

APPENDIX G

Human Health Risk Assessment Tables

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Table G-1. SRC and COPC Screening for Surface Soil (0-1 ft bgs ISM Samples) at Load Line 5

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	NGT						
Inorganic Chemicals and Anions																	
Aluminum	7429-90-5	60/ 60	7090	18000	10500	17700	Yes	Exceeds background	52923	7380	3496	3496	NGT	Yes	Exceeds screening level	LL5ss-005M	11/19/2004
Antimony	7440-36-0	18/ 59	0.1	0.46	1.62	0.96	No	Below background	13.6	2.82	175	2.82	RC	No	Below background	LL5ss-010M	11/15/2004
Arsenic	7440-38-2	60/ 60	4.3	14	10.3	15.4	No	Below background	0.425	0.524	2.78	0.425	RA	No	Below background	LL5ss-002M	11/12/2004
Barium	7440-39-3	60/ 60	36.8	220	69.5	88.4	Yes	Exceeds background	8966	1413	351	351	NGT	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Beryllium	7440-41-7	45/ 60	0.48	4.2	0.716	0.88	Yes	Exceeds background	--	--	--	16	RSL	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Cadmium	7440-43-9	41/ 60	0.08	3	0.509	0	Yes	Exceeds background	22.3	6.41	10.9	6.41	RC	No	Below risk screening criteria	LL5ss-019M	11/12/2004
Calcium	7440-70-2	60/ 60	840	140000	11400	15800	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5ss-005M	11/19/2004
Chromium ^d	7440-47-3	60/ 60	13.3	86.7	23	17.4	Yes	Exceeds background	90.4	19.9	1.64	1.64	NGT	Yes	Exceeds screening level	LL5ss-038M	8/12/2007
Cobalt	7440-48-4	60/ 60	1.9	13.3	7.83	10.4	Yes	Exceeds background	803	131	7.03	7.03	NGT	Yes	Exceeds screening level	LL5ss-068M	3/3/2010
Copper	7440-50-8	60/ 60	9.1	49	17.5	17.7	Yes	Exceeds background	2714	311	25368	311	RC	No	Below risk screening criteria	LL5ss-001M	11/12/2004
Iron	7439-89-6	60/ 60	11000	26000	20500	23100	No	Essential Nutrient	19010	2313	184370	180000	RDA	No	Essential Nutrient	LL5ss-023M	11/15/2004
Lead	7439-92-1	60/ 60	15.6	170	38.6	26.1	Yes	Exceeds background	--	--	--	400	RSL	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Magnesium	7439-95-4	60/ 60	1500	16000	3060	3030	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5ss-005M	11/19/2004
Manganese	7439-96-5	60/ 60	240	3100	576	1450	Yes	Exceeds background	1482	293	35.1	35.1	NGT	Yes	Exceeds screening level	LL5ss-005M	11/19/2004
Mercury	7439-97-6	48/ 60	0.018	3	0.15	0.036	Yes	Exceeds background	16.5	2.27	172	2.27	RC	Yes	Exceeds screening level	LL5ss-012M	11/15/2004
Nickel	7440-02-0	60/ 60	12	33	21.1	21.1	Yes	Exceeds background	1346	155	12639	155	RC	No	Below risk screening criteria	LL5ss-028M	11/15/2004
Nitrate	14797-55-8	18/ 29	0.38	32	2.01	--	Yes	Exceeds background	114196	12487	1E+06	12487	RC	No	Below risk screening criteria	LL5ss-019M	11/12/2004
Potassium	7440-09-7	51/ 60	636	2100	945	927	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5ss-020M	11/15/2004
Selenium	7782-49-2	41/ 60	0.47	1.8	0.697	1.4	Yes	Exceeds background	--	--	--	39	RSL	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Silver	7440-22-4	1/ 60	0.022	0.022	0.49	0	Yes	Exceeds background	324	38.6	3105	38.6	RC	No	Below risk screening criteria	LL5ss-066M	3/3/2010
Sodium	7440-23-5	45/ 60	29.8	970	176	123	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5ss-005M	11/19/2004
Thallium	7440-28-0	21/ 60	0.11	0.28	0.427	0	Yes	Exceeds background	4.76	0.612	47.7	0.612	RC	No	Below risk screening criteria	LL5ss-017M	11/15/2004
Vanadium	7440-62-2	60/ 60	11	25	18.2	31.1	No	Below background	156	44.9	2304	44.9	RC	No	Below background	LL5ss-010M	11/15/2004
Zinc	7440-66-6	60/ 60	40.3	140	76.1	61.8	Yes	Exceeds background	19659	2321	187269	2321	RC	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Explosives																	
4-Nitrotoluene	99-99-0	1/ 60	0.07	0.07	0.144	--	Yes	Detected organic	81.6	52.5	982	52.5	RC	No	Below risk screening criteria	LL5ss-021M	11/19/2004
HMX	2691-41-0	1/ 60	0.012	0.012	0.11	--	Yes	Detected organic	1909	359	23464	359	RC	No	Below risk screening criteria	LL5ss-071M	3/8/2010
Nitrocellulose	9004-70-0	4/ 8	1.4	3.1	1.68	--	Yes	Detected organic	--	--	--	19000000	RSL	No	Below risk screening criteria	LL5ss-033M	8/12/2007
Tetryl	479-45-8	1/ 60	0.017	0.017	0.158	--	Yes	Detected organic	--	--	--	16	RSL	No	Below risk screening criteria	LL5ss-077M	3/8/2010
Pesticide/PCBs																	
beta-BHC	319-85-7	1/ 9	0.0018	0.0018	0.00571	--	Yes	Detected organic	0.77	0.496	7.42	0.496	RC	No	Below risk screening criteria	LL5ss-072M	3/8/2010
PCB-1254	11097-69-1	1/ 9	0.038	0.038	0.0218	--	Yes	Detected organic	0.203	0.12	3.46	0.12	RC	No	Below risk screening criteria	LL5ss-005M	11/19/2004

Table G-1. SRC and COPC Screening for Surface Soil (0-1 ft bgs ISM Samples) at Load Line 5 (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	NGT						
Semi-volatile Organic Compounds																	
2-Methylnaphthalene	91-57-6	5/ 9	0.016	0.11	0.145	--	Yes	Detected organic	238	30.6	2384	30.6	RC	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Acenaphthene	83-32-9	4/ 22	0.018	0.038	0.0592	--	Yes	Detected organic	--	--	--	360	RSL	No	Below risk screening criteria	LL5ss-064M	3/3/2010
Acenaphthylene ^e	208-96-8	1/ 22	0.016	0.016	0.0583	--	Yes	Detected organic	--	--	--	180	RSL	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Anthracene	120-12-7	7/ 22	0.0092	0.16	0.0742	--	Yes	Detected organic	--	--	--	1800	RSL	No	Below risk screening criteria	LL5ss-069M	3/3/2010
Benz(a)anthracene	56-55-3	19/ 22	0.0098	1.4	0.182	--	Yes	Detected organic	0.221	0.65	4.77	0.221	RA	Yes	Exceeds screening level	LL5ss-042M	8/9/2007
Benzenemethanol	100-51-6	2/ 6	0.46	1.3	0.543	--	Yes	Detected organic	--	--	--	630	RSL	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Benzo(a)pyrene	50-32-8	18/ 22	0.0089	0.53	0.126	--	Yes	Detected organic	0.022	0.065	0.477	0.022	RA	Yes	Exceeds screening level	LL5ss-064M	3/3/2010
Benzo(b)fluoranthene	205-99-2	19/ 22	0.016	0.78	0.162	--	Yes	Detected organic	0.221	0.65	4.77	0.221	RA	Yes	Exceeds screening level	LL5ss-064M	3/3/2010
Benzo(ghi)perylene ^e	191-24-2	16/ 22	0.0094	0.28	0.0954	--	Yes	Detected organic	--	--	--	180	RSL	No	Below risk screening criteria	LL5ss-064M	3/3/2010
Benzo(k)fluoranthene	207-08-9	15/ 22	0.0099	0.4	0.104	--	Yes	Detected organic	2.21	6.5	47.7	2.21	RA	No	Below risk screening criteria	LL5ss-064M	3/3/2010
Bis(2-ethylhexyl)phthalate	117-81-7	2/ 9	0.12	0.13	0.183	--	Yes	Detected organic	--	--	--	39	RSL	No	Below risk screening criteria	LL5ss-069M	3/3/2010
Carbazole	86-74-8	2/ 9	0.017	0.038	0.143	--	Yes	Detected organic	69.4	44.6	835	44.6	RC	No	Below risk screening criteria	LL5ss-012M	11/15/2004
Chrysene	218-01-9	20/ 22	0.012	1.4	0.19	--	Yes	Detected organic	22.1	65	477	22.1	RA	No	Below risk screening criteria	LL5ss-042M	8/9/2007
Dibenz(a,h)anthracene	53-70-3	5/ 22	0.013	0.092	0.0648	--	Yes	Detected organic	0.022	0.065	0.477	0.022	RA	Yes	Exceeds screening level	LL5ss-064M	3/3/2010
Dibenzofuran	132-64-9	2/ 9	0.0099	0.039	0.247	--	Yes	Detected organic	119	15.3	1192	15.3	RC	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Di-n-butyl phthalate	84-74-2	1/ 9	0.022	0.022	0.249	--	Yes	Detected organic	--	--	--	630	RSL	No	Below risk screening criteria	LL5ss-072M	3/8/2010
Fluoranthene	206-44-0	20/ 22	0.014	3.3	0.368	--	Yes	Detected organic	276	163	5087	163	RC	No	Below risk screening criteria	LL5ss-042M	8/9/2007
Fluorene	86-73-7	5/ 22	0.014	0.031	0.059	--	Yes	Detected organic	737	243	11458	243	RC	No	Below risk screening criteria	LL5ss-064M	3/3/2010
Indeno(1,2,3-cd)pyrene	193-39-5	15/ 22	0.0088	0.27	0.0925	--	Yes	Detected organic	0.221	0.65	4.77	0.221	RA	Yes	Exceeds screening level	LL5ss-069M	3/3/2010
Naphthalene	91-20-3	15/ 22	0.0098	0.095	0.0665	--	Yes	Detected organic	368	122	1541	122	RC	No	Below risk screening criteria	LL5ss-005M	11/19/2004
Phenanthrene ^e	85-01-8	19/ 22	0.01	1.6	0.165	--	Yes	Detected organic	--	--	--	180	RSL	No	Below risk screening criteria	LL5ss-042M	8/9/2007
Phenol	108-95-2	1/ 9	0.046	0.046	0.261	--	Yes	Detected organic	--	--	--	1900	RSL	No	Below risk screening criteria	LL5ss-018M	11/19/2004
Pyrene	129-00-0	20/ 22	0.013	2.5	0.293	--	Yes	Detected organic	207	122	3815	122	RC	No	Below risk screening criteria	LL5ss-042M	8/9/2007

