# 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 Discrete Samples) at Load Line 11**

| 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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Former Production Area** | | | | | | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | | | | | | |
| **Aluminum** | **7429-90-5** | **47/ 47** | **789** | **23800** | **11400** | **17700** | **Yes** | **Exceeds background** | **52923** | **7380** | **3496** | **3496** | **NGT** | **Yes** | **Exceeds screening level** | **LL11cs-025** | **3/21/2001** |
| Antimony | 7440-36-0 | 35/ 47 | 0.08 | 0.63 | 0.306 | 0.96 | No | Below background | 13.6 | 2.82 | 175 | 2.82 | RC | No | Below background | LL11sd-026 | 11/16/2000 |
| **Arsenic** | **7440-38-2** | **47/ 47** | **2.7** | **30.2** | **13.2** | **15.4** | **Yes** | **Exceeds background** | **0.425** | **0.524** | **2.78** | **0.425** | **RA** | **Yes** | **Exceeds screening level** | **LL11ss-022** | **11/9/2000** |
| Barium | 7440-39-3 | 47/ 47 | 14.6 | 107 | 61 | 88.4 | Yes | Exceeds background | 8966 | 1413 | 351 | 351 | NGT | No | Below risk screening criteria | LL11ss-013 | 11/8/2000 |
| Beryllium | 7440-41-7 | 47/ 47 | 0.13 | 1.1 | 0.587 | 0.88 | Yes | Exceeds background | -- | -- | -- | 16 | RSL | No | Below risk screening criteria | LL11cs-025 | 3/21/2001 |
| Cadmium | 7440-43-9 | 26/ 47 | 0.053 | 1.3 | 0.215 | 0 | Yes | Exceeds background | 22.3 | 6.41 | 10.9 | 6.41 | RC | No | Below risk screening criteria | LL11ss-015 | 11/8/2000 |
| Calcium | 7440-70-2 | 47/ 47 | 830 | 64400 | 6500 | 15800 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11ss-014 | 11/6/2000 |
| **Chromium[d]** | **7440-47-3** | **47/ 47** | **3.5** | **28.4** | **14.6** | **17.4** | **Yes** | **Exceeds background** | **90.4** | **19.9** | **1.64** | **1.64** | **NGT** | **Yes** | **Exceeds screening level** | **LL11cs-011** | **3/23/2001** |
| **Cobalt** | **7440-48-4** | **47/ 47** | **2.2** | **33.8** | **8.54** | **10.4** | **Yes** | **Exceeds background** | **803** | **131** | **7.03** | **7.03** | **NGT** | **Yes** | **Exceeds screening level** | **LL11sd-025** | **11/16/2000** |
| Copper | 7440-50-8 | 47/ 47 | 2.7 | 45.7 | 18 | 17.7 | Yes | Exceeds background | 2714 | 311 | 25368 | 311 | RC | No | Below risk screening criteria | LL11ss-015 | 11/8/2000 |
| **Cyanide** | **57-12-5** | **3/ 34** | **0.58** | **1.6** | **0.301** | **0** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **0.27** | **RSL** | **Yes** | **Exceeds screening level** | **LL11ss-014** | **11/6/2000** |
| Iron | 7439-89-6 | 47/ 47 | 11400 | 38300 | 21600 | 23100 | No | Essential Nutrient | 19010 | 2313 | 184370 | 180000 | RDA | No | Essential Nutrient | LL11cs-011 | 3/23/2001 |
| Lead | 7439-92-1 | 47/ 47 | 3.9 | 102 | 29.6 | 26.1 | Yes | Exceeds background | -- | -- | -- | 400 | RSL | No | Below risk screening criteria | LL11cs-006 | 3/21/2001 |
| Magnesium | 7439-95-4 | 47/ 47 | 121 | 5390 | 2790 | 3030 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11ss-014 | 11/6/2000 |
| **Manganese** | **7439-96-5** | **47/ 47** | **63.9** | **1540** | **511** | **1450** | **Yes** | **Exceeds background** | **1482** | **293** | **35.1** | **35.1** | **NGT** | **Yes** | **Exceeds screening level** | **LL11ss-018** | **11/9/2000** |
| Mercury | 7439-97-6 | 17/ 47 | 0.018 | 0.34 | 0.0397 | 0.036 | Yes | Exceeds background | 16.5 | 2.27 | 172 | 2.27 | RC | No | Below risk screening criteria | LL11ss-013 | 11/8/2000 |
| Nickel | 7440-02-0 | 47/ 47 | 4.5 | 33.2 | 16.4 | 21.1 | Yes | Exceeds background | 1346 | 155 | 12639 | 155 | RC | No | Below risk screening criteria | LL11cs-025 | 3/21/2001 |
| Nitrate | 14797-55-8 | 7/ 34 | 0.92 | 3.2 | 0.834 | -- | Yes | Exceeds background | 114196 | 12487 | 1E+06 | 12487 | RC | No | Below risk screening criteria | LL11ss-001 | 11/7/2000 |
