

APPENDIX G

Human Health Risk Assessment Tables

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Table G-1. SRC and COPC Screening for Shallow Surface Soil (0-1 ft bgs ISM Samples) at the Landfill North of Winklepeck Burning Grounds

Analyte (mg/kg)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b (HQ=0.1 or Risk=10 ⁻⁶)		Risk Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Date Collected at Max Detect
									RA	RC						
<i>Inorganic Chemicals</i>																
Aluminum	7429-90-5	23/ 23	6660	12000	9650	17700	No	Below background	52923	7380	7380	RC	No	Below background	LNWss-042M	11/01/2004
Antimony	7440-36-0	10/ 22	0.11	0.44	0.47	0.96	No	Below background	13.6	2.82	2.82	RC	No	Below background	LNWss-071M	04/01/2010
Arsenic	7440-38-2	23/ 23	7.9	14	10.6	15.4	No	Below background	0.425	0.524	0.425	RA	No	Below background	LNWss-029M	10/25/2004
Barium	7440-39-3	23/ 23	30.8	76	60.2	88.4	No	Below background	8966	1413	1413	RC	No	Below background	LNWss-036M	10/26/2004
Beryllium	7440-41-7	23/ 23	0.32	0.72	0.573	0.88	No	Below background	--	--	16	RSL	No	Below background	LNWss-029M	10/25/2004
Cadmium	7440-43-9	11/ 23	0.1	1.8	0.267	0	Yes	Exceeds background	22.3	6.41	6.41	RC	No	Below risk screening criteria	LNWss-071M	04/01/2010
Calcium	7440-70-2	23/ 23	260	7300	1500	15800	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWss-074M	04/01/2010
Chromium^d	7440-47-3	23/ 23	13	26	18.7	17.4	Yes	Exceeds background	90.4	19.9	19.9	RC	Yes	Exceeds screening level	LNWss-032M	10/26/2004
Cobalt	7440-48-4	23/ 23	5.7	10	8.46	10.4	No	Below background	803	131	131	RC	No	Below background	LNWss-029M	10/25/2004
Copper	7440-50-8	23/ 23	9.7	23.1	14.6	17.7	Yes	Exceeds background	2714	311	311	RC	No	Below risk screening criteria	LNWss-072M	04/01/2010
Iron	7439-89-6	23/ 23	15000	24000	20100	23100	No	Essential Nutrient	19010	2313	180000	RDA	No	Essential Nutrient	LNWss-029M	10/25/2004
Lead	7439-92-1	23/ 23	12.3	37.2	18.9	26.1	Yes	Exceeds background	--	--	400	RSL	No	Below risk screening criteria	LNWss-071M	04/01/2010
Magnesium	7439-95-4	23/ 23	1360	3700	2130	3030	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWss-074M	04/01/2010
Manganese	7439-96-5	23/ 23	292	1300	624	1450	No	Below background	1482	293	293	RC	No	Below background	LNWss-036M	10/26/2004
Mercury	7439-97-6	22/ 23	0.018	0.06	0.0393	0.036	Yes	Exceeds background	16.5	2.27	2.27	RC	No	Below risk screening criteria	LNWss-037M	11/01/2004
Nickel	7440-02-0	23/ 23	14	22.5	17.4	21.1	Yes	Exceeds background	1346	155	155	RC	No	Below risk screening criteria	LNWss-072M	04/01/2010
Potassium	7440-09-7	23/ 23	435	2300	770	927	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWss-042M	11/01/2004
Selenium	7782-49-2	17/ 23	0.4	0.94	0.72	1.4	No	Below background	--	--	39	RSL	No	Below background	LNWss-074M	04/01/2010
Silver	7440-22-4	2/ 23	0.13	0.18	0.303	0	Yes	Exceeds background	324	38.6	38.6	RC	No	Below risk screening criteria	LNWss-072M	04/01/2010
Sodium	7440-23-5	23/ 23	30	270	154	123	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWss-029M	10/25/2004
Thallium	7440-28-0	15/ 23	0.11	0.27	0.217	0	Yes	Exceeds background	4.76	0.612	0.612	RC	No	Below risk screening criteria	LNWss-031M	10/26/2004
Vanadium	7440-62-2	23/ 23	12.2	22	17.7	31.1	No	Below background	156	44.9	44.9	RC	No	Below background	LNWss-029M	10/25/2004
Zinc	7440-66-6	23/ 23	45.1	113	64.2	61.8	Yes	Exceeds background	19659	2321	2321	RC	No	Below risk screening criteria	LNWss-075M	03/31/2010
<i>Explosives</i>																
Nitrocellulose	9004-70-0	3/ 3	0.81	1.3	1.04	--	Yes	Detected organic	--	--	19000000	RSL	No	Below risk screening criteria	LNWss-034M	11/01/2004
Nitroglycerin	55-63-0	1/ 12	0.14	0.14	0.24	--	Yes	Detected organic	81.6	52.5	52.5	RC	No	Below risk screening criteria	LNWss-073M	04/01/2010
Nitroguanidine	556-88-7	1/ 3	0.11	0.11	0.12	--	Yes	Detected organic	--	--	630	RSL	No	Below risk screening criteria	LNWss-077M	04/01/2010
Tetryl	479-45-8	1/ 23	0.016	0.016	0.16	--	Yes	Detected organic	--	--	16	RSL	No	Below risk screening criteria	LNWss-079M	04/01/2010
<i>Semi-volatile Organic Compounds</i>																
2-Methylnaphthalene	91-57-6	3/ 14	0.01	0.02	0.0165	--	Yes	Detected organic	238	30.6	30.6	RC	No	Below risk screening criteria	LNWss-042M	11/01/2004
Acenaphthene	83-32-9	2/ 23	0.0068	0.057	0.0147	--	Yes	Detected organic	--	--	360	RSL	No	Below risk screening criteria	LNWss-079M	04/01/2010
Acenaphthylene ^e	208-96-8	2/ 23	0.015	0.018	0.0127	--	Yes	Detected organic	--	--	180	RSL	No	Below risk screening criteria	LNWss-070M	03/31/2010
Anthracene	120-12-7	3/ 23	0.0073	0.034	0.0143	--	Yes	Detected organic	--	--	1800	RSL	No	Below risk screening criteria	LNWss-070M	03/31/2010
Benz(a)anthracene	56-55-3	13/ 23	0.01	0.17	0.0285	--	Yes	Detected organic	0.221	0.65	0.221	RA	No	Below risk screening criteria	LNWss-070M	03/31/2010
Benzenemethanol	100-51-6	2/ 14	0.35	0.6	0.355	--	Yes	Detected organic	--	--	630	RSL	No	Below risk screening criteria	LNWss-031M	10/26/2004
Benzo(a)pyrene	50-32-8	15/ 23	0.011	0.16	0.0268	--	Yes	Detected organic	0.022	0.065	0.022	RA	Yes	Exceeds screening level	LNWss-070M	03/31/2010
Benzo(b)fluoranthene	205-99-2	18/ 23	0.0094	0.23	0.0378	--	Yes	Detected organic	0.221	0.65	0.221	RA	Yes	Exceeds screening level	LNWss-070M	03/31/2010
Benzo(ghi)perylene ^e	191-24-2	6/ 23	0.0093	0.11	0.0187	--	Yes	Detected organic	--	--	180	RSL	No	Below risk screening criteria	LNWss-070M	03/31/2010
Benzo(k)fluoranthene	207-08-9	9/ 23	0.0077	0.13	0.0229	--	Yes	Detected organic	2.21	6.5	2.21	RA	No	Below risk screening criteria	LNWss-070M	03/31/2010
Benzoic acid	65-85-0	1/ 2	0.24	0.24	0.323	--	Yes	Detected organic	--	--	25000	RSL	No	Below risk screening criteria	LNWss-033M	10/26/2004

Table G-1. SRC and COPC Screening for Shallow Surface Soil (0-1 ft bgs ISM Samples) at the Landfill North of Winklepeck Burning Grounds (continued)