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

^cScreening Level Source:

- NGT = FWCUG for National Guard Trainee
- 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 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
ISM = Incremental Sampling Method
PAH = Polycyclic Aromatic Hydrocarbon
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 Load Line 5

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	NGT						
Inorganic Chemicals																	
Aluminum	7429-90-5	13/ 13	7090	18900	10600	19500	No	Below background	52923	7380	3496	3496	NGT	No	Below background	LL5sb-056	3/3/2010
Antimony	7440-36-0	5/ 9	0.074	0.12	0.185	0.96	No	Below background	13.6	2.82	175	2.82	RC	No	Below background	LL5sb-057	3/8/2010
Arsenic	7440-38-2	13/ 13	8.8	17.2	12.1	19.8	No	Below background	0.425	0.524	2.78	0.425	RA	No	Below background	LL5sb-054	3/8/2010
Barium	7440-39-3	13/ 13	23.4	110	62.5	124	No	Below background	8966	1413	351	351	NGT	No	Below background	LL5sb-056	3/3/2010
Beryllium	7440-41-7	13/ 13	0.29	0.86	0.555	0.88	No	Below background	--	--	--	16	RSL	No	Below background	LL5sb-056	3/3/2010
Cadmium	7440-43-9	10/ 13	0.027	0.092	0.052	0	Yes	Exceeds background	22.3	6.41	10.9	6.41	RC	No	Below risk screening criteria	LL5sb-053	3/3/2010
Calcium	7440-70-2	13/ 13	571	38300	16400	35500	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5sb-055	3/3/2010
Chromium ^d	7440-47-3	13/ 13	7.6	26.5	16.3	27.2	No	Below background	90.4	19.9	1.64	1.64	NGT	No	Below background	LL5sb-056	3/3/2010
Cobalt	7440-48-4	13/ 13	5.2	13.2	10	23.2	No	Below background	803	131	7.03	7.03	NGT	No	Below background	LL5sb-054	3/8/2010
Copper	7440-50-8	13/ 13	15	21.8	18.6	32.3	No	Below background	2714	311	25368	311	RC	No	Below background	LL5sb-054	3/8/2010
Iron	7439-89-6	13/ 13	15500	29200	25100	35200	No	Essential Nutrient	19010	2313	184370	180000	RDA	No	Essential Nutrient	LL5sb-056	3/3/2010
Lead	7439-92-1	13/ 13	9	14.2	11.2	19.1	No	Below background	--	--	--	400	RSL	No	Below background	LL5sb-055	3/3/2010
Magnesium	7439-95-4	13/ 13	1430	8590	5330	8790	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5sb-054	3/8/2010
Manganese	7439-96-5	13/ 13	218	489	339	3030	No	Below background	1482	293	35.1	35.1	NGT	No	Below background	LL5sb-053	3/3/2010
Mercury	7439-97-6	7/ 13	0.019	0.049	0.0427	0.044	Yes	Exceeds background	16.5	2.27	172	2.27	RC	No	Below risk screening criteria	LL5sb-055	3/3/2010
Nickel	7440-02-0	13/ 13	11.7	31.8	24.7	60.7	No	Below background	1346	155	12639	155	RC	No	Below background	LL5sb-056	3/3/2010
Potassium	7440-09-7	13/ 13	413	2580	1340	3350	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5sb-056	3/3/2010
Selenium	7782-49-2	13/ 13	0.66	1	0.79	1.5	No	Below background	--	--	--	39	RSL	No	Below background	LL5sb-054	3/8/2010
Silver	7440-22-4	7/ 13	0.017	0.075	0.0202	0	Yes	Exceeds background	324	38.6	3105	38.6	RC	No	Below risk screening criteria	LL5sb-054	3/8/2010
Sodium	7440-23-5	13/ 13	24.2	94.7	62.5	145	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5sb-056	3/3/2010
Thallium	7440-28-0	13/ 13	0.091	0.23	0.169	0.91	No	Below background	4.76	0.612	47.7	0.612	RC	No	Below background	LL5sb-056	3/3/2010
Vanadium	7440-62-2	13/ 13	10.7	27.4	18.1	37.6	No	Below background	156	44.9	2304	44.9	RC	No	Below background	LL5sb-056	3/3/2010
Zinc	7440-66-6	13/ 13	48.3	64.9	54.5	93.3	No	Below background	19659	2321	187269	2321	RC	No	Below background	LL5sb-056	3/3/2010
Semi-volatile Organic Compounds																	
Bis(2-ethylhexyl)phthalate	117-81-7	1/ 2	0.025	0.025	0.113	--	Yes	Detected organic	--	--	--	39	RSL	No	Below risk screening criteria	LL5sb-053	3/3/2010

^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), Resident Child (RC), and National Guard Trainee (NGT) from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^cScreening Level Source:

NGT = FWCUG for National Guard Trainee

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 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 Contaminant

-- = No value available

Bold = Chemical is a COPC

Table G-3. SRC and COPC Screening for Sediment (Discrete Samples) at the Load Line 5 Wetland