| Potassium | 7440-09-7 | 47/ 47 | 232 | 2910 | 1260 | 927 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11cs-011 | 3/23/2001 |
| Selenium | 7782-49-2 | 19/ 47 | 0.25 | 1.3 | 0.48 | 1.4 | No | Below background | -- | -- | -- | 39 | RSL | No | Below background | LL11cs-025 | 3/21/2001 |
| Silver | 7440-22-4 | 2/ 47 | 0.0046 | 0.023 | 0.181 | 0 | No | <5% Detected | 324 | 38.6 | 3105 | 38.6 | RC | No | <5% Detected | LL11sb-061 | 3/17/2010 |
| Sodium | 7440-23-5 | 42/ 47 | 21.9 | 943 | 471 | 123 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11cs-011 | 3/23/2001 |
| **Sulfide** | **18496-25-8** | **22/ 34** | **29.9** | **244** | **49.3** | **--** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **--** | **--** | **Yes** | **Detected and no screening level** | **LL11ss-001** | **11/7/2000** |
| Thallium | 7440-28-0 | 16/ 47 | 0.13 | 0.26 | 0.124 | 0 | Yes | Exceeds background | 4.76 | 0.612 | 47.7 | 0.612 | RC | No | Below risk screening criteria | LL11sb-021 | 8/21/2000 |
| Vanadium | 7440-62-2 | 47/ 47 | 2.9 | 38.8 | 20.1 | 31.1 | Yes | Exceeds background | 156 | 44.9 | 2304 | 44.9 | RC | No | Below risk screening criteria | LL11cs-011 | 3/23/2001 |
| Zinc | 7440-66-6 | 47/ 47 | 20.9 | 465 | 77.3 | 61.8 | Yes | Exceeds background | 19659 | 2321 | 187269 | 2321 | RC | No | Below risk screening criteria | LL11cs-025 | 3/21/2001 |
| ***Explosives*** | | | | | | | | | | | | | | | | | |
| Nitrocellulose | 9004-70-0 | 4/ 4 | 0.89 | 1.1 | 0.985 | -- | Yes | Detected organic | -- | -- | -- | 19000000 | RSL | No | Below risk screening criteria | LL11ss-009 | 11/8/2000 |
| Nitroguanidine | 556-88-7 | 1/ 4 | 0.077 | 0.077 | 0.132 | -- | Yes | Detected organic | -- | -- | -- | 630 | RSL | No | Below risk screening criteria | LL11ss-001 | 11/7/2000 |
| PETN | 78-11-5 | 1/ 7 | 0.049 | 0.049 | 0.216 | -- | Yes | Detected organic | -- | -- | -- | 13 | RSL | No | Below risk screening criteria | LL11sb-061 | 3/17/2010 |
| Tetryl | 479-45-8 | 1/ 41 | 0.02 | 0.02 | 0.101 | -- | Yes | Detected organic | -- | -- | -- | 16 | RSL | No | Below risk screening criteria | LL11sb-061 | 3/17/2010 |
| ***Pesticide/PCBs*** | | | | | | | | | | | | | | | | | |
| **PCB-1254** | **11097-69-1** | **4/ 12** | **0.02** | **0.42** | **0.0562** | **--** | **Yes** | **Detected organic** | **0.203** | **0.12** | **3.46** | **0.12** | **RC** | **Yes** | **Exceeds screening level** | **LL11sb-061** | **3/17/2010** |

**Table G-1. SRC and COPC Screening for Surface Soil (0-1 ft bgs Discrete Samples) at Load Line 11 (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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | 2/ 14 | 0.033 | 0.081 | 0.114 | -- | Yes | Detected organic | -- | -- | -- | 360 | RSL | No | Below risk screening criteria | LL11sb-061 | 3/17/2010 |
| Acenaphthylene[e] | 208-96-8 | 1/ 14 | 0.012 | 0.012 | 0.107 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sb-060 | 3/18/2010 |
| Anthracene | 120-12-7 | 2/ 14 | 0.049 | 0.16 | 0.121 | -- | Yes | Detected organic | -- | -- | -- | 1800 | RSL | No | Below risk screening criteria | LL11sb-061 | 3/17/2010 |
| **Benz(a)anthracene** | **56-55-3** | **7/ 14** | **0.0089** | **0.37** | **0.147** | **--** | **Yes** | **Detected organic** | **0.221** | **0.65** | **4.77** | **0.221** | **RA** | **Yes** | **Exceeds screening level** | **LL11sb-060** | **3/18/2010** |
| **Benzo(a)pyrene** | **50-32-8** | **7/ 14** | **0.0091** | **0.45** | **0.151** | **--** | **Yes** | **Detected organic** | **0.022** | **0.065** | **0.477** | **0.022** | **RA** | **Yes** | **Exceeds screening level** | **LL11sb-060** | **3/18/2010** |
| **Benzo(b)fluoranthene** | **205-99-2** | **6/ 14** | **0.011** | **0.56** | **0.188** | **--** | **Yes** | **Detected organic** | **0.221** | **0.65** | **4.77** | **0.221** | **RA** | **Yes** | **Exceeds screening level** | **LL11sb-060** | **3/18/2010** |