Analyte (mg/kg)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b (HQ=0.1 or Risk=10 ⁻⁶)		Risk Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Date Collected at Max Detect
									RA	RC						
Bis(2-ethylhexyl)phthalate	117-81-7	4/ 14	0.023	0.12	0.0786	--	Yes	Detected organic	--	--	39	RSL	No	Below risk screening criteria	LNWss-031M	10/26/2004
Carbazole	86-74-8	1/ 14	0.041	0.041	0.0794	--	Yes	Detected organic	69.4	44.6	44.6	RC	No	Below risk screening criteria	LNWss-042M	11/01/2004
Chrysene	218-01-9	19/ 23	0.011	0.21	0.0331	--	Yes	Detected organic	22.1	65	22.1	RA	No	Below risk screening criteria	LNWss-070M	03/31/2010
Di-n-butyl phthalate	84-74-2	1/ 14	0.032	0.032	0.083	--	Yes	Detected organic	--	--	630	RSL	No	Below risk screening criteria	LNWss-077M	04/01/2010
Dibenz(a,h)anthracene	53-70-3	1/ 23	0.028	0.028	0.0133	--	Yes	Detected organic	0.022	0.065	0.022	RA	Yes	Exceeds screening level	LNWss-070M	03/31/2010
Dibenzofuran	132-64-9	2/ 14	0.0093	0.018	0.0415	--	Yes	Detected organic	119	15.3	15.3	RC	No	Below risk screening criteria	LNWss-042M	11/01/2004
Diethyl phthalate	84-66-2	1/ 14	0.022	0.022	0.0339	--	Yes	Detected organic	--	--	5100	RSL	No	Below risk screening criteria	LNWss-077M	04/01/2010
Fluoranthene	206-44-0	22/ 23	0.0088	0.43	0.0612	--	Yes	Detected organic	276	163	163	RC	No	Below risk screening criteria	LNWss-070M	03/31/2010
Fluorene	86-73-7	3/ 23	0.013	0.029	0.0137	--	Yes	Detected organic	737	243	243	RC	No	Below risk screening criteria	LNWss-079M	04/01/2010
Indeno(1,2,3-cd)pyrene	193-39-5	7/ 23	0.0081	0.11	0.019	--	Yes	Detected organic	0.221	0.65	0.221	RA	No	Below risk screening criteria	LNWss-070M	03/31/2010
Naphthalene	91-20-3	11/ 23	0.0072	0.029	0.0149	--	Yes	Detected organic	368	122	122	RC	No	Below risk screening criteria	LNWss-070M	03/31/2010
Phenanthrene ^e	85-01-8	13/ 23	0.009	0.26	0.0462	--	Yes	Detected organic	--	--	180	RSL	No	Below risk screening criteria	LNWss-042M	11/01/2004
Phenol	108-95-2	1/ 14	0.031	0.031	0.089	--	Yes	Detected organic	--	--	1900	RSL	No	Below risk screening criteria	LNWss-031M	10/26/2004
Pyrene	129-00-0	17/ 23	0.0073	0.29	0.0457	--	Yes	Detected organic	207	122	122	RC	No	Below risk screening criteria	LNWss-070M	03/31/2010
<i>Pesticides/PCBs</i>																
4,4'-DDE	72-55-9	1/ 3	0.0027	0.0027	0.00157	--	Yes	Detected organic	4.08	2.63	2.63	RC	No	Below risk screening criteria	LNWss-034M	11/01/2004
beta-BHC	319-85-7	1/ 3	0.0017	0.0017	0.00153	--	Yes	Detected organic	0.77	0.496	0.496	RC	No	Below risk screening criteria	LNWss-039M	11/01/2004
<i>Volatile Organic Compounds</i>																
Acetone	67-64-1	1/ 4	0.088	0.088	0.0295	--	Yes	Detected organic	--	--	6100	RSL	No	Below risk screening criteria	LNWss-039D	11/01/2004

^aBackground criteria for soil 0-1 ft bgs from final facility-wide background values for RVAAP, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).

^bFacility-Wide Cleanup Goals (FWCUG) for Resident Adult (RA) and Resident Child (RC) from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^cScreening Level Source:

RDA = Concentration associated with recommended daily allowance of essential nutrient

RA = FWCUG for Resident Adult

RC = FWCUG for Resident Child

RSL = United States Environmental Protection Agency (USEPA) Residential Regional Screening Level

^dFWCUG is the most conservative (smallest) of the FWCUGs for hexavalent and trivalent chromium.

^eNo reference dose or cancer potency factors are available for these PAHs, therefore, the RSL value for pyrene was used (NDEP 2006).

bgs = Below ground surface

CAS = Chemical Abstract Service

COPC = Chemical of Potential Concern

HQ = Hazard Quotient

PAH = Polycyclic Aromatic Hydrocarbon

PCB = Polychlorinated Biphenyl

ISM = Incremental Sampling Methodology

SRC = Site-related Contaminant

--=No value available

Bold = Chemical is a COPC

Table G-2. SRC and COPC Screening for Subsurface Soil (1-13 ft bgs Discrete Samples) at the Landfill North of Winklepeck Burning Grounds

Analyte (mg/kg)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b (HQ= 0.1 or Risk=1E-6)		Risk Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Date Collected at Max Detect
									RA	RC						
<i>Metals</i>																
Aluminum	7429-90-5	21/ 21	4900	12000	8910	19500	No	Below background	52923	7380	7380	RC	No	Below background	LNWsb-053	11/9/2004
Antimony	7440-36-0	2/ 20	0.47	1.3	0.694	0.96	Yes	Exceeds background	13.6	2.82	2.82	RC	No	Below risk screening criteria	LNWtr-003	8/6/1996
Arsenic	7440-38-2	21/ 21	3.7	18.5	12	19.8	No	Below background	0.425	0.524	0.425	RA	No	Below background	LNWtr-003	8/6/1996
Barium	7440-39-3	21/ 21	16	79	46.4	124	No	Below background	8966	1413	1413	RC	No	Below background	LNWsb-054	11/9/2004
Beryllium	7440-41-7	21/ 21	0.37	0.77	0.572	0.88	No	Below background	--	--	16	RSL	No	Below background	LNWsb-054	11/9/2004
Cadmium	7440-43-9	4/ 21	0.11	0.52	0.145	0	Yes	Exceeds background	22.3	6.41	6.41	RC	No	Below risk screening criteria	LNWtr-002	8/5/1996
Calcium	7440-70-2	21/ 21	490	17000	4700	35500	No	Essential Nutrient	--	--	1000000	RDA	No	Essential nutrient	LNWsb-063	11/10/2004
Chromium ^d	7440-47-3	21/ 21	8.2	18	13.2	27.2	No	Below background	90.4	19.9	19.9	RC	No	Below background	LNWsb-053	11/9/2004
Cobalt	7440-48-4	21/ 21	5.7	13	9.2	23.2	No	Below background	803	131	131	RC	No	Below background	LNWsb-053	11/9/2004
Copper	7440-50-8	21/ 21	13.1	31.9	20.5	32.3	No	Below background	2714	311	311	RC	No	Below background	LNWtr-003	8/6/1996
Cyanide	57-12-5	2/ 4	0.14	0.14	0.095	0	Yes	Exceeds background	--	--	0.27	RSL	No	Below risk screening criteria	LNWtr-002	8/5/1996
Iron	7439-89-6	21/ 21	14000	28000	22000	35200	No	Essential Nutrient	19010	2313	180000	RDA	No	Essential nutrient	LNWsb-057	11/9/2004
Lead	7439-92-1	21/ 21	9.7	28.4	12.7	19.1	Yes	Exceeds background	--	--	400	RSL	No	Below risk screening criteria	LNWtr-002	8/5/1996
Magnesium	7439-95-4	21/ 21	1580	5700	3270	8790	No	Essential Nutrient	--	--	1000000	RDA	No	Essential nutrient	LNWsb-055	11/9/2004
Manganese	7439-96-5	21/ 21	120	520	325	3030	No	Below background	1482	293	293	RC	No	Below background	LNWsb-063	11/10/2004
Mercury	7439-97-6	10/ 21	0.01	0.04	0.0181	0.044	No	Below background	16.5	2.27	2.27	RC	No	Below background	LNWsb-066	11/10/2004
Nickel	7440-02-0	21/ 21	11.8	32	21	60.7	No	Below background	1346	155	155	RC	No	Below background	LNWsb-054	11/9/2004
Potassium	7440-09-7	21/ 21	597	1900	1190	3350	No	Essential Nutrient	--	--	1000000	RDA	No	Essential nutrient	LNWsb-063	11/10/2004
Selenium	7782-49-2	18/ 21	0.45	1.1	0.631	1.5	No	Below background	--	--	39	RSL	No	Below background	LNWtr-002	8/5/1996
Silver	7440-22-4	1/ 21	0.22	0.22	0.472	0	No	<5% Detected	324	38.6	38.6	RC	No	<5% detected	LNWtr-002	8/5/1996
Sodium	7440-23-5	16/ 21	148	410	262	145	No	Essential Nutrient			1000000	RDA	No	Essential nutrient	LNWsb-053	11/9/2004
Thallium	7440-28-0	8/ 21	0.21	1.7	0.511	0.91	Yes	Exceeds background	4.76	0.612	0.612	RC	Yes	Exceeds screening level	LNWtr-002	8/5/1996
Vanadium	7440-62-2	21/ 21	9.9	18	15	37.6	No	Below background	156	44.9	44.9	RC	No	Below background	LNWsb-053	11/9/2004
Zinc	7440-66-6	21/ 21	40	212	69.7	93.3	Yes	Exceeds background	19659	2321	2321	RC	No	Below risk screening criteria	LNWtr-002	8/5/1996
<i>SVOCs</i>																
1,4-Dichlorobenzene	106-46-7	1/ 21	0.13	0.13	0.11	None	No	<5% Detected	--	--	2.6	RSL	No	<5% detected	LNWtr-003	8/6/1996
Benzo(b)fluoranthene	205-99-2	1/ 21	0.017	0.017	0.0484	None	No	<5% Detected	0.221	0.65	0.221	RA	No	<5% detected	LNWsb-065	11/10/2004
Bis(2-ethylhexyl)phthalate	117-81-7	3/ 21	0.049	0.1	0.0979	None	Yes	Detected organic	--	--	39	RSL	No	Below risk screening criteria	LNWtr-003	8/6/1996
Chrysene	218-01-9	1/ 21	0.014	0.014	0.0482	None	No	<5% Detected	22.1	65	22.1	RA	No	<5% detected	LNWsb-065	11/10/2004
Di-n-butyl phthalate	84-74-2	1/ 21	0.036	0.036	0.105	None	No	<5% Detected	--	--	630	RSL	No	<5% detected	LNWtr-004	8/6/1996
Fluoranthene	206-44-0	1/ 21	0.022	0.022	0.0486	None	No	<5% Detected	276	163	163	RC	No	<5% detected	LNWsb-065	11/10/2004
<i>Pesticides/PCBs</i>																
4,4'-DDD	72-54-8	1/ 4	0.062	0.062	0.0165	None	Yes	Detected organic	--	--	2.3	RSL	No	Below risk screening criteria	LNWtr-002	8/5/1996
4,4'-DDE	72-55-9	2/ 4	0.0034	0.019	0.00624	None	Yes	Detected organic	4.08	2.63	2.63	RC	No	Below risk screening criteria	LNWtr-002	8/5/1996
4,4'-DDT	50-29-3	3/ 4	0.0029	0.037	0.0178	None	Yes	Detected organic	--	--	1.9	RSL	No	Below risk screening criteria	LNWtr-002	8/5/1996
Endrin aldehyde	7421-93-4	1/ 4	0.0027	0.0027	0.00165	None	Yes	Detected organic	--	--	1.9	RSL	No	Below risk screening criteria	LNWtr-003	8/6/1996
Heptachlor	76-44-8	1/ 4	0.0016	0.0016	0.0009	None	Yes	Detected organic	0.308	0.198	0.198	RC	No	Below risk screening criteria	LNWtr-003	8/6/1996
PCB-1254	11097-69-1	1/ 4	0.087	0.087	0.0479	None	Yes	Detected organic	0.203	0.12	0.12	RC	No	Below risk screening criteria	LNWtr-003	8/6/1996

