" of soil; UXO removal operations
Joliet Army Ammunition Plant, IL	53	Explosives, heavy metals, VOCs, PCBs, TNT	GW, Soil	Removal of sludge and soil; removal of UXO debris
Lake City Army Ammunition Plant, MO	73	Explosives, heavy metals, solvents, POLs	GW, Soil	Removal action for sumps; P&T system; extraction wells
Letterkenny, PA	many	VOCs, POLs, PCBs, metals (Hg), explosives, asbestos	GW, SW, Sed, Soil	Removal of fire-training pits, oil burn pits, and other soils; low-temp. thermal treatment
Lexington-Blue Grass Army Depot, KY	67	VOCs, SVOCs, heavy metals (Pb), PCBs, pesticides, herbicides, asbestos	GW, SW, Sed, Soil	Removal of USTs, transformers, asbestos, soil, and lagoon sludge
Lone Star Army Ammunition Plant, TX	many	VOCs, petroleum, heavy metals, explosives	GW, Soil	Removal of soil, cisterns, and fuel storage areas; soil "decontamination"

Louisiana Army Ammunition Plant, LA	7	Oils, grease, degreasers (TCE), phosphates, solvents, metal plating sludges, acids, fly ash, TNT, RDX, HMX	GW, SW, Sed, Soil	Incineration of explosives-contaminated soil
Milan Army Ammunition Plant, TN	38	Munitions-related wastes	GW, Soil	Soil excavation; bioremediation of soil; constructed landfill for bioremediated soil; GW treatment plant (granular activated carbon)
Military Ocean Terminal, Bayonne, NJ	67	Petroleum HCs, BTEX, VOCs, SVOCs, dieldrin, heavy metals, PCBs, asbestos	GW, Soil	Removal of USTs, ASTs, soil–water separators, asbestos from buildings, and soil
Picatinny Arsenal, NJ	156	VOCs, explosives, PCBs, heavy metals, arsenic	GW, SW, Sed, Soil	Removal of USTs, buried drums, contaminated pipe, and soil; use of GW extraction and treatment system; use of GW P&T system

Installation	Number of Sites	Contaminants	Media Affected	Source Remediation
Pueblo Chemical Depot, CO	many (29 potential UXO sites)	Heavy metals, POLs, VOCs, SVOCs, pesticides, explosives, PCBs, and UXO	GW, Soil	Removal of soil; decontamination, demolition, and removal of buildings; GW extraction and treatment systems; sheet-pile barriers; soil bioremediation
Red River Army Depot, TX	many	TCE, pesticides, metals	GW, SW, Sed	Removal of soil and lagoon sludge
Redstone Arsenal, AL	298 (216 Army; 82 Marshall Space Flt.)	Heavy metals, solvents, chemical weapons/munitions, pesticides	GW, SW, Sed, Soil	GW extraction and treatment system; air strippers; soil vapor extraction systems; construction of industrial septic tank system
Riverbank Army Ammunition Plant, CA	6	Chromium, cyanide, zinc	GW, Soil	Removal action at evaporation and percolation ponds; ion exchange system in GW treatment system; GW extraction system
Rocky Mountain Arsenal, CO	209	Pesticides, chemical agents, VOCs, chlorinated organics, PCBs, UXO, heavy metals, solvents, asbestos	GW, Soil	Removal of drums, soil, and asbestos materials; GW excavation and treatment systems; chemical and sanitary sewer plugging; off-post soil tillage
Sacramento Army Depot, CA	16	Waste oil and grease, solvents, metal plating wastes, caustics, cyanide, metals	GW, Soil	Removal of soil; soil vapor extraction systems; air sparging; GW extraction and treatment systems
Savanna Army Depot, IL	many	Explosives, metals (Pb), solvents, POLs, VOCs, UXO, pesticides, TNT	GW, SW, Sed, Soil	Removal of soil; high-temp. thermal treatment; incineration of TNT-contaminated sediment
Seneca Army Depot, NY	36	Chlorinated solvents (TCE), radioactive isotopes, heavy metals, petroleum HCs	GW, SW, Sed, Soil	Removal of USTs and soil
Stratford Army Engine Plant, CT	many	PCBs, asbestos, fuel-related VOCs, solvents, metals (hexavalent chromium), PAHs	GW, SW, Sed, Soil	Removal of USTs
Sudbury Training Annex, MA	74	VOCs, PCBs, pesticides, heavy metals, arsenic, asbestos, UXO	GW, Soil	Removal of drums, USTs, debris, and soil
Sunflower Army Ammunition Plant, KS	many	Nitrates, sulfates, lead, chromium, propellants	GW, SW, Sed, Soil	Removal of USTs and soil; cleanup of asbestos dump
Tobyhanna Army Depot, PA	many	Heavy metals, VOCs, PCBs, POLs, UXO	GW, SW, Sed, Soil	Removal of soil and sewage drying beds