| Benzo(ghi)perylene[e] | 191-24-2 | 4/ 14 | 0.012 | 0.32 | 0.145 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sb-060 | 3/18/2010 |
| Benzo(k)fluoranthene | 207-08-9 | 2/ 14 | 0.17 | 0.37 | 0.145 | -- | Yes | Detected organic | 2.21 | 6.5 | 47.7 | 2.21 | RA | No | Below risk screening criteria | LL11sb-060 | 3/18/2010 |
| Chrysene | 218-01-9 | 8/ 14 | 0.0097 | 0.47 | 0.153 | -- | Yes | Detected organic | 22.1 | 65 | 477 | 22.1 | RA | No | Below risk screening criteria | LL11sb-060 | 3/18/2010 |
| **Dibenz(a,h)anthracene** | **53-70-3** | **3/ 14** | **0.022** | **0.076** | **0.118** | **--** | **Yes** | **Detected organic** | **0.022** | **0.065** | **0.477** | **0.022** | **RA** | **Yes** | **Exceeds screening level** | **LL11sb-060** | **3/18/2010** |
| Fluoranthene | 206-44-0 | 11/ 14 | 0.0093 | 1 | 0.277 | -- | Yes | Detected organic | 276 | 163 | 5087 | 163 | RC | No | Below risk screening criteria | LL11sb-060 | 3/18/2010 |
| Fluorene | 86-73-7 | 2/ 14 | 0.025 | 0.079 | 0.114 | -- | Yes | Detected organic | 737 | 243 | 11458 | 243 | RC | No | Below risk screening criteria | LL11sb-061 | 3/17/2010 |
| **Indeno(1,2,3-cd)pyrene** | **193-39-5** | **4/ 14** | **0.021** | **0.27** | **0.142** | **--** | **Yes** | **Detected organic** | **0.221** | **0.65** | **4.77** | **0.221** | **RA** | **Yes** | **Exceeds screening level** | **LL11cs-020** | **3/23/2001** |
| Naphthalene | 91-20-3 | 3/ 14 | 0.0089 | 0.017 | 0.108 | -- | Yes | Detected organic | 368 | 122 | 1541 | 122 | RC | No | Below risk screening criteria | LL11sb-061 | 3/17/2010 |
| Phenanthrene[e] | 85-01-8 | 5/ 14 | 0.012 | 0.62 | 0.172 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sb-061 | 3/17/2010 |
| Pyrene | 129-00-0 | 8/ 14 | 0.011 | 0.83 | 0.255 | -- | Yes | Detected organic | 207 | 122 | 3815 | 122 | RC | No | Below risk screening criteria | LL11sb-060 | 3/18/2010 |
| ***Volatile Organic Compounds*** | | | | | | | | | | | | | | | | | |
| Acetone | 67-64-1 | 1/ 10 | 0.008 | 0.008 | 0.0037 | -- | Yes | Detected organic | -- | -- | -- | 6100 | RSL | No | Below risk screening criteria | LL11cs-006 | 3/21/2001 |
| **Non-Production Area** | | | | | | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | 30/ 30 | 6170 | 14400 | 10300 | 17700 | No | Below background | 52923 | 7380 | 3496 | 3496 | NGT | No | Below background | LL11ss-028 | 11/10/2000 |
| Antimony | 7440-36-0 | 15/ 30 | 0.084 | 0.77 | 0.246 | 0.96 | No | Below background | 13.6 | 2.82 | 175 | 2.82 | RC | No | Below background | LL11sd-016 | 11/14/2000 |
| **Arsenic** | **7440-38-2** | **29/ 30** | **6.5** | **40.4** | **12** | **15.4** | **Yes** | **Exceeds background** | **0.425** | **0.524** | **2.78** | **0.425** | **RA** | **Yes** | **Exceeds screening level** | **LL11ss-070** | **4/12/2010** |
| Barium | 7440-39-3 | 30/ 30 | 26.8 | 128 | 61.3 | 88.4 | Yes | Exceeds background | 8966 | 1413 | 351 | 351 | NGT | No | Below risk screening criteria | LL11ss-081 | 4/12/2010 |
| Beryllium | 7440-41-7 | 30/ 30 | 0.35 | 0.76 | 0.528 | 0.88 | No | Below background | -- | -- | -- | 16 | RSL | No | Below background | LL11ss-080 | 4/12/2010 |
| Cadmium | 7440-43-9 | 17/ 30 | 0.057 | 0.92 | 0.191 | 0 | Yes | Exceeds background | 22.3 | 6.41 | 10.9 | 6.41 | RC | No | Below risk screening criteria | LL11ss-078 | 4/12/2010 |
| Calcium | 7440-70-2 | 29/ 30 | 180 | 18100 | 2970 | 15800 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sd-016 | 11/14/2000 |
| **Chromium[d]** | **7440-47-3** | **30/ 30** | **9.3** | **19** | **13.3** | **17.4** | **Yes** | **Exceeds background** | **90.4** | **19.9** | **1.64** | **1.64** | **NGT** | **Yes** | **Exceeds screening level** | **LL11ss-030** | **11/14/2000** |
| **Cobalt** | **7440-48-4** | **30/ 30** | **5.4** | **13.9** | **8.46** | **10.4** | **Yes** | **Exceeds background** | **803** | **131** | **7.03** | **7.03** | **NGT** | **Yes** | **Exceeds screening level** | **LL11sd-014** | **11/14/2000** |