Table G-2. SRC and COPC Screening for Subsurface Soil (1-13 ft bgs Discrete Samples) at the Landfill North of Winklepeck Burning Grounds (continued)

Analyte (mg/kg)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b (HQ= 0.1 or Risk=1E-6)		Risk Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Date Collected at Max Detect
									RA	RC						
<i>VOCs</i>																
Chlorobenzene	108-90-7	1/ 4	0.15	0.15	0.0394	None	Yes	Detected organic	--	--	28	RSL	No	Below risk screening criteria	LNWtr-003	8/6/1996
Methylene chloride	75-09-2	3/ 4	0.004	0.019	0.00763	None	Yes	Detected organic	--	--	35	RSL	No	Below risk screening criteria	LNWtr-003	8/6/1996

^aBackground criteria for soil >1 ft bgs from final facility-wide background values for RVAAP, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).

^bFacility-Wide Cleanup Goals (FWCUGs) for Resident Adult (RA) and Resident Child (RC) from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^cScreening Level Source:

RDA = Concentration associated with recommended daily allowance of essential nutrient

RA = FWCUG for Resident Adult

RC = FWCUG for Resident Child

RSL = USEPA Residential Regional Screening Level

^dFWCUG is the most conservative (smallest) of the FWCUGs for hexavalent and trivalent chromium.

bgs = Below ground surface

CAS = Chemical Abstract Service

COPC = Chemical of Potential Concern

HQ = Hazard Quotient

SRC = Site Related Chemical

USEPA = United States Environmental Protection Agency

Bold = Chemical is a COPC

Table G-3. SRC and COPC Screening for Sediment at the Landfill North of Winklepeck Burning Grounds East Tributary Exposure Unit

Analyte (mg/kg)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b (HQ=0.1 or Risk=10 ⁻⁶)		Risk Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Date Collected at Max Detect
									RA	RC						
Discrete Samples																
<i>Inorganic Chemicals</i>																
Aluminum	7429-90-5	3/3	5100	11500	8660	13900	No	Below background	52923	7380	7380	RC	No	Below background	LNWsd-083	03/30/10
Antimony	7440-36-0	2/3	0.09	0.24	0.21	0	Yes	Exceeds background	13.6	2.82	2.82	RC	No	Below risk screening criteria	LNWsd-084	03/30/10
Arsenic	7440-38-2	3/3	7.8	12.9	10.2	19.5	No	Below background	0.425	0.524	0.425	RA	No	Below background	LNWsd-084	03/30/10
Barium	7440-39-3	3/3	35.9	93.1	72.3	123	No	Below background	8966	1413	1413	RC	No	Below background	LNWsd-084	03/30/10
Beryllium	7440-41-7	3/3	0.5	0.62	0.57	0.38	Yes	Exceeds background	--	--	16	RSL	No	Below risk screening criteria	LNWsd-083	03/30/10
Cadmium	7440-43-9	3/3	0.11	0.55	0.32	0	Yes	Exceeds background	22.3	6.41	6.41	RC	No	Below risk screening criteria	LNWsd-084	03/30/10
Calcium	7440-70-2	3/3	916	1990	1370	5510	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-084	03/30/10
Chromium ^d	7440-47-3	3/3	10.4	14.6	13	18.1	No	Below background	90.4	19.9	19.9	RC	No	Below background	LNWsd-083	03/30/10
Cobalt	7440-48-4	3/3	7	10.2	8.5	9.1	Yes	Exceeds background	--	--	2.3	RSL	Yes	Exceeds screening level	LNWsd-084	03/30/10
Copper	7440-50-8	3/3	11.4	20.2	15.5	27.6	No	Below background	2714	311	311	RC	No	Below background	LNWsd-084	03/30/10
Iron	7439-89-6	3/3	18700	29400	23400	28200	No	Essential Nutrient	19010	2313	180000	RDA	No	Essential Nutrient	LNWsd-084	03/30/10
Lead	7439-92-1	3/3	9.4	30	18.6	27.4	Yes	Exceeds background	--	--	400	RSL	No	Below risk screening criteria	LNWsd-084	03/30/10
Magnesium	7439-95-4	3/3	1560	2670	2230	2760	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-083	03/30/10
Manganese	7439-96-5	3/3	473	1080	748	1950	No	Below background	1482	293	293	RC	No	Below background	LNWsd-084	03/30/10
Nickel	7440-02-0	3/3	19.3	22.1	20.7	17.7	Yes	Exceeds background	1346	155	155	RC	No	Below risk screening criteria	LNWsd-085	03/30/10
Potassium	7440-09-7	3/3	903	1010	960	1950	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-083	03/30/10
Selenium	7782-49-2	3/3	0.89	1.4	1.2	1.7	No	Below background	--	--	39	RSL	No	Below background	LNWsd-084	03/30/10
Silver	7440-22-4	2/3	0.038	0.041	0.029	0	Yes	Exceeds background	324	38.6	38.6	RC	No	Below risk screening criteria	LNWsd-084	03/30/10
Sodium	7440-23-5	3/3	45.6	54.4	49.4	112	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-084	03/30/10
Thallium	7440-28-0	3/3	0.096	0.19	0.15	0.89	No	Below background	4.76	0.612	0.612	RC	No	Below background	LNWsd-084	03/30/10
Vanadium	7440-62-2	3/3	8.2	19.7	15.2	26.1	No	Below background	156	44.9	44.9	RC	No	Below background	LNWsd-083	03/30/10
Zinc	7440-66-6	3/3	52	111	81.4	532	No	Below background	19659	2321	2321	RC	No	Below background	LNWsd-084	03/30/10
<i>Semi-volatile Organic Compounds</i>																
2-Methylnaphthalene	91-57-6	1/3	0.15	0.15	0.24	--	Yes	Detected organic	--	--	24	RSL	No	Below risk screening criteria	LNWsd-085	03/30/10
Acenaphthylene ^e	208-96-8	1/3	0.015	0.015	0.032	--	Yes	Detected organic	--	--	180	RSL	No	Below risk screening criteria	LNWsd-083	03/30/10
Benz(a)anthracene	56-55-3	2/3	0.014	0.037	0.027	--	Yes	Detected organic	0.221	0.65	0.221	RA	No	Below risk screening criteria	LNWsd-083	03/30/10
Benzo(a)pyrene	50-32-8	3/3	0.014	0.044	0.024	--	Yes	Detected organic	0.022	0.065	0.022	RA	Yes	Exceeds screening level	LNWsd-083	03/30/10
Benzo(b)fluoranthene	205-99-2	2/3	0.039	0.079	0.056	--	Yes	Detected organic	0.221	0.65	0.221	RA	No	Below risk screening criteria	LNWsd-083	03/30/10
Benzo(ghi)perylene ^e	191-24-2	2/3	0.03	0.03	0.04	--	Yes	Detected organic	--	--	180	RSL	No	Below risk screening criteria	LNWsd-083	03/30/10
Benzo(k)fluoranthene	207-08-9	1/3	0.038	0.038	0.040	--	Yes	Detected organic	2.21	6.5	2.21	RA	No	Below risk screening criteria	LNWsd-083	03/30/10
Bis(2-ethylhexyl)phthalate	117-81-7	1/3	0.42	0.42	0.32	--	Yes	Detected organic	--	--	39	RSL	No	Below risk screening criteria	LNWsd-083	03/30/10
Chrysene	218-01-9	2/3	0.016	0.049	0.032	--	Yes	Detected organic	--	--	16	RSL	No	Below risk screening criteria	LNWsd-083	03/30/10
Fluoranthene	206-44-0	3/3	0.017	0.066	0.036	--	Yes	Detected organic	--	--	240	RSL	No	Below risk screening criteria	LNWsd-083	03/30/10
Fluorene	86-73-7	1/3	0.016	0.016	0.034	--	Yes	Detected organic	--	--	240	RSL	No	Below risk screening criteria	LNWsd-085	03/30/10
Indeno(1,2,3-cd)pyrene	193-39-5	1/3	0.029	0.029	0.037	--	Yes	Detected organic	0.221	0.65	0.221	RA	No	Below risk screening criteria	LNWsd-083	03/30/10
Naphthalene	91-20-3	1/3	0.065	0.065	0.05	--	Yes	Detected organic	--	--	3.8	RSL	No	Below risk screening criteria	LNWsd-085	03/30/10
Phenanthrene ^e	85-01-8	2/3	0.016	0.081	0.049	--	Yes	Detected organic	--	--	180	RSL	No	Below risk screening criteria	LNWsd-085	03/30/10
Pyrene	129-00-0	3/3	0.019	0.052	0.033	--	Yes	Detected organic	--	--	180	RSL	No	Below risk screening criteria	LNWsd-083	03/30/10
<i>Volatile Organic Compounds</i>																
2-Butanone	78-93-3	1/1	0.0054	0.0054	0.0054	--	Yes	Detected organic	--	--	2700	RSL	No	Below risk screening criteria	LNWsd-083	03/30/10