Twin Cities Army Ammunition Plant, MN	25	VOCs, PCBs, heavy metals	GW, SW, Removal of soil; soil vapor extraction system; SVE air sparging system
U.S. Army Soldiers System Center, MA	many	Pesticides, herbicides, pentachlorophenol, solvents, VOCs (TCE)	GW, SW, Removal of waste oil storage tanks, Sed, Soil pavement, and soil
Umatilla Chemical Depot, OR	80	Explosives, UXO, heavy metals (Pb), pesticides, nitrates	GW, Soil Removal of USTs; bioremediation (by windrow composting) of contaminated soils

SOURCE: Defense Environmental Restoration Program: Annual Report to Congress FY2001

TABLE A-2 Contaminants Reported at Other Military Installations

Site	Number of Sites	Contaminants	Media Affected	Source Remediation
Andrews AFB, MD	22	Heavy metals (Ni), SVOCs, VOCs, PAHs, PCBs, pesticides	SW	Soil removal
Bangor Naval Submarine Base, ME	22	Residual TNT, RDX, Otto fuel, VOCs	GW, Sed, Soil	Removal of soils and USTs; P&T systems; closed loop passive soil washing system with granular activated carbon
Barbers Point Naval Air Station, HI	17	PCBs, heavy metals (Pb), petroleum HCs, pesticides, solvents, asbestos	GW, Soil	Removal of USTs
Barstow Marine Corps Logistics Base, CA	38	Heavy metals, PCBs, petroleum HCs, pesticides, herbicides, chlorinated VOCs (TCE)	GW, Soil	Removal of USTs and industrial waste sludge
Bergstrom AFB, TX	30 + 454	Chlorinated VOCs (TCE), pesticides, petroleum HCs, metals, low-level radioactive wastes	GW, Soil	Removal of USTs, ASTs, soil, radioactive wastes; soil vapor extraction and air sparging systems
Camp Lejeune MCB, NC	176	Battery acid, fuels, used oils, paints, thinners, PCBs, pesticides, solvents, metals	GW, SW, Sed, Soil	Remediation systems at 23 sites
Castle AFB, CA	many	TCE, PCBs, POLs, pesticides, cyanide, cadmium	GW, Soil	Removal of soil and USTs; soil vapor extraction systems; oil-water separators; P&T systems; bioventing systems
Hanscom AFB, MA	22	VOCs, chlorinated solvents, gasoline, jet fuel, tetraethyl Pb, PCBs, Hg	GW, SW, Sed, Soil	Removal of soil and USTs; GW/product recovery and soil vapor extraction

Hill AFB, UT	106	Solvents (TCE), sulfuric GW, and chromic acids, SW, metals, petroleum HCs Sed, Soil	P&T systems
Homestead, AFB, FL	26 before/540 after hurricane	Metals (Pb), VOCs, cyanide, pesticides, solvents, PCBs	GW, Soil
Lakehurst Naval Air Engineering Station, NJ	45	Fuels, PCBs, solvents (TCE), waste oils	GW, Soil
Langley AFB, VA	45	Petroleum HCs, chlor-dane, PCBs, heavy metals, solvents	GW, SW, Sed, Soil
			Removal of USTs and soil; GW extraction and treatment; removal of oil-water separators; remedial bioventing systems
			Removal of soil, drums, tanks, and debris; soil washing, asphalt batching, solar-powered soil irrigation and sparge treatment systems; P&T; vapor extraction; soil bioventing
			Removal of USTs and soil; soil vapor extraction system

SOURCE: Defense Environmental Restoration Program: Annual Report to Congress FY2001