| Copper | 7440-50-8 | 30/ 30 | 5.8 | 21 | 13.5 | 17.7 | Yes | Exceeds background | 2714 | 311 | 25368 | 311 | RC | No | Below risk screening criteria | LL11sb-006 | 10/31/2000 |
| **Cyanide** | **57-12-5** | **1/ 17** | **0.54** | **0.54** | **0.269** | **0** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **0.27** | **RSL** | **Yes** | **Exceeds screening level** | **LL11ss-030** | **11/14/2000** |
| Iron | 7439-89-6 | 30/ 30 | 14300 | 27300 | 19900 | 23100 | No | Essential Nutrient | 19010 | 2313 | 184370 | 180000 | RDA | No | Essential Nutrient | LL11ss-030 | 11/14/2000 |
| Lead | 7439-92-1 | 29/ 30 | 9.9 | 33.9 | 18.1 | 26.1 | Yes | Exceeds background | -- | -- | -- | 400 | RSL | No | Below risk screening criteria | LL11ss-081 | 4/12/2010 |
| Magnesium | 7439-95-4 | 30/ 30 | 1430 | 6390 | 2340 | 3030 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sd-016 | 11/14/2000 |
| **Manganese** | **7439-96-5** | **30/ 30** | **210** | **1930** | **550** | **1450** | **Yes** | **Exceeds background** | **1482** | **293** | **35.1** | **35.1** | **NGT** | **Yes** | **Exceeds screening level** | **LL11sd-014** | **11/14/2000** |
| Mercury | 7439-97-6 | 14/ 30 | 0.02 | 0.08 | 0.034 | 0.036 | Yes | Exceeds background | 16.5 | 2.27 | 172 | 2.27 | RC | No | Below risk screening criteria | LL11sd-020 | 11/15/2000 |
| Nickel | 7440-02-0 | 30/ 30 | 8.5 | 26.2 | 15.5 | 21.1 | Yes | Exceeds background | 1346 | 155 | 12639 | 155 | RC | No | Below risk screening criteria | LL11ss-070 | 4/12/2010 |
| Nitrate | 14797-55-8 | 6/ 17 | 0.64 | 3 | 0.778 | -- | Yes | Exceeds background | 114196 | 12487 | 1E+06 | 12487 | RC | No | Below risk screening criteria | LL11sd-014 | 11/14/2000 |
| Potassium | 7440-09-7 | 30/ 30 | 437 | 1980 | 991 | 927 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sb-005 | 10/31/2000 |
| Selenium | 7782-49-2 | 20/ 30 | 0.59 | 1.2 | 0.626 | 1.4 | No | Below background | -- | -- | -- | 39 | RSL | No | Below background | LL11ss-081 | 4/12/2010 |
| Silver | 7440-22-4 | 8/ 30 | 0.024 | 0.06 | 0.139 | 0 | Yes | Exceeds background | 324 | 38.6 | 3105 | 38.6 | RC | No | Below risk screening criteria | LL11ss-081 | 4/12/2010 |
| Sodium | 7440-23-5 | 28/ 30 | 22.5 | 990 | 432 | 123 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sb-010 | 10/31/2000 |
| **Sulfide** | **18496-25-8** | **11/ 17** | **31.1** | **85.5** | **41.6** | **--** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **--** | **--** | **Yes** | **Detected and no screening level** | **LL11ss-030** | **11/14/2000** |
| Thallium | 7440-28-0 | 14/ 30 | 0.1 | 0.23 | 0.124 | 0 | Yes | Exceeds background | 4.76 | 0.612 | 47.7 | 0.612 | RC | No | Below risk screening criteria | LL11sd-022 | 11/15/2000 |
| Vanadium | 7440-62-2 | 30/ 30 | 12.2 | 28.4 | 19.3 | 31.1 | No | Below background | 156 | 44.9 | 2304 | 44.9 | RC | No | Below background | LL11ss-028 | 11/10/2000 |
| Zinc | 7440-66-6 | 30/ 30 | 38.7 | 478 | 78.2 | 61.8 | Yes | Exceeds background | 19659 | 2321 | 187269 | 2321 | RC | No | Below risk screening criteria | LL11ss-078 | 4/12/2010 |

**Table G-1. SRC and COPC Screening for Surface Soil (0-1 ft bgs Discrete Samples) at Load Line 11 (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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Explosives*** | | | | | | | | | | | | | | | | | |
| HMX | 2691-41-0 | 1/ 29 | 0.013 | 0.013 | 0.12 | -- | Yes | Detected organic | 1909 | 359 | 23464 | 359 | RC | No | Below risk screening criteria | LL11ss-081 | 4/12/2010 |
| Nitrocellulose | 9004-70-0 | 3/ 5 | 0.89 | 1.2 | 1.8 | -- | Yes | Detected organic | -- | -- | -- | 19000000 | RSL | No | Below risk screening criteria | LL11ss-029 | 11/14/2000 |
| PETN | 78-11-5 | 1/ 12 | 0.036 | 0.036 | 0.23 | -- | Yes | Detected organic | -- | -- | -- | 13 | RSL | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| ***Pesticides/PCBs*** | | | | | | | | | | | | | | | | | |