Table G-3. SRC and COPC Screening for Sediment at the Landfill North of Winklepeck Burning Grounds East Tributary Exposure Unit

Analyte (mg/kg)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b		Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Collected at Max Detect
									RA	RC						
ISM Samples																
<i>Inorganic Chemicals</i>																
Aluminum	7429-90-5	3/3	7400	9900	8800	13900	No	Below background	52923	7380	7380	RC	No	Below background	LNWsd-043M	11/03/04
Arsenic	7440-38-2	3/3	6.4	12	8.7	19.5	No	Below background	0.425	0.524	0.425	RA	No	Below background	LNWsd-045M	11/02/04
Barium	7440-39-3	3/3	62	81	74.3	123	No	Below background	8966	1413	1413	RC	No	Below background	LNWsd-045M	11/02/04
Beryllium	7440-41-7	3/3	0.58	0.7	0.65	0.38	Yes	Exceeds background	--	--	16	RSL	No	Below risk screening criteria	LNWsd-043M	11/03/04
Cadmium	7440-43-9	1/3	0.34	0.34	0.29	0	Yes	Exceeds background	22.3	6.41	6.41	RC	No	Below risk screening criteria	LNWsd-044M	11/02/04
Calcium	7440-70-2	3/3	1900	2100	1970	5510	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-043M	11/03/04
Chromium	7440-47-3	3/3	10	13	11.7	18.1	No	Below background	90.4	19.9	19.9	RC	No	Below background	LNWsd-043M	11/03/04
Cobalt	7440-48-4	3/3	6.9	8.6	8	9.1	No	Below background	--	--	2.3	RSL	No	Below background	LNWsd-043M	11/03/04
Copper	7440-50-8	3/3	12	18	15	27.6	No	Below background	2714	311	311	RC	No	Below background	LNWsd-045M	11/02/04
Iron	7439-89-6	3/3	16000	22000	19300	28200	No	Essential Nutrient	19010	2313	180000	RDA	No	Essential Nutrient	LNWsd-045M	11/02/04
Lead	7439-92-1	3/3	15	16	15.3	27.4	No	Below background	--	--	400	RSL	No	Below background	LNWsd-045M	11/02/04
Magnesium	7439-95-4	3/3	1700	2400	2100	2760	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-043M	11/03/04
Manganese	7439-96-5	3/3	470	710	593	1950	No	Below background	1482	293	293	RC	No	Below background	LNWsd-045M	11/02/04
Mercury	7439-97-6	3/3	0.04	0.06	0.047	0.059	Yes	Exceeds background	16.5	2.27	2.27	RC	No	Below risk screening criteria	LNWsd-045M	11/02/04
Nickel	7440-02-0	3/3	14	19	17	17.7	Yes	Exceeds background	1346	155	155	RC	No	Below risk screening criteria	LNWsd-043M	11/03/04
Potassium	7440-09-7	3/3	930	1300	1140	1950	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-043M	11/03/04
Sodium	7440-23-5	3/3	240	280	267	112	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-043M	11/03/04
Vanadium	7440-62-2	3/3	15	18	16.7	26.1	No	Below background	156	44.9	44.9	RC	No	Below background	LNWsd-043M	11/03/04
Zinc	7440-66-6	3/3	71	89	81.7	532	No	Below background	19659	2321	2321	RC	No	Below background	LNWsd-045M	11/02/04
<i>Explosives</i>																
Nitrocellulose	9004-70-0	1/1	1.4	1.4	1.4	--	Yes	Detected organic	--	--	19000000	RSL	No	Below risk screening criteria	LNWsd-044M	11/02/04

Table G-3. SRC and COPC Screening for Sediment at the Landfill North of Winklepeck Burning Grounds East Tributary Exposure Unit (continued)

Analyte (mg/kg)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b		Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Collected at Max Detect
									RA	RC						
<i>Semi-volatile Organic Compounds</i>																
Benz(a)anthracene	56-55-3	3/3	0.027	0.059	0.040	--	Yes	Detected organic	0.221	0.65	0.221	RA	No	Below risk screening criteria	LNWsd-044M	11/02/04
Benzo(a)pyrene	50-32-8	3/3	0.025	0.064	0.04	--	Yes	Detected organic	0.022	0.065	0.022	RA	Yes	Exceeds screening level	LNWsd-044M	11/02/04
Benzo(b)fluoranthene	205-99-2	3/3	0.037	0.091	0.057	--	Yes	Detected organic	0.221	0.65	0.221	RA	No	Below risk screening criteria	LNWsd-044M	11/02/04
Benzo(ghi)perylene ^c	191-24-2	1/3	0.043	0.043	0.039	--	Yes	Detected organic	--	--	180	RSL	No	Below risk screening criteria	LNWsd-044M	11/02/04
Benzo(k)fluoranthene	207-08-9	2/3	0.025	0.038	0.034	--	Yes	Detected organic	2.21	6.5	2.21	RA	No	Below risk screening criteria	LNWsd-044M	11/02/04
Chrysene	218-01-9	3/3	0.033	0.079	0.051	--	Yes	Detected organic	--	--	16	RSL	No	Below risk screening criteria	LNWsd-044M	11/02/04
Fluoranthene	206-44-0	3/3	0.041	0.068	0.051	--	Yes	Detected organic	--	--	240	RSL	No	Below risk screening criteria	LNWsd-044M	11/02/04
Pyrene	129-00-0	3/3	0.043	0.071	0.052	--	Yes	Detected organic	--	--	180	RSL	No	Below risk screening criteria	LNWsd-044M	11/02/04

^aBackground criteria for sediment from final facility-wide background values for RVAAP, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).

^bFacility-Wide Cleanup Goals (FWCUG) for Resident Adult (RA) and Resident Child (RC) from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^cScreening Level Source:

RDA = Concentration associated with recommended daily allowance of essential nutrient

RA = FWCUG for Resident Adult

RC = FWCUG for Resident Child

RSL = United States Environmental Protection Agency (USEPA) Residential Regional Screening Level

^dFWCUG is the most conservative (smallest) of the FWCUGs for hexavalent and trivalent chromium.