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	NGT						
Inorganic Chemicals																	
Aluminum	7429-90-5	1/ 1	14900	14900	14900	13900	Yes	Exceeds background	52923	7380	3496	3496	NGT	Yes	Exceeds screening level	LL5sd-078	04/13/10
Antimony	7440-36-0	1/ 1	0.15	0.15	0.15	0	Yes	Exceeds background	13.6	2.82	175	2.82	RC	No	Below risk screening criteria	LL5sd-078	04/13/10
Arsenic	7440-38-2	1/ 1	10.8	10.8	10.8	19.5	No	Below background	0.425	0.524	2.78	0.425	RA	No	Below background	LL5sd-078	04/13/10
Barium	7440-39-3	1/ 1	86.6	86.6	86.6	123	No	Below background	8966	1413	351	351	NGT	No	Below background	LL5sd-078	04/13/10
Beryllium	7440-41-7	1/ 1	0.74	0.74	0.74	0.38	Yes	Exceeds background	--	--	--	16	RSL	No	Below risk screening criteria	LL5sd-078	04/13/10
Cadmium	7440-43-9	1/ 1	0.24	0.24	0.24	0	Yes	Exceeds background	22.3	6.41	10.9	6.41	RC	No	Below risk screening criteria	LL5sd-078	04/13/10
Calcium	7440-70-2	1/ 1	1570	1570	1570	5510	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5sd-078	04/13/10
Chromium ^d	7440-47-3	1/ 1	16.7	16.7	16.7	18.1	No	Below background	90.4	19.9	1.64	1.64	NGT	No	Below background	LL5sd-078	04/13/10
Cobalt ^e	7440-48-4	1/ 1	8.1	8.1	8.1	9.1	No	Below background	803	131	7.03	7.03	NGT	No	Below background	LL5sd-078	04/13/10
Copper	7440-50-8	1/ 1	12.9	12.9	12.9	27.6	No	Below background	2714	311	25368	311	RC	No	Below background	LL5sd-078	04/13/10
Iron	7439-89-6	1/ 1	24500	24500	24500	28200	No	Essential Nutrient	19010	2313	184370	180000	RDA	No	Essential Nutrient	LL5sd-078	04/13/10
Lead	7439-92-1	1/ 1	21	21	21	27.4	No	Below background	--	--	--	400	RSL	No	Below background	LL5sd-078	04/13/10
Magnesium	7439-95-4	1/ 1	2160	2160	2160	2760	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5sd-078	04/13/10
Manganese	7439-96-5	1/ 1	620	620	620	1950	No	Below background	1482	293	35.1	35.1	NGT	No	Below background	LL5sd-078	04/13/10
Mercury	7439-97-6	1/ 1	0.075	0.075	0.075	0.059	Yes	Exceeds background	16.5	2.27	172	2.27	RC	No	Below risk screening criteria	LL5sd-078	04/13/10
Nickel	7440-02-0	1/ 1	15.2	15.2	15.2	17.7	No	Below background	1346	155	12639	155	RC	No	Below background	LL5sd-078	04/13/10
Potassium	7440-09-7	1/ 1	1110	1110	1110	1950	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5sd-078	04/13/10
Selenium	7782-49-2	1/ 1	0.92	0.92	0.92	1.7	No	Below background	--	--	--	39	RSL	No	Below background	LL5sd-078	04/13/10
Silver	7440-22-4	1/ 1	0.078	0.078	0.078	0	Yes	Exceeds background	324	38.6	3105	38.6	RC	No	Below risk screening criteria	LL5sd-078	04/13/10
Sodium	7440-23-5	1/ 1	40.6	40.6	40.6	112	No	Essential Nutrient	--	--	--	1000000	RDA	No	Essential Nutrient	LL5sd-078	04/13/10
Thallium	7440-28-0	1/ 1	0.26	0.26	0.26	0.89	No	Below background	4.76	0.612	47.7	0.612	RC	No	Below background	LL5sd-078	04/13/10
Vanadium	7440-62-2	1/ 1	26.8	26.8	26.8	26.1	Yes	Exceeds background	156	44.9	2304	44.9	RC	No	Below risk screening criteria	LL5sd-078	04/13/10
Zinc	7440-66-6	1/ 1	74.7	74.7	74.7	532	No	Below background	19659	2321	187269	2321	RC	No	Below background	LL5sd-078	04/13/10
Semi-volatile Organic Compounds																	
Benzo(a)pyrene	50-32-8	1/ 1	0.013	0.013	0.013	--	Yes	Detected organic	0.022	0.065	0.477	0.022	RA	No	Below risk screening criteria	LL5sd-078	04/13/10
Benzo(b)fluoranthene	205-99-2	1/ 1	0.021	0.021	0.021	--	Yes	Detected organic	0.221	0.65	4.77	0.221	RA	No	Below risk screening criteria	LL5sd-078	04/13/10
Chrysene	218-01-9	1/ 1	0.016	0.016	0.016	--	Yes	Detected organic	--	--	--	16	RSL	No	Below risk screening criteria	LL5sd-078	04/13/10
Fluoranthene	206-44-0	1/ 1	0.024	0.024	0.024	--	Yes	Detected organic	--	--	--	240	RSL	No	Below risk screening criteria	LL5sd-078	04/13/10
Phenanthrene ^f	85-01-8	1/ 1	0.0094	0.0094	0.0094	--	Yes	Detected organic	--	--	--	180	RSL	No	Below risk screening criteria	LL5sd-078	04/13/10
Pyrene	129-00-0	1/ 1	0.018	0.018	0.018	--	Yes	Detected organic	--	--	--	180	RSL	No	Below risk screening criteria	LL5sd-078	04/13/10

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

^cScreening Level Source:

NGT = FWCUG for National Guard Trainee

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 Residential Regional Screening Level

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

^eNo FWCUG available for cobalt in sediment. Value is FWCUG for cobalt in soil.

^fNo reference dose or cancer potency factors are available for this PAH, 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

SRC = Site-related Contaminant

-- = No value available

Bold = Chemical is a COPC

Table G-4. SRC and COPC Screening for Surface Water at the Load Line 5 Wetland

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	NGT						
Inorganic Chemicals																	
Aluminum	7429-90-5	1/ 1	0.129	0.129	0.129	3.37	No	Below background	63.895	14.827	73.445	14.827	RC	No	Below background	LL5sw-078	04/13/10
Arsenic	7440-38-2	1/ 1	0.0018	0.0018	0.0018	0.0032	No	Below background	0.0011	0.0012	0.0042	0.0011	RA	No	Below background	LL5sw-078	04/13/10
Barium	7440-39-3	1/ 1	0.0107	0.0107	0.0107	0.0475	No	Below background	12.131	2.901	10.64	2.901	RC	No	Below background	LL5sw-078	04/13/10
Calcium	7440-70-2	1/ 1	9.16	9.16	9.16	41.4	No	Essential Nutrient	--	--	--	500	RDA	No	Essential Nutrient	LL5sw-078	04/13/10
Cobalt	7440-48-4	1/ 1	0.00054	0.00054	0.00054	0	Yes	Exceeds background	--	--	--	0.0006	RSL	No	Below risk screening criteria	LL5sw-078	04/13/10
Copper	7440-50-8	1/ 1	0.0016	0.0016	0.0016	0.0079	No	Below background	2.788	0.614	7.199	0.614	RC	No	Below background	LL5sw-078	04/13/10
Iron	7439-89-6	1/ 1	1.5	1.5	1.5	2.56	No	Essential Nutrient	20	4.527	31.296	18	RDA	No	Essential Nutrient	LL5sw-078	04/13/10
Lead	7439-92-1	1/ 1	0.00054	0.00054	0.00054	0	Yes	Exceeds background	--	--	--	0.015	RSL	No	Below risk screening criteria	LL5sw-078	04/13/10
Magnesium	7439-95-4	1/ 1	1.89	1.89	1.89	10.8	No	Essential Nutrient	--	--	--	200	RDA	No	Essential Nutrient	LL5sw-078	04/13/10
Manganese	7439-96-5	1/ 1	0.136	0.136	0.136	0.391	No	Below background	2.476	0.633	1.449	0.633	RC	No	Below background	LL5sw-078	04/13/10
Nickel	7440-02-0	1/ 1	0.0014	0.0014	0.0014	0	Yes	Exceeds background	1.445	0.312	8.258	0.312	RC	No	Below risk screening criteria	LL5sw-078	04/13/10
Potassium	7440-09-7	1/ 1	3.25	3.25	3.25	3.17	No	Essential Nutrient	--	--	--	1750	RDA	No	Essential Nutrient	LL5sw-078	04/13/10
Sodium	7440-23-5	1/ 1	0.781	0.781	0.781	21.3	No	Essential Nutrient	--	--	--	1200	RDA	No	Essential Nutrient	LL5sw-078	04/13/10
Vanadium	7440-62-2	1/ 1	0.00054	0.00054	0.00054	0	Yes	Exceeds background	0.211	0.0706	0.0572	0.0572	NGT	No	Below risk screening criteria	LL5sw-078	04/13/10
Volatile Organic Compounds																	
Toluene	108-88-3	1/ 1	0.00022	0.00022	0.00022	--	Yes	Detected organic	--	--	--	0.11	RSL	No	Below risk screening criteria	LL5sw-078	04/13/10

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

^cScreening Level Source:

- NGT = FWCUG for National Guard Trainee
- 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 Residential Regional Screening Level

CAS = Chemical Abstract Service
COPC = Chemical of Potential Concern
HQ = Hazard Quotient
SRC = Site-related Contaminant
-- = No value available
Bold = Chemical is a COPC

Table G-5. COC Screening for Surface Soil (0-1 ft bgs ISM Samples) at Load Line 5 Unrestricted Land Use Receptor: Resident (Adult and Child)