| PCB-1254 | 11097-69-1 | 1/ 14 | 0.035 | 0.035 | 0.0206 | -- | Yes | Detected organic | 0.203 | 0.12 | 3.46 | 0.12 | RC | No | Below risk screening criteria | LL11ss-078 | 4/12/2010 |
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | 2/ 14 | 0.012 | 0.065 | 0.0405 | -- | Yes | Detected organic | -- | -- | -- | 360 | RSL | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| Anthracene | 120-12-7 | 4/ 14 | 0.011 | 0.13 | 0.0469 | -- | Yes | Detected organic | -- | -- | -- | 1800 | RSL | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| **Benz(a)anthracene** | **56-55-3** | **9/ 14** | **0.013** | **0.32** | **0.0656** | **--** | **Yes** | **Detected organic** | **0.221** | **0.65** | **4.77** | **0.221** | **RA** | **Yes** | **Exceeds screening level** | **LL11sb-067** | **3/18/2010** |
| **Benzo(a)pyrene** | **50-32-8** | **8/ 14** | **0.014** | **0.28** | **0.0741** | **--** | **Yes** | **Detected organic** | **0.022** | **0.065** | **0.477** | **0.022** | **RA** | **Yes** | **Exceeds screening level** | **LL11sb-067** | **3/18/2010** |
| **Benzo(b)fluoranthene** | **205-99-2** | **7/ 14** | **0.022** | **0.41** | **0.0985** | **--** | **Yes** | **Detected organic** | **0.221** | **0.65** | **4.77** | **0.221** | **RA** | **Yes** | **Exceeds screening level** | **LL11sb-067** | **3/18/2010** |
| Benzo(ghi)perylene[e] | 191-24-2 | 8/ 14 | 0.013 | 0.21 | 0.0626 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| Benzo(k)fluoranthene | 207-08-9 | 7/ 14 | 0.0094 | 0.13 | 0.0593 | -- | Yes | Detected organic | 2.21 | 6.5 | 47.7 | 2.21 | RA | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| Chrysene | 218-01-9 | 9/ 14 | 0.016 | 0.28 | 0.0693 | -- | Yes | Detected organic | 22.1 | 65 | 477 | 22.1 | RA | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| **Dibenz(a,h)anthracene** | **53-70-3** | **1/ 14** | **0.069** | **0.069** | **0.0404** | **--** | **Yes** | **Detected organic** | **0.022** | **0.065** | **0.477** | **0.022** | **RA** | **Yes** | **Exceeds screening level** | **LL11sb-067** | **3/18/2010** |
| Fluoranthene | 206-44-0 | 11/ 14 | 0.011 | 0.78 | 0.137 | -- | Yes | Detected organic | 276 | 163 | 5087 | 163 | RC | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| Fluorene | 86-73-7 | 1/ 14 | 0.049 | 0.049 | 0.0389 | -- | Yes | Detected organic | 737 | 243 | 11458 | 243 | RC | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 7/ 14 | 0.011 | 0.19 | 0.0599 | -- | Yes | Detected organic | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| Naphthalene | 91-20-3 | 2/ 14 | 0.0094 | 0.01 | 0.0365 | -- | Yes | Detected organic | 368 | 122 | 1541 | 122 | RC | No | Below risk screening criteria | LL11sb-063 | 3/22/2010 |
| Phenanthrene[e] | 85-01-8 | 8/ 14 | 0.012 | 0.52 | 0.0907 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |
| Pyrene | 129-00-0 | 10/ 14 | 0.01 | 0.59 | 0.116 | -- | Yes | Detected organic | 207 | 122 | 3815 | 122 | RC | No | Below risk screening criteria | LL11sb-067 | 3/18/2010 |

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

[b]FWCUGs for RA, RC, and NGT from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

[c]Screening 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 = U.S. Environmental Protection Agency Residential Regional Screening Level

[d]FWCUG is the most conservative (smallest) of the FWCUGs for hexavalent and trivalent chromium.

[e]No reference dose or cancer potency factors are available for these polycyclic aromatic hydrocarbons; therefore, the RSL value for pyrene was used (NDEP 2006).

bgs = Below ground surface.
CAS = Chemical Abstract Service.
COPC = Chemical of potential concern.
ft = Feet.
FWCUG = Facility-wide cleanup goals.
HQ = Hazard quotient.
mg/kg = Milligrams per kilogram.
PCB = Polychlorinated biphenyl.
PETN = Pentaerythritol tetranitrate.