^eNo reference dose or cancer potency factors are available for these PAHs, therefore, the RSL value for pyrene was used (NDEP 2006).

CAS = Chemical Abstract Service

COPC = Chemical of Potential Concern

HQ = Hazard Quotient

PAH = Polycyclic Aromatic Hydrocarbon

ISM = Incremental Sampling Methodology

SRC = Site-related Contaminant

--=No value available

Bold = Chemical is a COPC

Table G-4. SRC and COPC Screening for Sediment at the Landfill North of Winklepeck Burning Grounds South Tributary Exposure Unit

Analyte (mg/kg)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b (HQ=0.1 or Risk=10 ⁻⁶)		Risk Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Date Collected at Max Detect
									RA	RC						
Discrete Samples																
<i>Inorganic Chemicals</i>																
Aluminum	7429-90-5	1/1	12000	12000	12000	13900	No	Below background	52923	7380	7380	RC	No	Below background	LNWsd-086	03/31/10
Antimony	7440-36-0	1/1	0.2	0.2	0.2	0	Yes	Exceeds background	13.6	2.82	2.82	RC	No	Below risk screening criteria	LNWsd-086	03/31/10
Arsenic	7440-38-2	1/1	18.6	18.6	18.6	19.5	No	Below background	0.425	0.524	0.425	RA	No	Below background	LNWsd-086	03/31/10
Barium	7440-39-3	1/1	76.7	76.7	76.7	123	No	Below background	8966	1413	1413	RC	No	Below background	LNWsd-086	03/31/10
Beryllium	7440-41-7	1/1	1	1	1	0.38	Yes	Exceeds background	--	--	16	RSL	No	Below risk screening criteria	LNWsd-086	03/31/10
Cadmium	7440-43-9	1/1	0.43	0.43	0.43	0	Yes	Exceeds background	22.3	6.41	6.41	RC	No	Below risk screening criteria	LNWsd-086	03/31/10
Calcium	7440-70-2	1/1	1270	1270	1270	5510	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-086	03/31/10
Chromium ^d	7440-47-3	1/1	15.4	15.4	15.4	18.1	No	Below background	90.4	19.9	19.9	RC	No	Below background	LNWsd-086	03/31/10
Cobalt	7440-48-4	1/1	10	10	10	9.1	Yes	Exceeds background	--	--	2.3	RSL	Yes	Exceeds screening level	LNWsd-086	03/31/10
Copper	7440-50-8	1/1	14.7	14.7	14.7	27.6	No	Below background	2714	311	311	RC	No	Below background	LNWsd-086	03/31/10
Iron	7439-89-6	1/1	80200	80200	80200	28200	No	Essential Nutrient	19010	2313	180000	RDA	No	Essential Nutrient	LNWsd-086	03/31/10
Lead	7439-92-1	1/1	24.1	24.1	24.1	27.4	No	Below background	--	--	400	RSL	No	Below background	LNWsd-086	03/31/10
Magnesium	7439-95-4	1/1	2300	2300	2300	2760	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-086	03/31/10
Manganese	7439-96-5	1/1	738	738	738	1950	No	Below background	1482	293	293	RC	No	Below background	LNWsd-086	03/31/10
Mercury	7439-97-6	1/1	0.047	0.047	0.047	0.059	No	Below background	16.5	2.27	2.27	RC	No	Below background	LNWsd-086	03/31/10
Nickel	7440-02-0	1/1	17.6	17.6	17.6	17.7	No	Below background	1346	155	155	RC	No	Below background	LNWsd-086	03/31/10
Potassium	7440-09-7	1/1	885	885	885	1950	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-086	03/31/10
Selenium	7782-49-2	1/1	1.2	1.2	1.2	1.7	No	Below background	--	--	39	RSL	No	Below background	LNWsd-086	03/31/10
Silver	7440-22-4	1/1	0.04	0.04	0.04	0	Yes	Exceeds background	324	38.6	38.6	RC	No	Below risk screening criteria	LNWsd-086	03/31/10
Sodium	7440-23-5	1/1	45.7	45.7	45.7	112	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-086	03/31/10
Thallium	7440-28-0	1/1	0.19	0.19	0.19	0.89	No	Below background	4.76	0.612	0.612	RC	No	Below background	LNWsd-086	03/31/10
Vanadium	7440-62-2	1/1	29.9	29.9	29.9	26.1	Yes	Exceeds background	156	44.9	44.9	RC	No	Below risk screening criteria	LNWsd-086	03/31/10
Zinc	7440-66-6	1/1	81.8	81.8	81.8	532	No	Below background	19659	2321	2321	RC	No	Below background	LNWsd-086	03/31/10
<i>Explosives</i>																
1,3,5-Trinitrobenzene	99-35-4	1/1	0.023	0.023	0.023	--	Yes	Detected organic	--	--	220	RSL	No	Below risk screening criteria	LNWsd-086	03/31/10
<i>Semi-volatile Organic Compounds</i>																
Fluoranthene	206-44-0	1/1	0.012	0.012	0.012	--	Yes	Detected organic	--	--	240	RSL	No	Below risk screening criteria	LNWsd-086	03/31/10

Table G-4. SRC and COPC Screening for Sediment at the Landfill North of Winklepeck Burning Grounds South Tributary Exposure Unit (continued)

Analyte (mg/kg)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b (HQ=0.1 or Risk=10 ⁻⁶)		Risk Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Date Collected at Max Detect
									RA	RC						
ISM Samples																
<i>Inorganic Chemicals</i>																
Aluminum	7429-90-5	1/1	10000	10000	10000	13900	No	Below background	52923	7380	7380	RC	No	Below background	LNWsd-046M	11/02/04
Arsenic	7440-38-2	1/1	7.8	7.8	7.8	19.5	No	Below background	0.425	0.524	0.425	RA	No	Below background	LNWsd-046M	11/02/04
Barium	7440-39-3	1/1	110	110	110	123	No	Below background	8966	1413	1413	RC	No	Below background	LNWsd-046M	11/02/04
Beryllium	7440-41-7	1/1	0.73	0.73	0.73	0.38	Yes	Exceeds background	--	--	16	RSL	No	Below risk screening criteria	LNWsd-046M	11/02/04
Calcium	7440-70-2	1/1	1800	1800	1800	5510	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-046M	11/02/04
Chromium	7440-47-3	1/1	13	13	13	18.1	No	Below background	90.4	19.9	19.9	RC	No	Below background	LNWsd-046M	11/02/04
Cobalt	7440-48-4	1/1	7.5	7.5	7.5	9.1	No	Below background	--	--	2.3	RSL	No	Below background	LNWsd-046M	11/02/04
Copper	7440-50-8	1/1	16	16	16	27.6	No	Below background	2714	311	311	RC	No	Below background	LNWsd-046M	11/02/04
Iron	7439-89-6	1/1	19000	19000	19000	28200	No	Essential Nutrient	19010	2313	180000	RDA	No	Essential Nutrient	LNWsd-046M	11/02/04
Lead	7439-92-1	1/1	19	19	19	27.4	No	Below background	--	--	400	RSL	No	Below background	LNWsd-046M	11/02/04
Magnesium	7439-95-4	1/1	2200	2200	2200	2760	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-046M	11/02/04
Manganese	7439-96-5	1/1	700	700	700	1950	No	Below background	1482	293	293	RC	No	Below background	LNWsd-046M	11/02/04
Mercury	7439-97-6	1/1	0.07	0.07	0.07	0.059	Yes	Exceeds background	16.5	2.27	2.27	RC	No	Below risk screening criteria	LNWsd-046M	11/02/04
Nickel	7440-02-0	1/1	17	17	17	17.7	No	Below background	1346	155	155	RC	No	Below background	LNWsd-046M	11/02/04
Potassium	7440-09-7	1/1	810	810	810	1950	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-046M	11/02/04
Sodium	7440-23-5	1/1	280	280	280	112	No	Essential Nutrient	--	--	1000000	RDA	No	Essential Nutrient	LNWsd-046M	11/02/04
Vanadium	7440-62-2	1/1	18	18	18	26.1	No	Below background	156	44.9	44.9	RC	No	Below background	LNWsd-046M	11/02/04
Zinc	7440-66-6	1/1	75	75	75	532	No	Below background	19659	2321	2321	RC	No	Below background	LNWsd-046M	11/02/04

^aBackground criteria for sediment from final facility-wide background values for RVAAP, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).