TABLE A-3 Prevalence of Organic Contaminants of Concern at Army Installations

Installation	Chlorinated Solvents				Explosives				
	PCE	TCE	cis-1,2-DCE <sup>a</sup>	1,2-DCA	TCA <sup>b</sup>	DNT	TNT	HMX	RDX
Aberdeen Proving Ground	X	X	X	X	X	X	X	X	X
Alabama AAP						X	X		
Anniston AD	X	X							
Badger AAP					X	X			
Blue Grass Army Depot							X	X	X
Blue Grass Army Depot-Lexington	X								
Cameron Station		X							
Camp Bonneville									X
Camp Bullis		X							
Camp Crowder		X	X		X				
Camp Kilmer	X	X	X						
Camp Navajo							X		
Camp Roberts	X	X							
Cold Regions Research Lab		X							
Cornhusker AAP					X		X		X
Devens Reserve Training Facility					X				
Dugway Proving Ground	X	X			X	X	X	X	X
Floyd Wets Site					X				
Fort Belvoir									
Fort Benning		X			X				
Fort Bliss									
Fort Bragg	X	X					X		

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Installation	Chlorinated Solvents				Explosives				
	PCE	TCE	cis-1,2-DCE <sup>a</sup>	1,2-DCA	TCA <sup>b</sup>	DNT	TNT	HMX	RDX
Holston AAP								X	
Hunter Army Airfield	X	X	X		X				
Indiana AAP	X	X			X	X			



Iowa AAP	X	X	X		X	X	X	X	X
Jefferson Proving Ground					X				
Joliet AAP				X	X	X	X		
Kansas AAP				X	X		X	X	X
Kelly Support Facility					X				
Kunia Field Station									
Lake City AAP	X	X	X	X					
Letterkenny Army Depot	X	X	X	X	X		X	X	
Lincoln AMSA	X	X							
Lone Star AAP		X		X			X		X
Longhorn AAP		X		X	X	X	X		
Los Alamos Armed Forces	X	X	X	X					
LTA, Marion ENGR Depot		X	X						
McAlester AAP		X							
Middletown USARC		X							
Milan AAP							X	X	
Military Ocean TML Sunny Point			X						
Newport Chem Depot	X	X	X			X	X	X	X
NTC and Fort Irwin	X	X		X	X	X	X	X	X
Oakland Army Base	X	X	X						
Papago Military Reservation	X								
Phoenix Military Reservation		X							

Picatinny Arsenal		X	X		X	X	X	X	X
Presidio of Monterey			X					X	X
Pueblo Chemical Depot		X	X	X	X	X	X	X	X
Radford AAP		X	X			X	X	X	
Ravenna AAP							X	X	X
Red River Army Depot		X	X	X	X				
Redstone Arsenal			X				X		X
Rock Island Arsenal				X	X				
Rocky Mountain Arsenal				X					
Sacramento Army Depot				X					
Savannah Depot Activity		X	X		X		X	X	X
Seneca Army Depot Activity		X	X	X				X	
Sierra Army Depot			X		X			X	
Soldier Systems Center		X	X			X			
Stratford Army Engine Plant		X	X			X			
Sunflower AAP				X					
Tacony Warehouse		X	X						
Tarheel Army Missile Plant		X	X	X					
Tobyhanna Army Depot		X							
Tooele Army Depot			X				X		X

Twin Cities AAP	X		X	X					
Umatilla Chem Depot						X	X		
USARC Fort Nathaniel Greene									
USARC Kings Mills	X								
Vint Hill Farms Station	X	X							
Volunteer AAP						X	X		
Walter Reed Army Medical									
Watervliet Arsenal	X	X	X		X				
White Sands Missile Range		X		X	X	X			
Yakima Training Center	X								
Yuma Proving Ground						X			

Installation	Chlorinated Solvents					Explosives				
	PCET	TCE	cis-1,2-DCE <sup>a</sup>	1,2-DCAT	TCA <sup>b</sup>	DNT	TN	THM	XR	DX
Totals	51	74	32	24	35	26	30	19	14	
Percentage of all installations with this contaminant	37	54	23	1	25	19	22	14	10	
Number of BRAC installations: 23										
Number of active installations: 115										
Total number of installations: 138										
<sup>a</sup> Does not include other DCE isomers.										
<sup>b</sup> Includes 1,1,1-TCA and 1,1,2-TCA										
SOURCE: Compiled by Laurie Haines, Army Environmental Center.										

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