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 11**

| 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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Former Production Area** | | | | | | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | 67/ 67 | 4760 | 16400 | 10400 | 19500 | No | Below background | 52923 | 7380 | 3496 | 3496 | NGT | No | Below background | LL11ss-023 | 11/9/2000 |
| Antimony | 7440-36-0 | 36/ 66 | 0.077 | 0.92 | 0.26 | 0.96 | No | Below background | 13.6 | 2.82 | 175 | 2.82 | RC | No | Below background | LL11ss-004 | 11/7/2000 |
| **Arsenic** | **7440-38-2** | **65/ 67** | **4.3** | **25.8** | **13.4** | **19.8** | **Yes** | **Exceeds background** | **0.425** | **0.524** | **2.78** | **0.425** | **RA** | **Yes** | **Exceeds screening level** | **LL11sb-022** | **8/22/2000** |
| Barium | 7440-39-3 | 67/ 67 | 19.2 | 127 | 55.2 | 124 | Yes | Exceeds background | 8966 | 1413 | 351 | 351 | NGT | No | Below risk screening criteria | LL11cs-012 | 3/23/2001 |
| Beryllium | 7440-41-7 | 64/ 67 | 0.25 | 1.2 | 0.573 | 0.88 | Yes | Exceeds background | -- | -- | -- | 16 | RSL | No | Below risk screening criteria | LL11cs-012 | 3/23/2001 |
| Cadmium | 7440-43-9 | 21/ 67 | 0.044 | 0.47 | 0.109 | 0 | Yes | Exceeds background | 22.3 | 6.41 | 10.9 | 6.41 | RC | No | Below risk screening criteria | LL11cs-001 | 1/24/2001 |
| Calcium | 7440-70-2 | 67/ 67 | 392 | 32600 | 5090 | 35500 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sb-020 | 8/21/2000 |
| Chromium[d] | 7440-47-3 | 67/ 67 | 7.4 | 21.9 | 14 | 27.2 | No | Below background | 90.4 | 19.9 | 1.64 | 1.64 | NGT | No | Below background | LL11cs-023 | 3/21/2001 |
| **Cobalt** | **7440-48-4** | **67/ 67** | **4.5** | **27.1** | **8.93** | **23.2** | **Yes** | **Exceeds background** | **803** | **131** | **7.03** | **7.03** | **NGT** | **Yes** | **Exceeds screening level** | **LL11sb-060** | **3/18/2010** |
| Copper | 7440-50-8 | 67/ 67 | 10 | 27.6 | 18.5 | 32.3 | No | Below background | 2714 | 311 | 25368 | 311 | RC | No | Below background | LL11ss-003 | 11/6/2000 |
| Cyanide | 57-12-5 | 2/ 45 | 0.29 | 0.79 | 0.207 | 0 | No | <5% Detected | -- | -- | -- | 0.27 | RSL | No | <5% Detected | LL11ss-004 | 11/7/2000 |
| Iron | 7439-89-6 | 67/ 67 | 14200 | 47600 | 22400 | 35200 | No | Essential Nutrient | 19010 | 2313 | 184370 | 180000 | RDA | No | Essential Nutrient | LL11cs-023 | 3/21/2001 |
| Lead | 7439-92-1 | 65/ 67 | 4.8 | 65.1 | 16.8 | 19.1 | Yes | Exceeds background | -- | -- | -- | 400 | RSL | No | Below risk screening criteria | LL11sb-023 | 8/22/2000 |
| Magnesium | 7439-95-4 | 67/ 67 | 1210 | 8270 | 3300 | 8790 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sb-020 | 8/21/2000 |
| Manganese | 7439-96-5 | 67/ 67 | 102 | 1140 | 424 | 3030 | No | Below background | 1482 | 293 | 35.1 | 35.1 | NGT | No | Below background | LL11cs-028 | 3/21/2001 |
| Mercury | 7439-97-6 | 5/ 67 | 0.026 | 0.05 | 0.0262 | 0.044 | Yes | Exceeds background | 16.5 | 2.27 | 172 | 2.27 | RC | No | Below risk screening criteria | LL11ss-010 | 11/13/2000 |
| Nickel | 7440-02-0 | 67/ 67 | 10.2 | 36 | 19.2 | 60.7 | No | Below background | 1346 | 155 | 12639 | 155 | RC | No | Below background | LL11cs-012 | 3/23/2001 |
| Nitrate | 14797-55-8 | 12/ 45 | 0.14 | 15 | 1.33 | -- | Yes | Exceeds background | 114196 | 12487 | 1E+06 | 12487 | RC | No | Below risk screening criteria | LL11cs-005 | 2/21/2001 |
| Potassium | 7440-09-7 | 67/ 67 | 574 | 3090 | 1370 | 3350 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sb-020 | 8/21/2000 |
| Selenium | 7782-49-2 | 18/ 67 | 0.42 | 1.4 | 0.443 | 1.5 | No | Below background | -- | -- | -- | 39 | RSL | No | Below background | LL11sb-060 | 3/18/2010 |
| Silver | 7440-22-4 | 7/ 67 | 0.017 | 0.021 | 0.178 | 0 | Yes | Exceeds background | 324 | 38.6 | 3105 | 38.6 | RC | No | Below risk screening criteria | LL11sb-061 | 3/17/2010 |
| Sodium | 7440-23-5 | 63/ 67 | 34.3 | 1010 | 451 | 145 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11cs-012 | 3/23/2001 |
| **Sulfate** | **14808-79-8** | **5/ 45** | **19.9** | **44.2** | **26.9** | **--** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **--** | **--** | **Yes** | **Detected and no screening level** | **LL11sb-042** | **3/13/2001** |