^bFacility-Wide Cleanup Goals (FWCUG) for Resident Adult (RA) and Resident Child (RC) from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^cScreening Level Source:

RDA = Concentration associated with recommended daily allowance of essential nutrient

RA = FWCUG for Resident Adult

RC = FWCUG for Resident Child

RSL = United States Environmental Protection Agency (USEPA) Residential Regional Screening Level

^dFWCUG is the most conservative (smallest) of the FWCUGs for hexavalent and trivalent chromium.

CAS = Chemical Abstract Service

COPC = Chemical of Potential Concern

HQ = Hazard Quotient

PAH = Polycyclic Aromatic Hydrocarbon

ISM = Incremental Sampling Methodology

SRC = Site-related Contaminant

--=No value available

Bold = Chemical is a COPC

Table G-5. SRC and COPC Screening for Surface Water at the Landfill North of Winklepeck Burning Grounds East Tributary and South Tributary Exposure Units

Analyte (mg/L)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b (HQ=0.1 or Risk=10 ⁻⁶)		Risk Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Date Collected at Max Detect
									RA	RC						
East Tributary																
<i>Inorganic Chemicals</i>																
Aluminum	7429-90-5	3/ 3	0.539	0.69	0.60	3.37	No	Below background	63.895	14.827	14.827	RC	No	Below background	LNWsw-085	03/30/10
Antimony	7440-36-0	1/ 3	0.00023	0.00023	0.0017	0	Yes	Exceeds background	0.0171	0.00491	0.00491	RC	No	Below risk screening criteria	LNWsw-084	03/30/10
Arsenic	7440-38-2	3/ 3	0.00081	0.001	0.00091	0.0032	No	Below background	0.0011	0.0012	0.0011	RA	No	Below background	LNWsw-085	03/30/10
Barium	7440-39-3	3/ 3	0.0159	0.0174	0.016	0.0475	No	Below background	12.131	2.901	2.901	RC	No	Below background	LNWsw-083	03/30/10
Cadmium	7440-43-9	1/ 3	0.000043	0.000043	0.00068	0	Yes	Exceeds background	0.0151	0.00505	0.00505	RC	No	Below risk screening criteria	LNWsw-084	03/30/10
Calcium	7440-70-2	3/ 3	16.1	16.5	16.3	41.4	No	Essential Nutrient	--	--	500	RDA	No	Essential Nutrient	LNWsw-083	03/30/10
Chromium ^d	7440-47-3	2/ 3	0.00067	0.0031	0.0021	0	Yes	Exceeds background	0.0903	0.0303	0.0303	RC	No	Below risk screening criteria	LNWsw-085	03/30/10
Cobalt	7440-48-4	3/ 3	0.00019	0.00025	0.00022	0	Yes	Exceeds background	--	--	0.0006	RSL	No	Below risk screening criteria	LNWsw-085	03/30/10
Copper	7440-50-8	2/ 3	0.0014	0.0015	0.0018	0.0079	No	Below background	2.788	0.614	0.614	RC	No	Below background	LNWsw-084	03/30/10
Iron	7439-89-6	3/ 3	0.899	1.34	1.1	2.56	No	Essential Nutrient	20	4.527	18	RDA	No	Essential Nutrient	LNWsw-085	03/30/10
Lead	7439-92-1	3/ 3	0.00042	0.00059	0.00051	0	Yes	Exceeds background	--	--	0.015	RSL	No	Below risk screening criteria	LNWsw-085	03/30/10
Magnesium	7439-95-4	3/ 3	3.81	4.06	3.9	10.8	No	Essential Nutrient	--	--	200	RDA	No	Essential Nutrient	LNWsw-083	03/30/10
Manganese	7439-96-5	3/ 3	0.0997	0.12	0.11	0.391	No	Below background	2.476	0.633	0.633	RC	No	Below background	LNWsw-083	03/30/10
Nickel	7440-02-0	3/ 3	0.0011	0.002	0.0014	0	Yes	Exceeds background	1.445	0.312	0.312	RC	No	Below risk screening criteria	LNWsw-085	03/30/10
Potassium	7440-09-7	3/ 3	1.14	1.2	1.2	3.17	No	Essential Nutrient	--	--	1750	RDA	No	Essential Nutrient	LNWsw-085	03/30/10
Silver	7440-22-4	1/ 3	0.000028	0.000028	0.0017	0	Yes	Exceeds background	0.348	0.0768	0.0768	RC	No	Below risk screening criteria	LNWsw-084	03/30/10
Sodium	7440-23-5	3/ 3	1.6	1.65	1.6	21.3	No	Essential Nutrient	--	--	1200	RDA	No	Essential Nutrient	LNWsw-083	03/30/10
Thallium	7440-28-0	1/ 3	0.00038	0.00038	0.00079	0	Yes	Exceeds background	0.00576	0.00124	0.00124	RC	No	Below risk screening criteria	LNWsw-084	03/30/10
Vanadium	7440-62-2	3/ 3	0.00086	0.0012	0.0010	0	Yes	Exceeds background	0.211	0.0706	0.0706	RC	No	Below risk screening criteria	LNWsw-085	03/30/10
<i>Semi-volatile Organic Compounds</i>																
Bis(2-ethylhexyl)phthalate	117-81-7	2/ 3	0.0009	0.005	0.00363	--	Yes	Detected organic	0.00349	0.00927	0.00349	RA	Yes	Exceeds screening level	LNWsw-085	03/30/10
<i>Volatile Organic Compounds</i>																
Acetone	67-64-1	3/ 3	0.0016	0.0027	0.002	--	Yes	Detected organic	--	--	1.4	RSL	No	Below risk screening criteria	LNWsw-083	03/30/10

Table G-5. SRC and COPC Screening for Surface Water at the Landfill North of Winklepeck Burning Grounds East Tributary and South Tributary Exposure Units (continued)

Analyte (mg/L)	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Background Criteria ^a	SRC (yes/no)	SRC Justification	Screening FWCUG ^b (HQ=0.1 or Risk=10 ⁻⁶)		Risk Screening Level	Screening Level Source ^c	COPC (yes/no)	COPC Justification	Station at Max Detect	Date Collected at Max Detect
									RA	RC						
South Tributary																
<i>Inorganic Chemicals</i>																
Aluminum	7429-90-5	1/ 1	0.62	0.62	0.62	3.37	No	Below background	63.895	14.827	14.827	RC	No	Below background	LNWsw-086	03/31/10
Arsenic	7440-38-2	1/ 1	0.0019	0.0019	0.0019	0.0032	No	Below background	0.0011	0.0012	0.0011	RA	No	Below background	LNWsw-086	03/31/10
Barium	7440-39-3	1/ 1	0.032	0.032	0.032	0.0475	No	Below background	12.131	2.901	2.901	RC	No	Below background	LNWsw-086	03/31/10
Cadmium	7440-43-9	1/ 1	0.000057	0.000057	0.000057	0	Yes	Exceeds background	0.0151	0.00505	0.00505	RC	No	Below risk screening criteria	LNWsw-086	03/31/10
Calcium	7440-70-2	1/ 1	23	23	23	41.4	No	Essential Nutrient	--	--	500	RDA	No	Essential Nutrient	LNWsw-086	03/31/10
Chromium	7440-47-3	1/ 1	0.00077	0.00077	0.00077	0	Yes	Exceeds background	0.0903	0.0303	0.0303	RC	No	Below risk screening criteria	LNWsw-086	03/31/10
Cobalt	7440-48-4	1/ 1	0.0013	0.0013	0.0013	0	Yes	Exceeds background	--	--	0.0006	RSL	Yes	Exceeds screening level	LNWsw-086	03/31/10
Copper	7440-50-8	1/ 1	0.0014	0.0014	0.0014	0.0079	No	Below background	2.788	0.614	0.614	RC	No	Below background	LNWsw-086	03/31/10
Iron	7439-89-6	1/ 1	6.1	6.1	6.1	2.56	No	Essential Nutrient	20	4.527	18	RDA	No	Essential Nutrient	LNWsw-086	03/31/10
Lead	7439-92-1	1/ 1	0.001	0.001	0.001	0	Yes	Exceeds background	--	--	0.015	RSL	No	Below risk screening criteria	LNWsw-086	03/31/10
Magnesium	7439-95-4	1/ 1	5.9	5.9	5.9	10.8	No	Essential Nutrient	--	--	200	RDA	No	Essential Nutrient	LNWsw-086	03/31/10
Manganese	7439-96-5	1/ 1	0.77	0.77	0.77	0.391	Yes	Exceeds background	2.476	0.633	0.633	RC	Yes	Exceeds screening level	LNWsw-086	03/31/10
Nickel	7440-02-0	1/ 1	0.0011	0.0011	0.0011	0	Yes	Exceeds background	1.445	0.312	0.312	RC	No	Below risk screening criteria	LNWsw-086	03/31/10
Potassium	7440-09-7	1/ 1	1.3	1.3	1.3	3.17	No	Essential Nutrient	--	--	1750	RDA	No	Essential Nutrient	LNWsw-086	03/31/10
Selenium	7782-49-2	1/ 1	0.0002	0.0002	0.0002	0	Yes	Exceeds background	--	--	0.01	RSL	No	Below risk screening criteria	LNWsw-086	03/31/10
Sodium	7440-23-5	1/ 1	2.3	2.3	2.3	21.3	No	Essential Nutrient	--	--	1200	RDA	No	Essential Nutrient	LNWsw-086	03/31/10
Vanadium	7440-62-2	1/ 1	0.0012	0.0012	0.0012	0	Yes	Exceeds background	0.211	0.0706	0.0706	RC	No	Below risk screening criteria	LNWsw-086	03/31/10
<i>Explosives</i>																
Nitrocellulose	9004-70-0	1/ 1	0.13	0.13	0.13	--	Yes	Detected organic	--	--	6000	RSL	No	Below risk screening criteria	LNWsw-086	03/31/10
<i>Semi-volatile Organic Compounds</i>																
Bis(2-ethylhexyl)phthalate	117-81-7	1/ 1	0.0048	0.0048	0.0048	--	Yes	Detected organic	0.00349	0.00927	0.00349	RA	Yes	Exceeds screening level	LNWsw-086	03/31/10
<i>Volatile Organic Compounds</i>																
Acetone	67-64-1	1/ 1	0.0021	0.0021	0.0021	--	Yes	Detected organic	--	--	1.4	RSL	No	Below risk screening criteria	LNWsw-086	03/31/10