Sample ID	Date	COPC		Aluminum	Chromium ^c	Cobalt	Manganese	Mercury	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene
		CAS Number		7429-90-5	7440-47-3	7440-48-4	7439-96-5	7439-97-6	56-55-3	50-32-8	205-99-2	53-70-3	193-39-5
		Resident (Adult and Child) FWCUG ^a :											
		HQ=1		73798	81473	1313	2927	22.7	--	--	--	--	--
		Risk=10 ⁻⁵		--	--	8030	--	--	2.21	0.221	2.21	0.221	2.21
		Background Criteria ^b		17700 (19500)	17.4 (27.2)	10.4 (23.2)	1450 (3030)	0.036 (0.044)	--	--	--	--	--
				Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	
Depth (ft bgs)	Station												
LL5ss-001M-SO	11/12/2004	0.0 - 1.0	LL5ss-001M	11000 No	33 No	7.2 No	500 No	0.09 No	NR	NR	NR	NR	NR
LL5ss-002M-SO	11/12/2004	0.0 - 1.0	LL5ss-002M	11000 No	22 No	6.5 No	330 No	0.04 No	NR	NR	NR	NR	NR
LL5ss-003M-SO	11/12/2004	0.0 - 1.0	LL5ss-003M	11000 No	17 No	6 No	510 No	0.06 No	NR	NR	NR	NR	NR
LL5ss-004M-SO	11/10/2004	0.0 - 1.0	LL5ss-004M	12000 No	20 No	8.8 No	800 No	0.67 No	NR	NR	NR	NR	NR
LL5ss-005M-SO	11/19/2004	0.0 - 1.0	LL5ss-005M	18000 No	34 No	1.9 No	3100 Yes	0.09 No	0.12 No	0.15 No	0.19 No	0.024J No	0.09 No
LL5ss-006M-SO	11/12/2004	0.0 - 1.0	LL5ss-006M	10000 No	20 No	8.6 No	650 No	<0.04U No	NR	NR	NR	NR	NR
LL5ss-007M-SO	11/12/2004	0.0 - 1.0	LL5ss-007M	10000 No	27 No	6.2 No	740 No	<0.04U No	NR	NR	NR	NR	NR
LL5ss-008M-SO	11/12/2004	0.0 - 1.0	LL5ss-008M	7400 No	18 No	6 No	470 No	<0.04U No	NR	NR	NR	NR	NR
LL5ss-009M-SO	11/15/2004	0.0 - 1.0	LL5ss-009M	11000 No	24 No	7.4 No	380 No	1 No	NR	NR	NR	NR	NR
LL5ss-010M-SO	11/15/2004	0.0 - 1.0	LL5ss-010M	13000 No	19 No	7.7 No	450 No	1.4 No	NR	NR	NR	NR	NR
LL5ss-011M-SO	11/12/2004	0.0 - 1.0	LL5ss-011M	12000 No	21 No	7.6 No	430 No	0.06 No	NR	NR	NR	NR	NR
LL5ss-012M-SO	11/15/2004	0.0 - 1.0	LL5ss-012M	11000 No	19 No	7.3 No	410 No	3 No	0.19 No	0.15 No	0.19 No	0.019J No	0.072 No
LL5ss-013M-SO	11/15/2004	0.0 - 1.0	LL5ss-013M	8300 No	16 No	6 No	660 No	0.05 No	NR	NR	NR	NR	NR
LL5ss-014M-SO	11/15/2004	0.0 - 1.0	LL5ss-014M	8300 No	16 No	6.8 No	460 No	<0.03U No	NR	NR	NR	NR	NR
LL5ss-015M-SO	11/15/2004	0.0 - 1.0	LL5ss-015M	8000 No	15 No	7.5 No	670 No	<0.04U No	NR	NR	NR	NR	NR
LL5ss-016M-SO	11/15/2004	0.0 - 1.0	LL5ss-016M	11000 No	21 No	5.1 No	450 No	<0.04U No	NR	NR	NR	NR	NR
LL5ss-017M-SO	11/15/2004	0.0 - 1.0	LL5ss-017M	11000 No	18 No	8.9 No	660 No	0.07 No	NR	NR	NR	NR	NR
LL5ss-018M-SO	11/19/2004	0.0 - 1.0	LL5ss-018M	12000 No	19 No	11 No	410 No	0.06 No	0.025J No	0.033 No	0.053 No	<0.032U No	0.025J No
LL5ss-019M-SO	11/12/2004	0.0 - 1.0	LL5ss-019M	13000 No	21 No	9.7 No	410 No	0.04 No	NR	NR	NR	NR	NR
LL5ss-020M-SO	11/15/2004	0.0 - 1.0	LL5ss-020M	12000 No	19 No	10 No	380 No	<0.05U No	NR	NR	NR	NR	NR
LL5ss-021M-SO	11/19/2004	0.0 - 1.0	LL5ss-021M	13000 No	20 No	11 No	380 No	0.03 No	NR	NR	NR	NR	NR
LL5ss-022M-SO	11/12/2004	0.0 - 1.0	LL5ss-022M	12000 No	20 No	11 No	400 No	0.04 No	NR	NR	NR	NR	NR
LL5ss-023M-SO	11/15/2004	0.0 - 1.0	LL5ss-023M	13000 No	19 No	9.1 No	300 No	0.06 No	NR	NR	NR	NR	NR
LL5ss-024M-SO	11/12/2004	0.0 - 1.0	LL5ss-024M	13000 No	22 No	10 No	240 No	0.03 No	NR	NR	NR	NR	NR
LL5ss-025M-SO	11/12/2004	0.0 - 1.0	LL5ss-025M	13000 No	19 No	9.4 No	440 No	0.07 No	NR	NR	NR	NR	NR
LL5ss-026M-SO	11/15/2004	0.0 - 1.0	LL5ss-026M	10000 No	22 No	5.9 No	270 No	<0.04U No	NR	NR	NR	NR	NR
LL5ss-027M-SO	11/15/2004	0.0 - 1.0	LL5ss-027M	12000 No	21 No	9.4 No	450 No	<0.04U No	NR	NR	NR	NR	NR
LL5ss-028M-SO	11/15/2004	0.0 - 1.0	LL5ss-028M	13000 No	21 No	13 No	390 No	<0.04U No	NR	NR	NR	NR	NR
LL5ss-029M-SO	11/15/2004	0.0 - 1.0	LL5ss-029M	11000 No	23 No	13 No	940 No	<0.04U No	NR	NR	NR	NR	NR
LL5ss-031M-SO	8/12/2007	0.0 - 1.0	LL5ss-031M	7130 No	16.6 No	6.6 No	450 No	0.041J No	NR	NR	NR	NR	NR
LL5ss-032M-SO	8/12/2007	0.0 - 1.0	LL5ss-032M	9110 No	23.4 No	8.2 No	481 No	0.14J No	NR	NR	NR	NR	NR
LL5ss-033M-SO	8/12/2007	0.0 - 1.0	LL5ss-033M	9420 No	25.2 No	6.5 No	284 No	0.4J No	<0.33U No	<0.33U No	<0.33U No	<0.33U No	<0.33U No
LL5ss-034M-SO	8/9/2007	0.0 - 1.0	LL5ss-034M	8500 No	17.5 No	7.5 No	617 No	0.019J No	NR	NR	NR	NR	NR
LL5ss-035M-SO	8/12/2007	0.0 - 1.0	LL5ss-035M	8780 No	20.4 No	7.4 No	471 No	0.023J No	NR	NR	NR	NR	NR
LL5ss-036M-SO	8/12/2007	0.0 - 1.0	LL5ss-036M	7220 No	13.3 No	5.6 No	333 No	0.055J No	<0.33U No	<0.33U No	<0.33U No	<0.33U No	<0.33U No
LL5ss-037M-SO	8/14/2007	0.0 - 1.0	LL5ss-037M	9690 No	22.8 No	6.1 No	424 No	0.094J No	NR	NR	NR	NR	NR

Table G-5. COC Screening for Surface Soil (0-1 ft bgs ISM Samples) at Load Line 5 Unrestricted Land Use Receptor: Resident (Adult and Child) (continued)