| **Sulfide** | **18496-25-8** | **23/ 45** | **15.1** | **161** | **32.9** | **--** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **--** | **--** | **Yes** | **Detected and no screening level** | **LL11ss-023** | **11/9/2000** |
| Thallium | 7440-28-0 | 22/ 67 | 0.1 | 0.23 | 0.111 | 0.91 | No | Below background | 4.76 | 0.612 | 47.7 | 0.612 | RC | No | Below background | LL11ss-020 | 11/10/2000 |
| Vanadium | 7440-62-2 | 67/ 67 | 8.7 | 29 | 17.9 | 37.6 | No | Below background | 156 | 44.9 | 2304 | 44.9 | RC | No | Below background | LL11ss-024 | 11/9/2000 |
| Zinc | 7440-66-6 | 67/ 67 | 40.1 | 79.2 | 56.9 | 93.3 | No | Below background | 19659 | 2321 | 187269 | 2321 | RC | No | Below background | LL11cs-004 | 2/21/2001 |
| ***Explosives*** | | | | | | | | | | | | | | | | | |
| Nitrocellulose | 9004-70-0 | 8/ 8 | 0.87 | 2 | 1.51 | -- | Yes | Detected organic | -- | -- | -- | 19000000 | RSL | No | Below risk screening criteria | LL11sb-043 | 3/13/2001 |
| ***Pesticides/PCBs*** | | | | | | | | | | | | | | | | | |
| **PCB-1254** | **11097-69-1** | **4/ 19** | **0.023** | **0.79** | **0.0576** | **--** | **Yes** | **Detected organic** | **0.203** | **0.12** | **3.46** | **0.12** | **RC** | **Yes** | **Exceeds screening level** | **LL11ss-016** | **11/13/2000** |
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | | | | | | |
| Benz(a)anthracene | 56-55-3 | 1/ 22 | 0.17 | 0.17 | 0.118 | -- | No | <5% Detected | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | <5% Detected | LL11cs-019 | 3/23/2001 |
| Benzo(a)pyrene | 50-32-8 | 1/ 22 | 0.2 | 0.2 | 0.119 | -- | No | <5% Detected | 0.022 | 0.065 | 0.477 | 0.022 | RA | No | <5% Detected | LL11cs-019 | 3/23/2001 |
| Benzo(b)fluoranthene | 205-99-2 | 1/ 22 | 0.22 | 0.22 | 0.12 | -- | No | <5% Detected | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | <5% Detected | LL11cs-019 | 3/23/2001 |
| Chrysene | 218-01-9 | 1/ 22 | 0.21 | 0.21 | 0.12 | -- | No | <5% Detected | 22.1 | 65 | 477 | 22.1 | RA | No | <5% Detected | LL11cs-019 | 3/23/2001 |
| Fluoranthene | 206-44-0 | 1/ 22 | 0.33 | 0.33 | 0.125 | -- | No | <5% Detected | 276 | 163 | 5087 | 163 | RC | No | <5% Detected | LL11cs-019 | 3/23/2001 |
| Phenanthrene[e] | 85-01-8 | 1/ 22 | 0.17 | 0.17 | 0.118 | -- | No | <5% Detected | -- | -- | -- | 180 | RSL | No | <5% Detected | LL11cs-019 | 3/23/2001 |
| Pyrene | 129-00-0 | 1/ 22 | 0.41 | 0.41 | 0.129 | -- | No | <5% Detected | 207 | 122 | 3815 | 122 | RC | No | <5% Detected | LL11cs-019 | 3/23/2001 |

**Table G-2. SRC and COPC Screening for Subsurface Soil (1-13 ft bgs Discrete Samples) at Load Line 11 (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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Non-Production Area** | | | | | | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | | | | | | |
| **Aluminum** | **7429-90-5** | **45/ 45** | **4720** | **24500** | **9790** | **19500** | **Yes** | **Exceeds background** | **52923** | **7380** | **3496** | **3496** | **NGT** | **Yes** | **Exceeds screening level** | **LL11cs-013** | **3/23/2001** |
| Antimony | 7440-36-0 | 15/ 45 | 0.077 | 0.56 | 0.18 | 0.96 | No | Below background | 13.6 | 2.82 | 175 | 2.82 | RC | No | Below background | LL11ss-029 | 11/14/2000 |
| **Arsenic** | **7440-38-2** | **39/ 45** | **6** | **44.1** | **14.2** | **19.8** | **Yes** | **Exceeds background** | **0.425** | **0.524** | **2.78** | **0.425** | **RA** | **Yes** | **Exceeds screening level** | **LL11cs-045** | **3/22/2001** |
| **Barium** | **7440-39-3** | **45/ 45** | **19.7** | **4190** | **139** | **124** | **Yes** | **Exceeds background** | **8966** | **1413** | **351** | **351** | **NGT** | **Yes** | **Exceeds screening level** | **LL11cs-050** | **3/22/2001** |
| Beryllium | 7440-41-7 | 39/ 45 | 0.25 | 3.2 | 0.531 | 0.88 | Yes | Exceeds background | -- | -- | -- | 16 | RSL | No | Below risk screening criteria | LL11cs-050 | 3/22/2001 |
| Cadmium | 7440-43-9 | 21/ 45 | 0.037 | 0.38 | 0.119 | 0 | Yes | Exceeds background | 22.3 | 6.41 | 10.9 | 6.41 | RC | No | Below risk screening criteria | LL11cs-034 | 3/20/2001 |
| Calcium | 7440-70-2 | 45/ 45 | 112 | 20400 | 2000 | 35500 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sb-063 | 3/22/2010 |
| Chromium[d] | 7440-47-3 | 45/ 45 | 5.9 | 24.7 | 12.8 | 27.2 | No | Below background | 90.4 | 19.9 | 1.64 | 1.64 | NGT | No | Below background | LL11ss-030 | 11/14/2000 |