^aBackground criteria for surface water from final facility-wide background values for RVAAP, published in the Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio (USACE 2001).

^bFacility-Wide Cleanup Goals (FWCUG) for Resident Adult (RA) and Resident Child (RC) from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^cScreening Level Source:

RDA = Concentration associated with recommended daily allowance of essential nutrient

RA = FWCUG for Resident Adult

RC = FWCUG for Resident Child

RSL = United States Environmental Protection Agency (USEPA) Residential Regional Screening Level

^dFWCUG is the most conservative (smallest) of the FWCUGs for hexavalent and trivalent chromium.

CAS = Chemical Abstract Service

COPC = Chemical of Potential Concern

HQ = Hazard Quotient

ISM = Incremental Sampling Methodology

SRC = Site-related Contaminant

--=No value available

Bold = Chemical is a COPC

**Table G-6. COC Screening for Surface Soil (0-1 ft bgs ISM Samples) at the Landfill North of Winklepeck Burning Grounds
Unrestricted Land Use Receptor: Resident (Adult and Child)**

Sample ID	Date	COPC		Chromium ^c	Benzo(a)pyrene	Benzo(b)fluoranthene	Dibenz(a,h)anthracene	
		CAS Number		7440-47-3	50-32-8	205-99-2	53-70-3	
		Resident FWCUG ^a :						
		HQ=1		81,473	--	--	--	
		Risk=10 ⁻⁵		--	0.221	2.21	0.221	
		Background Criteria ^b		17.4 (27.2)	--	--	--	
		Depth (ft bgs)	Station	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	
LNWss-028M-SO	10/26/2004	0.0 - 1.0	LNWss-028M	18 No	0.033J No	0.045 No	<0.034U No	
LNWss-029M-SO	10/25/2004	0.0 - 1.0	LNWss-029M	21 No	<0.034U No	0.015J No	<0.034U No	
LNWss-030M-SO	10/25/2004	0.0 - 1.0	LNWss-030M	23 No	0.011J No	0.014J No	<0.034U No	
LNWss-031M-SO	10/26/2004	0.0 - 1.0	LNWss-031M	21 No	0.013J No	0.016J No	<0.033U No	
LNWss-032M-SO	10/26/2004	0.0 - 1.0	LNWss-032M	26 No	<0.034U No	<0.034U No	<0.034U No	
LNWss-033M-SO	10/26/2004	0.0 - 1.0	LNWss-033M	25 No	<0.034U No	<0.034U No	<0.034U No	
LNWss-034M-SO	11/01/2004	0.0 - 1.0	LNWss-034M	18 No	<0.033U No	0.012J No	<0.033U No	
LNWss-035M-SO	10/26/2004	0.0 - 1.0	LNWss-035M	17 No	<0.034U No	0.0094J No	<0.034U No	
LNWss-036M-SO	10/26/2004	0.0 - 1.0	LNWss-036M	21 No	<0.034U No	<0.034U No	<0.034U No	
LNWss-037M-SO	11/01/2004	0.0 - 1.0	LNWss-037M	18 No	0.011J No	0.016J No	<0.037U No	
LNWss-038M-SO	11/01/2004	0.0 - 1.0	LNWss-038M	18 No	0.012J No	0.018J No	<0.033U No	
LNWss-039M-SO	11/01/2004	0.0 - 1.0	LNWss-039M	16 No	0.017J No	0.029J No	<0.039U No	
LNWss-042M-SO	11/01/2004	0.0 - 1.0	LNWss-042M	22 No	0.14 No	0.21 No	<0.034U No	
LNWss-070M-5280-SO	03/31/2010	0.0 - 1.0	LNWss-070M	18.2J No	0.16 No	0.23 No	0.028 No	
LNWss-071M-5281-SO	04/01/2010	0.0 - 1.0	LNWss-071M	19.2J No	0.016 No	0.038 No	<0.0068U No	
LNWss-072M-5282-SO	04/01/2010	0.0 - 1.0	LNWss-072M	21.1J No	0.011 No	0.024 No	<0.0068U No	
LNWss-073M-5283-SO	04/01/2010	0.0 - 1.0	LNWss-073M	15.3J No	0.017 No	0.024 No	<0.0068U No	
LNWss-074M-5284-SO	04/01/2010	0.0 - 1.0	LNWss-074M	17.8J No	0.019 No	0.032 No	<0.0068U No	
LNWss-075M-5285-SO	03/31/2010	0.0 - 1.0	LNWss-075M	13J No	<0.0068U No	<0.0068U No	<0.0068U No	
LNWss-076M-5286-SO	03/31/2010	0.0 - 1.0	LNWss-076M	13.8J No	<0.0068U No	<0.0068U No	<0.0068U No	
LNWss-077M-5287-SO	04/01/2010	0.0 - 1.0	LNWss-077M	16.9J No	0.011J No	0.022J No	<0.051U No	
LNWss-078M-5288-SO	04/01/2010	0.0 - 1.0	LNWss-078M	14.2J No	0.025 No	0.036 No	<0.0085U No	
LNWss-079M-5289-SO	04/01/2010	0.0 - 1.0	LNWss-079M	16J No	0.011 No	0.022 No	<0.0068U No	

All units in mg/kg.

^aFacility-Wide Cleanup Goals (FWCUG) for Resident Adult (RA) and Resident Child (RC) from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^bBackground criteria for soil 0-1 ft bgs and >1 ft bgs from final facility-wide background values for RVAAP, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).

^cBased on the lines of evidence presented in Section 7.2.3.1, the concentration of total chromium detected at Landfill North of Winklepeck Burning Grounds are compared to the FWCUG for trivalent chromium.

Data Qualifiers:

J= indicates that the analyte was positively identified, but the associated numerical value is an approximate concentration of the analyte in the sample

U= not detected

UJ=not detected and reporting limit estimated

bgs = below ground surface

CAS = Chemical Abstract Service

COC = Chemical of Concern

COPC = Chemical of potential concern.

HQ = Hazard Quotient

ISM = Incremental Sampling Methodology

Bold = Concentration in this sample exceeds FWCUG

-- =No value available

**Table G-7. Sum-of-Ratios for Carcinogens
COC Screening for Surface Soil (0-1 ft bgs ISM Samples) at the Landfill North of Winklepeck Burning Grounds
Unrestricted Land Use Receptor: Resident (Adult and Child)**