Sample ID	Date	COPC		Aluminum	Chromium ^c	Cobalt	Manganese	Mercury	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene
		CAS Number		7429-90-5	7440-47-3	7440-48-4	7439-96-5	7439-97-6	56-55-3	50-32-8	205-99-2	53-70-3	193-39-5
		Resident (Adult and Child) FWCUG ^a :											
		HQ=1		73798	81473	1313	2927	22.7	--	--	--	--	--
		Risk=10 ⁻⁵		--	--	8030	--	--	2.21	0.221	2.21	0.221	2.21
		Background Criteria ^b		17700 (19500)	17.4 (27.2)	10.4 (23.2)	1450 (3030)	0.036 (0.044)	--	--	--	--	--
		Depth (ft bgs)	Station	Exceeds FWCUG?	Exceeds FWCUG?	Exceeds FWCUG?	Exceeds FWCUG?	Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?	Result Exceeds FWCUG?
LL5ss-038M-SO	8/12/2007	0.0 - 1.0	LL5ss-038M	8850 No	86.7 No	6.7 No	359 No	<0.029U No	NR	NR	NR	NR	NR
LL5ss-039M-SO	8/12/2007	0.0 - 1.0	LL5ss-039M	8070 No	16.5 No	6.4 No	482 No	0.083J No	NR	NR	NR	NR	NR
LL5ss-040M-SO	8/12/2007	0.0 - 1.0	LL5ss-040M	8800 No	20.3 No	4.5 No	373 No	0.018J No	NR	NR	NR	NR	NR
LL5ss-041M-SO	8/12/2007	0.0 - 1.0	LL5ss-041M	7820 No	17.1 No	4.6 No	276 No	0.03J No	NR	NR	NR	NR	NR
LL5ss-042M-SO	8/9/2007	0.0 - 1.0	LL5ss-042M	8580 No	18.9 No	7.5 No	451 No	0.028J No	1.4 No	<1.3U No	<1.3U No	<1.3U No	<1.3U No
LL5ss-044M-SO	8/9/2007	0.0 - 1.0	LL5ss-044M	8110 No	20.4 No	5.7 No	717 No	0.048J No	NR	NR	NR	NR	NR
LL5ss-045M-SO	8/12/2007	0.0 - 1.0	LL5ss-045M	7090 No	13.7 No	5.2 No	524 No	0.035J No	NR	NR	NR	NR	NR
LL5ss-046M-SO	8/9/2007	0.0 - 1.0	LL5ss-046M	8380 No	23.9 No	6.2 No	497 No	0.099J No	NR	NR	NR	NR	NR
LL5ss-062M-5044-SO	3/3/2010	0.0 - 1.0	LL5ss-062M	12700J No	26.9 No	5.5 No	721 No	0.036J No	<0.027U No	<0.027U No	0.072 No	<0.027U No	<0.027U No
LL5ss-063M-5045-SO	3/3/2010	0.0 - 1.0	LL5ss-063M	11800J No	21.6 No	6.5 No	384 No	0.034J No	0.046 No	0.041 No	0.062 No	<0.0068U No	0.019 No
LL5ss-064M-5046-SO	3/3/2010	0.0 - 1.0	LL5ss-064M	11700J No	33.2 No	5.5 No	1120 No	0.075J No	0.7 No	0.53 Yes	0.78 No	0.092 No	0.26 No
LL5ss-065M-5047-SO	3/3/2010	0.0 - 1.0	LL5ss-065M	11400J No	26.7 No	8.8 No	825 No	0.062J No	0.017J No	0.014J No	0.022J No	<0.0068UJ No	0.0092J No
LL5ss-066M-5048-SO	3/3/2010	0.0 - 1.0	LL5ss-066M	11000J No	22.4 No	10 No	629 No	0.14 No	0.12 No	0.084 No	0.11 No	0.013 No	0.043 No
LL5ss-067M-5049-SO	3/3/2010	0.0 - 1.0	LL5ss-067M	12100J No	21.3 No	8.5 No	382 No	0.036J No	0.041 No	0.029 No	0.05 No	<0.0068U No	0.016 No
LL5ss-068M-5050-SO	3/3/2010	0.0 - 1.0	LL5ss-068M	10800J No	21.1 No	13.3 No	1140 No	0.044J No	0.015 No	0.015 No	0.028 No	<0.0068U No	0.011 No
LL5ss-069M-5051-SO	3/3/2010	0.0 - 1.0	LL5ss-069M	9980J No	21.1 No	8.9 No	565 No	0.039J No	0.72 No	0.5 Yes	0.64 No	0.089J No	0.27 No
LL5ss-070M-5052-SO	3/3/2010	0.0 - 1.0	LL5ss-070M	9540J No	39.6 No	9.8 No	831 No	0.036J No	0.013 No	0.013 No	0.027 No	<0.0068U No	0.0088 No
LL5ss-071M-5053-SO	3/8/2010	0.0 - 1.0	LL5ss-071M	9220J No	19 No	8.5 No	577 No	0.036J No	0.032 No	0.034 No	0.08 No	<0.0068U No	0.019 No
LL5ss-072M-5054-SO	3/8/2010	0.0 - 1.0	LL5ss-072M	10300J No	21.9 No	8.8 No	995 No	0.036J No	0.0098J No	0.0089J No	0.016J No	<0.051UJ No	<0.051UJ No
LL5ss-073M-5055-SO	3/8/2010	0.0 - 1.0	LL5ss-073M	11200J No	21.5 No	8.5 No	655 No	0.054J No	0.019 No	0.019 No	0.034 No	<0.0068U No	0.014 No
LL5ss-074M-5056-SO	3/3/2010	0.0 - 1.0	LL5ss-074M	11000J No	28.1 No	7.2 No	838 No	0.045J No	0.047 No	0.034 No	0.065 No	<0.027U No	<0.027U No
LL5ss-075M-5057-SO	3/3/2010	0.0 - 1.0	LL5ss-075M	9200J No	38.5 No	7.5 No	493 No	0.071J No	0.089 No	0.065 No	0.095 No	<0.027U No	0.034 No
LL5ss-076M-5058-SO	3/3/2010	0.0 - 1.0	LL5ss-076M	9760J No	29 No	9.5 No	420 No	0.043J No	0.046J No	0.031J No	0.048J No	<0.2U No	<0.2U No
LL5ss-077M-5059-SO	3/8/2010	0.0 - 1.0	LL5ss-077M	12200J No	23.5 No	10.5 No	565 No	0.028J No	0.021 No	0.018 No	0.023 No	<0.0068U No	0.011 No

All units are milligrams per kilogram (mg/kg).

^aFacility-Wide Cleanup Goals (FWCUGs) 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).

^cUsing the lines of evidence presented in Section 7.2.4.1, FWCUGs for trivalent chromium were identified as being appropriate for use at Load Line 5.

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

HQ = Hazard Quotient

ISM = Incremental Sampling Method

NR = not reported

Bold = Concentration in sample exceeds FWCUG

-- = No value available

Table G-6. Sum-of-Ratios for Non-Carcinogens: COC Screening for Surface Soil (0-1 ft bgs ISM Samples) at Load Line 5
Unrestricted Land Use Receptor: Resident (Adult and Child)