Sample ID	Date	COPC		Benzo(a)pyrene		Benzo(b)fluoranthene		Dibenz(a,h)anthracene		SOR	
		CAS Number		50-32-8		205-99-2		53-70-3			
		Resident FWCUG ^a :									
		Risk=10 ⁻⁵		0.221		2.21		0.221			
Depth (ft bgs)	Station	Result	Ratio	Result	Ratio	Result	Ratio				
LNW _{ss} -028M-SO	10/26/2004	0.0 - 1.0	LNW _{ss} -028M	0.033	0.1	0.045	<0.1	<0.034U	--	0.2	
LNW _{ss} -029M-SO	10/25/2004	0.0 - 1.0	LNW _{ss} -029M	<0.034U	--	0.015	<0.1	<0.034U	--	<0.1	
LNW _{ss} -030M-SO	10/25/2004	0.0 - 1.0	LNW _{ss} -030M	0.011	<0.1	0.014	<0.1	<0.034U	--	0.1	
LNW _{ss} -031M-SO	10/26/2004	0.0 - 1.0	LNW _{ss} -031M	0.013	0.1	0.016	<0.1	<0.033U	--	0.1	
LNW _{ss} -032M-SO	10/26/2004	0.0 - 1.0	LNW _{ss} -032M	<0.034U	--	<0.034U	--	<0.034U	--	--	
LNW _{ss} -033M-SO	10/26/2004	0.0 - 1.0	LNW _{ss} -033M	<0.034U	--	<0.034U	--	<0.034U	--	--	
LNW _{ss} -034M-SO	11/01/2004	0.0 - 1.0	LNW _{ss} -034M	<0.033U	--	0.012	<0.1	<0.033U	--	<0.1	
LNW _{ss} -035M-SO	10/26/2004	0.0 - 1.0	LNW _{ss} -035M	<0.034U	--	0.0094	<0.1	<0.034U	--	<0.1	
LNW _{ss} -036M-SO	10/26/2004	0.0 - 1.0	LNW _{ss} -036M	<0.034U	--	<0.034U	--	<0.034U	--	--	
LNW _{ss} -037M-SO	11/01/2004	0.0 - 1.0	LNW _{ss} -037M	0.011	<0.1	0.016	<0.1	<0.037U	--	0.1	
LNW _{ss} -038M-SO	11/01/2004	0.0 - 1.0	LNW _{ss} -038M	0.012	0.1	0.018	<0.1	<0.033U	--	0.1	
LNW _{ss} -039M-SO	11/01/2004	0.0 - 1.0	LNW _{ss} -039M	0.017	0.1	0.029	<0.1	<0.039U	--	0.1	
LNW _{ss} -042M-SO	11/01/2004	0.0 - 1.0	LNW _{ss} -042M	0.14	0.6	0.21	0.1	<0.034U	--	0.7	
LNW _{ss} -070M-5280-SO	03/31/2010	0.0 - 1.0	LNW _{ss} -070M	0.16	0.7	0.23	0.1	0.028	0.1	1	
LNW _{ss} -071M-5281-SO	04/01/2010	0.0 - 1.0	LNW _{ss} -071M	0.016	0.1	0.038	<0.1	<0.0068U	--	0.1	
LNW _{ss} -072M-5282-SO	04/01/2010	0.0 - 1.0	LNW _{ss} -072M	0.011	<0.1	0.024	<0.1	<0.0068U	--	0.1	
LNW _{ss} -073M-5283-SO	04/01/2010	0.0 - 1.0	LNW _{ss} -073M	0.017	0.1	0.024	<0.1	<0.0068U	--	0.1	
LNW _{ss} -074M-5284-SO	04/01/2010	0.0 - 1.0	LNW _{ss} -074M	0.019	0.1	0.032	<0.1	<0.0068U	--	0.1	
LNW _{ss} -075M-5285-SO	03/31/2010	0.0 - 1.0	LNW _{ss} -075M	<0.0068U	--	<0.0068U	--	<0.0068U	--	--	
LNW _{ss} -076M-5286-SO	03/31/2010	0.0 - 1.0	LNW _{ss} -076M	<0.0068U	--	<0.0068U	--	<0.0068U	--	--	
LNW _{ss} -077M-5287-SO	04/01/2010	0.0 - 1.0	LNW _{ss} -077M	0.011	<0.1	0.022	<0.1	<0.051U	--	0.1	
LNW _{ss} -078M-5288-SO	04/01/2010	0.0 - 1.0	LNW _{ss} -078M	0.025	0.1	0.036	<0.1	<0.0085U	--	0.1	
LNW _{ss} -079M-5289-SO	04/01/2010	0.0 - 1.0	LNW _{ss} -079M	0.011	<0.1	0.022	<0.1	<0.0068U	--	0.1	

All units in mg/kg.

^aFacility-Wide Cleanup Goals (FWCUGs) for Resident Adult (RA) and Resident Child (RC) from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010). Lower of the two values for RA or RC is presented.

Data Qualifiers:

U= not detected

bgs = below ground surface

CAS = Chemical Abstract Service

COC = Chemical of Concern

COPC = Chemical of potential concern.

ISM = Incremental Sampling Methodology

-- = No value available

SOR = Sum-of-ratios

Bold = SOR greater than 1

**Table G-8. COC Screening for Subsurface Soil (1-13 ft bgs Discrete Samples) at the Landfill North of Winklepeck Burning Grounds
Unrestricted Land Use Receptor: Resident (Adult and Child)**

COPC	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	UCL 95	Dist.	EPC	Resident FWCUG ^a		Background Criteria ^b	EPC Exceeds FWCUG?
									HQ=1	Risk=10 ⁻⁵		
<i>Inorganic Chemicals</i>												
Thallium	7440-28-0	8/ 21	0.21	1.7	0.511	0.674	D	0.674	6.12	--	0.91	No

All units are mg/kg.

^aFacility-Wide Cleanup Goal (FWCUG) is the most conservative (smallest) of the FWCUGs for Resident Adult and Resident Child from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^bBackground criteria for soil >1 ft bgs from final facility-wide background values for RVAAP, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).

UCL 95=95% upper confidence limit of the mean.

Dist.: N=normal distribution, t statistic used for UCL 95 calculation

L=lognormal distribution, Land statistic used for UCL 95 calculation

D=fewer than 5 or 50% detects, t statistic used for UCL 95 calculation

X=distribution neither normal nor lognormal, t statistic used for UCL 95 calculation

bgs = below ground surface

CAS = Chemical Abstract Service

COC = Chemical of Concern

COPC = Chemical of potential concern.

EPC = Exposure Point Concentration

HQ = Hazard Quotient

--=No value available

Bold = EPC exceeds FWCUG

Table G-9. COC Screening for Sediment at the Landfill North of Winklepeck Burning Grounds

COPC	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Resident FWCUG ^a		Background Criteria ^b	MDC Exceeds FWCUG?	Ratio (Carcinogens)	Station at Max Detect
						HQ = 1	TR = 10 ⁻⁵				
East Tributary											
Discrete Samples											
Cobalt ^c	7440-48-4	3/ 3	7	10.2	8.5	23	4200	9.1	No	0.002	LNWsd-084
Benzo(a)pyrene	50-32-8	3/ 3	0.014	0.044	0.024	--	0.221	--	No	0.2	LNWsd-083
Sum-of-Ratios										0.2	
ISM Samples											
Benzo(a)pyrene	50-32-8	3/ 3	0.025	0.064	0.04	--	0.221	--	No	0.3	LNWsd-044M
South Tributary											
Discrete Samples											
Cobalt ^c	7440-48-4	1/ 1	10	10	10	23	4200	9.1	No	0.002	LNWsd-086
ISM Samples											
None											

All units are mg/kg.

^aBackground criteria for sediment from final facility-wide background values for RVAAP, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).

^bFacility-Wide Cleanup Goal (FWCUG) is the most conservative (smallest) of the FWCUGs for Resident Adult and Resident Child from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^cNo FWCUG is available for cobalt in sediment. The USEPA soil regional screening level (RSL) is used.

CAS = Chemical Abstract Service

COC = Chemical of Concern

COPC = Chemical of potential concern.

HQ = Hazard Quotient

ISM = Incremental Sampling Methodology

MDC = maximum detected concentration

TR = Target Risk

--=No value available

Table G-10. COC Screening for Surface Water at the Landfill North of Winklepeck Burning Grounds

COPC	CAS Number	Freq of Detect	Minimum Detect	Maximum Detect	Average Result	Resident FWCUG ^a		Background Criteria ^b	MDC Exceeds FWCUG?	Ratio (Non-Carcinogens)	Station at Max Detect
						HQ = 1	TR = 10 ⁻⁵				
East Tributary											
Bis(2-ethylhexyl)phthalate	117-81-7	2/3	0.0009	0.005	0.00363	0.223	0.0349	--	No	0.02	LNWsw-085
South Tributary											
Cobalt	7440-48-4	1/1	0.0013	0.0013	0.0013	0.006	--	0	No	0.2	LNWsw-086
Manganese	7439-96-5	1/1	0.77	0.77	0.77	6.326	--	0.391	No	0.1	LNWsw-086
Bis(2-ethylhexyl)phthalate	117-81-7	1/1	0.0048	0.0048	0.0048	0.223	0.0349	--	No	0.02	LNWsw-086
Sum-of-Ratios										0.4	

All units are mg/L.

^aBackground criteria for surface water from final facility-wide background values for RVAAP, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).

^bFacility-Wide Cleanup Goal (FWCUG) is the most conservative (smallest) of the FWCUGs for Resident Adult and Resident Child from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

CAS = Chemical Abstract Service

COC = Chemical of Concern

COPC = Chemical of potential concern.

HQ = Hazard Quotient

MDC = maximum detected concentration

TR = Target Risk

--=No value available