Sample ID	Date	COPC		Aluminum		Chromium ^c		Cobalt		Manganese		Mercury		Sum of Ratios
		CAS Number		7429-90-5		7440-47-3		7440-48-4		7439-96-5		7439-97-6		
		Resident (Adult and Child) FWCUG ^a :												
		HQ=1		73798		81473		1313		2927		22.7		
		Critical effect or Target Organ		Neurotoxicity in offspring		NOAEL		Not specified		CNS		Nervous System		
		Background Criteria ^b		17700 (19500)		17.4 (27.2)		10.4 (23.2)		1450 (3030)		0.036 (0.044)		
		Depth (ft bgs)	Station	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	
LL5ss-001M-SO	11/12/2004	0.0 - 1.0	LL5ss-001M	11000	NA	33	<0.01	7.2	NA	500	NA	0.09	<0.01	<0.1
LL5ss-002M-SO	11/12/2004	0.0 - 1.0	LL5ss-002M	11000	NA	22	<0.01	6.5	NA	330	NA	0.04	<0.01	<0.1
LL5ss-003M-SO	11/12/2004	0.0 - 1.0	LL5ss-003M	11000	NA	17	NA	6	NA	510	NA	0.06	<0.01	<0.1
LL5ss-004M-SO	11/10/2004	0.0 - 1.0	LL5ss-004M	12000	NA	20	<0.01	8.8	NA	800	NA	0.67	0.03	<0.1
LL5ss-005M-SO	11/19/2004	0.0 - 1.0	LL5ss-005M	18000	0.24	34	<0.01	1.9	NA	3100	1.1	0.09	<0.01	1
LL5ss-006M-SO	11/12/2004	0.0 - 1.0	LL5ss-006M	10000	NA	20	<0.01	8.6	NA	650	NA	<0.04U	--	<0.1
LL5ss-007M-SO	11/12/2004	0.0 - 1.0	LL5ss-007M	10000	NA	27	<0.01	6.2	NA	740	NA	<0.04U	--	<0.1
LL5ss-008M-SO	11/12/2004	0.0 - 1.0	LL5ss-008M	7400	NA	18	<0.01	6	NA	470	NA	<0.04U	--	<0.1
LL5ss-009M-SO	11/15/2004	0.0 - 1.0	LL5ss-009M	11000	NA	24	<0.01	7.4	NA	380	NA	1	0.04	<0.1
LL5ss-010M-SO	11/15/2004	0.0 - 1.0	LL5ss-010M	13000	NA	19	<0.01	7.7	NA	450	NA	1.4	0.06	0.1
LL5ss-011M-SO	11/12/2004	0.0 - 1.0	LL5ss-011M	12000	NA	21	<0.01	7.6	NA	430	NA	0.06	<0.01	<0.1
LL5ss-012M-SO	11/15/2004	0.0 - 1.0	LL5ss-012M	11000	NA	19	<0.01	7.3	NA	410	NA	3	0.13	0.1
LL5ss-013M-SO	11/15/2004	0.0 - 1.0	LL5ss-013M	8300	NA	16	NA	6	NA	660	NA	0.05	<0.01	<0.1
LL5ss-014M-SO	11/15/2004	0.0 - 1.0	LL5ss-014M	8300	NA	16	NA	6.8	NA	460	NA	<0.03U	--	<0.1
LL5ss-015M-SO	11/15/2004	0.0 - 1.0	LL5ss-015M	8000	NA	15	NA	7.5	NA	670	NA	<0.04U	--	<0.1
LL5ss-016M-SO	11/15/2004	0.0 - 1.0	LL5ss-016M	11000	NA	21	<0.01	5.1	NA	450	NA	<0.04U	--	<0.1
LL5ss-017M-SO	11/15/2004	0.0 - 1.0	LL5ss-017M	11000	NA	18	<0.01	8.9	NA	660	NA	0.07	<0.01	<0.1
LL5ss-018M-SO	11/19/2004	0.0 - 1.0	LL5ss-018M	12000	NA	19	<0.01	11	0.01	410	NA	0.06	<0.01	<0.1
LL5ss-019M-SO	11/12/2004	0.0 - 1.0	LL5ss-019M	13000	NA	21	<0.01	9.7	NA	410	NA	0.04	<0.01	<0.1
LL5ss-020M-SO	11/15/2004	0.0 - 1.0	LL5ss-020M	12000	NA	19	<0.01	10	NA	380	NA	<0.05U	--	<0.1
LL5ss-021M-SO	11/19/2004	0.0 - 1.0	LL5ss-021M	13000	NA	20	<0.01	11	0.01	380	NA	0.03	NA	<0.1
LL5ss-022M-SO	11/12/2004	0.0 - 1.0	LL5ss-022M	12000	NA	20	<0.01	11	0.01	400	NA	0.04	<0.01	<0.1
LL5ss-023M-SO	11/15/2004	0.0 - 1.0	LL5ss-023M	13000	NA	19	<0.01	9.1	NA	300	NA	0.06	<0.01	<0.1
LL5ss-024M-SO	11/12/2004	0.0 - 1.0	LL5ss-024M	13000	NA	22	<0.01	10	NA	240	NA	0.03	NA	<0.1
LL5ss-025M-SO	11/12/2004	0.0 - 1.0	LL5ss-025M	13000	NA	19	<0.01	9.4	NA	440	NA	0.07	<0.01	<0.1
LL5ss-026M-SO	11/15/2004	0.0 - 1.0	LL5ss-026M	10000	NA	22	<0.01	5.9	NA	270	NA	<0.04U	--	<0.1
LL5ss-027M-SO	11/15/2004	0.0 - 1.0	LL5ss-027M	12000	NA	21	<0.01	9.4	NA	450	NA	<0.04U	--	<0.1
LL5ss-028M-SO	11/15/2004	0.0 - 1.0	LL5ss-028M	13000	NA	21	<0.01	13	0.01	390	NA	<0.04U	--	<0.1
LL5ss-029M-SO	11/15/2004	0.0 - 1.0	LL5ss-029M	11000	NA	23	<0.01	13	0.01	940	NA	<0.04U	--	<0.1
LL5ss-031M-SO	8/12/2007	0.0 - 1.0	LL5ss-031M	7130	NA	16.6	NA	6.6	NA	450	NA	0.041	<0.01	<0.1
LL5ss-032M-SO	8/12/2007	0.0 - 1.0	LL5ss-032M	9110	NA	23.4	<0.01	8.2	NA	481	NA	0.14	0.01	<0.1
LL5ss-033M-SO	8/12/2007	0.0 - 1.0	LL5ss-033M	9420	NA	25.2	<0.01	6.5	NA	284	NA	0.4	0.02	<0.1
LL5ss-034M-SO	8/9/2007	0.0 - 1.0	LL5ss-034M	8500	NA	17.5	<0.01	7.5	NA	617	NA	0.019	NA	<0.1
LL5ss-035M-SO	8/12/2007	0.0 - 1.0	LL5ss-035M	8780	NA	20.4	<0.01	7.4	NA	471	NA	0.023	NA	<0.1
LL5ss-036M-SO	8/12/2007	0.0 - 1.0	LL5ss-036M	7220	NA	13.3	NA	5.6	NA	333	NA	0.055	<0.01	<0.1
LL5ss-037M-SO	8/14/2007	0.0 - 1.0	LL5ss-037M	9690	NA	22.8	<0.01	6.1	NA	424	NA	0.094	<0.01	<0.1
LL5ss-038M-SO	8/12/2007	0.0 - 1.0	LL5ss-038M	8850	NA	86.7	<0.01	6.7	NA	359	NA	<0.029U	--	<0.1
LL5ss-039M-SO	8/12/2007	0.0 - 1.0	LL5ss-039M	8070	NA	16.5	<0.01	6.4	NA	482	NA	0.083	<0.01	<0.1
LL5ss-040M-SO	8/12/2007	0.0 - 1.0	LL5ss-040M	8800	NA	20.3	<0.01	4.5	NA	373	NA	0.018	NA	<0.1
LL5ss-041M-SO	8/12/2007	0.0 - 1.0	LL5ss-041M	7820	NA	17.1	<0.01	4.6	NA	276	NA	0.03	NA	<0.1
LL5ss-042M-SO	8/9/2007	0.0 - 1.0	LL5ss-042M	8580	NA	18.9	<0.01	7.5	NA	451	NA	0.028	NA	<0.1
LL5ss-044M-SO	8/9/2007	0.0 - 1.0	LL5ss-044M	8110	NA	20.4	<0.01	5.7	NA	717	NA	0.048	<0.01	<0.1
LL5ss-045M-SO	8/12/2007	0.0 - 1.0	LL5ss-045M	7090	NA	13.7	<0.01	5.2	NA	524	NA	0.035	NA	<0.1

Table G-6. Sum-of-Ratios for Non-Carcinogens: COC Screening for Surface Soil (0-1 ft bgs ISM Samples) at Load Line 5
Unrestricted Land Use Receptor: Resident (Adult and Child) (continued)

Sample ID	Date	COPC		Aluminum		Chromium ^c		Cobalt		Manganese		Mercury		Sum of Ratios
		CAS Number		7429-90-5		7440-47-3		7440-48-4		7439-96-5		7439-97-6		
		Resident (Adult and Child) FWCUG ^a :												
		HQ=1		73798		81473		1313		2927		22.7		
		Critical effect or Target Organ		Neurotoxicity in offspring		NOAEL		Not specified		CNS		Nervous System		
		Background Criteria ^b		17700 (19500)		17.4 (27.2)		10.4 (23.2)		1450 (3030)		0.036 (0.044)		
		Depth (ft bgs)	Station	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	
LL5ss-046M-SO	8/9/2007	0.0 - 1.0	LL5ss-046M	8380	NA	23.9	<0.01	6.2	NA	497	NA	0.099	<0.01	<0.1
LL5ss-062M-5044-SO	3/3/2010	0.0 - 1.0	LL5ss-062M	12700	NA	26.9	<0.01	5.5	NA	721	NA	0.036	NA	<0.1
LL5ss-063M-5045-SO	3/3/2010	0.0 - 1.0	LL5ss-063M	11800	NA	21.6	<0.01	6.5	NA	384	NA	0.034	NA	<0.1
LL5ss-064M-5046-SO	3/3/2010	0.0 - 1.0	LL5ss-064M	11700	NA	33.2	<0.01	5.5	NA	1120	NA	0.075	<0.01	<0.1
LL5ss-065M-5047-SO	3/3/2010	0.0 - 1.0	LL5ss-065M	11400	NA	26.7	<0.01	8.8	NA	825	NA	0.062	<0.01	<0.1
LL5ss-066M-5048-SO	3/3/2010	0.0 - 1.0	LL5ss-066M	11000	NA	22.4	<0.01	10	NA	629	NA	0.14	0.01	<0.1
LL5ss-067M-5049-SO	3/3/2010	0.0 - 1.0	LL5ss-067M	12100	NA	21.3	<0.01	8.5	NA	382	NA	0.036	NA	<0.1
LL5ss-068M-5050-SO	3/3/2010	0.0 - 1.0	LL5ss-068M	10800	NA	21.1	<0.01	13.3	0.01	1140	NA	0.044	<0.01	<0.1
LL5ss-069M-5051-SO	3/3/2010	0.0 - 1.0	LL5ss-069M	9980	NA	21.1	<0.01	8.9	NA	565	NA	0.039	<0.01	<0.1
LL5ss-070M-5052-SO	3/3/2010	0.0 - 1.0	LL5ss-070M	9540	NA	39.6	<0.01	9.8	NA	831	NA	0.036	NA	<0.1
LL5ss-071M-5053-SO	3/8/2010	0.0 - 1.0	LL5ss-071M	9220	NA	19	<0.01	8.5	NA	577	NA	0.036	NA	<0.1
LL5ss-072M-5054-SO	3/8/2010	0.0 - 1.0	LL5ss-072M	10300	NA	21.9	<0.01	8.8	NA	995	NA	0.036	NA	<0.1
LL5ss-073M-5055-SO	3/8/2010	0.0 - 1.0	LL5ss-073M	11200	NA	21.5	<0.01	8.5	NA	655	NA	0.054	<0.01	<0.1
LL5ss-074M-5056-SO	3/3/2010	0.0 - 1.0	LL5ss-074M	11000	NA	28.1	<0.01	7.2	NA	838	NA	0.045	<0.01	<0.1
LL5ss-075M-5057-SO	3/3/2010	0.0 - 1.0	LL5ss-075M	9200	NA	38.5	<0.01	7.5	NA	493	NA	0.071	<0.01	<0.1
LL5ss-076M-5058-SO	3/3/2010	0.0 - 1.0	LL5ss-076M	9760	NA	29	<0.01	9.5	NA	420	NA	0.043	<0.01	<0.1
LL5ss-077M-5059-SO	3/8/2010	0.0 - 1.0	LL5ss-077M	12200	NA	23.5	<0.01	10.5	0.01	565	NA	0.028	NA	<0.1

All units are milligrams per kilogram (mg/kg).

^aFacility-Wide Cleanup Goals (FWCUGs) 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).

^cUsing the lines of evidence presented in Section 7.2.4.1, FWCUGs for trivalent chromium were identified as being appropriate for use at Load Line 5.

Data Qualifiers:

U = not detected

bgs = below ground surface

CAS = Chemical Abstract Service

COPC = Chemical of Potential Concern

COC = Chemical of Concern

HQ = Hazard Quotient

ISM = Incremental Sampling Method

NA = Not applicable, the COPC result for this sample is not included in the SOR because the reported concentration is less than the background criteria.

Bold = SOR greater than 1

-- = No value available

Table G-7. Sum-of-Ratios for Carcinogens: COC Screening for Surface Soil (0-1 ft bgs ISM Samples) at Load Line 5
Unrestricted Land Use Receptor: Resident (Adult and Child)

Sample ID	Date	COPC		Cobalt		Benz(a)anthracene		Benzo(a)pyrene		Benzo(b)fluoranthene		Dibenz(a,h)anthracene		Indeno(1,2,3-cd)pyrene		Sum of Ratios
		CAS Number		7440-48-4		56-55-3		50-32-8		205-99-2		53-70-3		193-39-5		
		Resident (Adult and Child) FWCUG ^a :														
		Risk=10 ⁻⁵		8030		2.21		0.221		2.21		0.221		2.21		
		Background Criteria ^b		10.4 (23.2)		--		--		--		--		--		
Depth (ft bgs)	Station	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	
LL5ss-001M-SO	11/12/2004	0.0 - 1.0	LL5ss-001M	7.2	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-002M-SO	11/12/2004	0.0 - 1.0	LL5ss-002M	6.5	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-003M-SO	11/12/2004	0.0 - 1.0	LL5ss-003M	6	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-004M-SO	11/10/2004	0.0 - 1.0	LL5ss-004M	8.8	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-005M-SO	11/19/2004	0.0 - 1.0	LL5ss-005M	1.9	NA	0.12	0.05	0.15	0.68	0.19	0.09	0.024	0.11	0.09	0.04	1
LL5ss-006M-SO	11/12/2004	0.0 - 1.0	LL5ss-006M	8.6	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-007M-SO	11/12/2004	0.0 - 1.0	LL5ss-007M	6.2	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-008M-SO	11/12/2004	0.0 - 1.0	LL5ss-008M	6	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-009M-SO	11/15/2004	0.0 - 1.0	LL5ss-009M	7.4	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-010M-SO	11/15/2004	0.0 - 1.0	LL5ss-010M	7.7	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-011M-SO	11/12/2004	0.0 - 1.0	LL5ss-011M	7.6	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-012M-SO	11/15/2004	0.0 - 1.0	LL5ss-012M	7.3	NA	0.19	0.09	0.15	0.68	0.19	0.09	0.019	0.09	0.072	0.03	1
LL5ss-013M-SO	11/15/2004	0.0 - 1.0	LL5ss-013M	6	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-014M-SO	11/15/2004	0.0 - 1.0	LL5ss-014M	6.8	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-015M-SO	11/15/2004	0.0 - 1.0	LL5ss-015M	7.5	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-016M-SO	11/15/2004	0.0 - 1.0	LL5ss-016M	5.1	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-017M-SO	11/15/2004	0.0 - 1.0	LL5ss-017M	8.9	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-018M-SO	11/19/2004	0.0 - 1.0	LL5ss-018M	11	NA	0.025	--	0.033	--	0.053	--	<0.032U	--	0.025	--	--
LL5ss-019M-SO	11/12/2004	0.0 - 1.0	LL5ss-019M	9.7	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-020M-SO	11/15/2004	0.0 - 1.0	LL5ss-020M	10	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-021M-SO	11/19/2004	0.0 - 1.0	LL5ss-021M	11	<0.01	NR	--	NR	--	NR	--	NR	--	NR	--	<0.1
LL5ss-022M-SO	11/12/2004	0.0 - 1.0	LL5ss-022M	11	<0.01	NR	--	NR	--	NR	--	NR	--	NR	--	<0.1
LL5ss-023M-SO	11/15/2004	0.0 - 1.0	LL5ss-023M	9.1	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-024M-SO	11/12/2004	0.0 - 1.0	LL5ss-024M	10	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-025M-SO	11/12/2004	0.0 - 1.0	LL5ss-025M	9.4	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-026M-SO	11/15/2004	0.0 - 1.0	LL5ss-026M	5.9	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-027M-SO	11/15/2004	0.0 - 1.0	LL5ss-027M	9.4	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-028M-SO	11/15/2004	0.0 - 1.0	LL5ss-028M	13	<0.01	NR	--	NR	--	NR	--	NR	--	NR	--	<0.1
LL5ss-029M-SO	11/15/2004	0.0 - 1.0	LL5ss-029M	13	<0.01	NR	--	NR	--	NR	--	NR	--	NR	--	<0.1
LL5ss-031M-SO	8/12/2007	0.0 - 1.0	LL5ss-031M	6.6	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-032M-SO	8/12/2007	0.0 - 1.0	LL5ss-032M	8.2	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-033M-SO	8/12/2007	0.0 - 1.0	LL5ss-033M	6.5	NA	<0.33U	--	<0.33U	--	<0.33U	--	<0.33U	--	<0.33U	--	--
LL5ss-034M-SO	8/9/2007	0.0 - 1.0	LL5ss-034M	7.5	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-035M-SO	8/12/2007	0.0 - 1.0	LL5ss-035M	7.4	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-036M-SO	8/12/2007	0.0 - 1.0	LL5ss-036M	5.6	NA	<0.33U	--	<0.33U	--	<0.33U	--	<0.33U	--	<0.33U	--	--
LL5ss-037M-SO	8/14/2007	0.0 - 1.0	LL5ss-037M	6.1	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-038M-SO	8/12/2007	0.0 - 1.0	LL5ss-038M	6.7	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-039M-SO	8/12/2007	0.0 - 1.0	LL5ss-039M	6.4	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-040M-SO	8/12/2007	0.0 - 1.0	LL5ss-040M	4.5	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-041M-SO	8/12/2007	0.0 - 1.0	LL5ss-041M	4.6	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-042M-SO	8/9/2007	0.0 - 1.0	LL5ss-042M	7.5	NA	1.4	0.63	<1.3U	--	<1.3U	--	<1.3U	--	<1.3U	--	0.6
LL5ss-044M-SO	8/9/2007	0.0 - 1.0	LL5ss-044M	5.7	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-045M-SO	8/12/2007	0.0 - 1.0	LL5ss-045M	5.2	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--
LL5ss-046M-SO	8/9/2007	0.0 - 1.0	LL5ss-046M	6.2	NA	NR	--	NR	--	NR	--	NR	--	NR	--	--

Table G-7. Sum-of-Ratios for Carcinogens: COC Screening for Surface Soil (0-1 ft bgs ISM Samples) at Load Line 5
Unrestricted Land Use Receptor: Resident (Adult and Child) (continued)

Sample ID	Date	Analyte (mg/kg)		Cobalt		Benz(a)anthracene		Benzo(a)pyrene		Benzo(b)fluoranthene		Dibenz(a,h)anthracene		Indeno(1,2,3-cd)pyrene		Sum of Ratios
		CAS Number		7440-48-4		56-55-3		50-32-8		205-99-2		53-70-3		193-39-5		
		Resident FWCUG ^a :														
		Risk=10 ⁻⁵		8030		2.21		0.221		2.21		0.221		2.21		
		Background Criteria ^b		10.4 (23.2)		--		--		--		--		--		
		Depth (ft bgs)	Station	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	Result	Ratio	
LL5ss-062M-5044-SO	3/3/2010	0.0 - 1.0	LL5ss-062M	5.5	NA	<0.027U	--	<0.027U	--	0.072	0.03	<0.027U	--	<0.027U	--	<0.1
LL5ss-063M-5045-SO	3/3/2010	0.0 - 1.0	LL5ss-063M	6.5	NA	0.046	0.02	0.041	0.19	0.062	0.03	<0.0068U	--	0.019	0.01	0.2
LL5ss-064M-5046-SO	3/3/2010	0.0 - 1.0	LL5ss-064M	5.5	NA	0.7	0.32	0.53	2.4	0.78	0.35	0.092	0.42	0.26	0.12	4
LL5ss-065M-5047-SO	3/3/2010	0.0 - 1.0	LL5ss-065M	8.8	NA	0.017	0.01	0.014	0.06	0.022	0.01	<0.0068U	--	0.0092	<0.01	0.1
LL5ss-066M-5048-SO	3/3/2010	0.0 - 1.0	LL5ss-066M	10	NA	0.12	0.05	0.084	0.38	0.11	0.05	0.013	0.06	0.043	0.02	0.6
LL5ss-067M-5049-SO	3/3/2010	0.0 - 1.0	LL5ss-067M	8.5	NA	0.041	0.02	0.029	0.13	0.05	0.02	<0.0068U	--	0.016	0.01	0.2
LL5ss-068M-5050-SO	3/3/2010	0.0 - 1.0	LL5ss-068M	13.3	<0.01	0.015	0.01	0.015	0.07	0.028	0.01	<0.0068U	--	0.011	<0.01	0.1
LL5ss-069M-5051-SO	3/3/2010	0.0 - 1.0	LL5ss-069M	8.9	NA	0.72	0.33	0.5	2.3	0.64	0.29	0.089	0.40	0.27	0.12	3
LL5ss-070M-5052-SO	3/3/2010	0.0 - 1.0	LL5ss-070M	9.8	NA	0.013	0.01	0.013	0.06	0.027	0.01	<0.0068U	--	0.0088	<0.01	0.1
LL5ss-071M-5053-SO	3/8/2010	0.0 - 1.0	LL5ss-071M	8.5	NA	0.032	0.01	0.034	0.15	0.08	0.04	<0.0068U	--	0.019	0.01	0.2
LL5ss-072M-5054-SO	3/8/2010	0.0 - 1.0	LL5ss-072M	8.8	NA	0.0098	<0.01	0.0089	0.04	0.016	0.01	<0.051U	--	<0.051U	--	0.0
LL5ss-073M-5055-SO	3/8/2010	0.0 - 1.0	LL5ss-073M	8.5	NA	0.019	0.01	0.019	0.09	0.034	0.02	<0.0068U	--	0.014	0.01	0.1
LL5ss-074M-5056-SO	3/3/2010	0.0 - 1.0	LL5ss-074M	7.2	NA	0.047	0.02	0.034	0.15	0.065	0.03	<0.027U	--	<0.027U	--	0.2
LL5ss-075M-5057-SO	3/3/2010	0.0 - 1.0	LL5ss-075M	7.5	NA	0.089	0.04	0.065	0.29	0.095	0.04	<0.027U	--	0.034	0.02	0.4
LL5ss-076M-5058-SO	3/3/2010	0.0 - 1.0	LL5ss-076M	9.5	NA	0.046	0.02	0.031	0.14	0.048	0.02	<0.2U	--	<0.2U	--	0.2
LL5ss-077M-5059-SO	3/8/2010	0.0 - 1.0	LL5ss-077M	10.5	<0.01	0.021	0.01	0.018	0.08	0.023	0.01	<0.0068U	--	0.011	<0.01	0.1

All units are milligrams per kilogram (mg/kg).

^aFacility-Wide Cleanup Goals (FWCUGs) 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*

Data Qualifiers:

U = not detected

bgs = below ground surface

CAS = Chemical Abstract Service

COC = Chemical of Concern

ISM = Incremental Sampling Method

NA = not applicable, the cobalt result for this sample is not included in the SOR because the reported concentration is less than the background criteria.

NR = not reported

SOR = Sum-of-ratios

Bold = SOR greater than 1

-- = No value available

Table G-8. Percent Contribution to Sum-of-Ratios for Carcinogens: COC Screening for Surface Soil (0-1 ft bgs ISM Samples) at Load Line 5

Sample ID	Date	COPC		Cobalt		Benz(a)anthracene		Benzo(a)pyrene		Benzo(b)fluoranthene		Dibenz(a,h)anthracene		Indeno(1,2,3-cd)pyrene		SOR						
		CAS Number		7440-48-4		56-55-3		50-32-8		205-99-2		53-70-3		193-39-5								
		Resident FWCUG ^a :																				
		Risk=10 ⁻⁵		8030		Percent Contributio n to SOR>1	2.21		Percent Contributio n to SOR>1	0.221		Percent Contributio n to SOR>1	2.21		Percent Contributio n to SOR>1		0.221		Percent Contributio n to SOR>1	2.21		Percent Contributio n to SOR>1
		Background Criteria ^b		10.4 (23.2)			--			--			--				--			--		
		Depth (ft bgs)	Station	Result	Ratio		Result	Ratio		Result	Ratio		Result	Ratio			Result	Ratio		Result	Ratio	
LL5ss-064M-5046-SC	3/3/2010	0.0 - 1.0	LL5ss-064M	5.5	NA	--	0.7	0.32	9%	0.53	2.4	67%	0.78	0.4	10%	0.092	0.4	12%	0.26	0.1	3%	4
LL5ss-069M-5051-SC	3/3/2010	0.0 - 1.0	LL5ss-069M	8.9	NA	--	0.72	0.33	10%	0.5	2.3	66%	0.64	0.3	9%	0.089	0.4	12%	0.27	0.1	4%	3

All units are milligrams per kilogram (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 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*

bgs = below ground surface

CAS = Chemical Abstract Service

COC = Chemical of Concern

ISM = Incremental Sampling Method

NA = Not applicable, the cobalt result for this sample is not included in the SOR because the reported concentration is less than background

SOR = Sum-of-Ratios

Bold = SOR greater than 1

-- = No value available

**Table G-9. COC Screening for Sediment Samples at the Load Line 5 Wetland
Unrestricted Land Use Receptor: Resident (Adult and Child)**

			COPC	Aluminum
			CAS Number	7429-90-5
			Resident (Adult and Child) FWCUG^a:	
			HQ=1	73798
			Risk=10⁻⁵	--
			Background Criteria^b	13900
Sample ID	Date	Depth (ft)	Station	Result Exceeds FWCUG?
LL5sd-078-5797-SD	4/13/2010	0.0 - 0.5	LL5sd-078	14900 No

All units are milligrams per kilogram (mg/kg).

^aFacility-Wide Cleanup Goals (FWCUGs) from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

^bBackground 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).

CAS = Chemical Abstract Service

COPC = Chemical of Potential Concern

COC = Chemical of Concern

HQ = Hazard Quotient

RC = Resident Child

-- = No value available

Bold = Concentration in this sample exceeds FWCUG

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