| **Cobalt** | **7440-48-4** | **45/ 45** | **3.3** | **24.7** | **8.42** | **23.2** | **Yes** | **Exceeds background** | **803** | **131** | **7.03** | **7.03** | **NGT** | **Yes** | **Exceeds screening level** | **LL11cs-036** | **3/20/2001** |
| Copper | 7440-50-8 | 45/ 45 | 6 | 62.3 | 18.6 | 32.3 | Yes | Exceeds background | 2714 | 311 | 25368 | 311 | RC | No | Below risk screening criteria | LL11cs-050 | 3/22/2001 |
| **Cyanide** | **57-12-5** | **7/ 25** | **0.0097** | **1** | **0.163** | **0** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **0.27** | **RSL** | **Yes** | **Exceeds screening level** | **LL11ss-030** | **11/14/2000** |
| Iron | 7439-89-6 | 45/ 45 | 9560 | 54800 | 21800 | 35200 | No | Essential Nutrient | 19010 | 2313 | 184370 | 180000 | RDA | No | Essential Nutrient | LL11cs-050 | 3/22/2001 |
| Lead | 7439-92-1 | 40/ 45 | 5.3 | 160 | 14.2 | 19.1 | Yes | Exceeds background | -- | -- | -- | 400 | RSL | No | Below risk screening criteria | LL11cs-050 | 3/22/2001 |
| Magnesium | 7439-95-4 | 45/ 45 | 786 | 4710 | 2440 | 8790 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sb-063 | 3/22/2010 |
| Manganese | 7439-96-5 | 45/ 45 | 103 | 1930 | 411 | 3030 | No | Below background | 1482 | 293 | 35.1 | 35.1 | NGT | No | Below background | LL11cs-036 | 3/20/2001 |
| Mercury | 7439-97-6 | 6/ 45 | 0.025 | 0.068 | 0.0317 | 0.044 | Yes | Exceeds background | 16.5 | 2.27 | 172 | 2.27 | RC | No | Below risk screening criteria | LL11sb-069 | 3/22/2010 |
| Nickel | 7440-02-0 | 45/ 45 | 8.6 | 33.5 | 17.6 | 60.7 | No | Below background | 1346 | 155 | 12639 | 155 | RC | No | Below background | LL11cs-036 | 3/20/2001 |
| Nitrate | 14797-55-8 | 14/ 25 | 0.4 | 2.9 | 0.662 | -- | Yes | Exceeds background | 114196 | 12487 | 1E+06 | 12487 | RC | No | Below risk screening criteria | LL11cs-050 | 3/22/2001 |
| Potassium | 7440-09-7 | 45/ 45 | 449 | 2600 | 1100 | 3350 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11cs-013 | 3/23/2001 |
| Selenium | 7782-49-2 | 23/ 45 | 0.52 | 1.5 | 0.543 | 1.5 | No | Below background | -- | -- | -- | 39 | RSL | No | Below background | LL11sb-065 | 3/22/2010 |
| Silver | 7440-22-4 | 6/ 45 | 0.0059 | 0.019 | 0.159 | 0 | Yes | Exceeds background | 324 | 38.6 | 3105 | 38.6 | RC | No | Below risk screening criteria | LL11sb-068 | 3/18/2010 |
| Sodium | 7440-23-5 | 35/ 45 | 27.4 | 1530 | 396 | 145 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11cs-050 | 3/22/2001 |
| **Sulfate** | **14808-79-8** | **15/ 25** | **13.6** | **44.9** | **28.1** | **--** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **--** | **--** | **Yes** | **Detected and no screening level** | **LL11cs-048** | **3/22/2001** |
| **Sulfide** | **18496-25-8** | **9/ 25** | **12.2** | **81.8** | **19.8** | **--** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **--** | **--** | **Yes** | **Detected and no screening level** | **LL11ss-030** | **11/14/2000** |
| **Thallium** | **7440-28-0** | **19/ 45** | **0.097** | **2.5** | **0.169** | **0.91** | **Yes** | **Exceeds background** | **4.76** | **0.612** | **47.7** | **0.612** | **RC** | **Yes** | **Exceeds screening level** | **LL11cs-050** | **3/22/2001** |
| Vanadium | 7440-62-2 | 45/ 45 | 8.9 | 31.5 | 16.9 | 37.6 | No | Below background | 156 | 44.9 | 2304 | 44.9 | RC | No | Below background | LL11ss-030 | 11/14/2000 |
| Zinc | 7440-66-6 | 45/ 45 | 29 | 390 | 64.9 | 93.3 | Yes | Exceeds background | 19659 | 2321 | 187269 | 2321 | RC | No | Below risk screening criteria | LL11cs-050 | 3/22/2001 |
| ***Miscellaneous*** | | | | | | | | | | | | | | | | | |
| **TPH - DRO** | **NS791** | **1/ 15** | **34** | **34** | **5.42** | **--** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **--** | **--** | **Yes** | **Detected and no screening level** | **LL11cs-043** | **3/22/2001** |
| **TPH - GRO** | **NS834** | **2/ 14** | **0.026** | **0.054** | **0.0319** | **--** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **--** | **--** | **Yes** | **Detected and no screening level** | **LL11cs-043** | **3/22/2001** |
| ***Explosives*** | | | | | | | | | | | | | | | | | |
| Nitrocellulose | 9004-70-0 | 15/ 17 | 0.77 | 2 | 1.4 | -- | Yes | Detected organic | -- | -- | -- | 19000000 | RSL | No | Below risk screening criteria | LL11sb-037 | 3/13/2001 |
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | | | | | | |
| Benz(a)anthracene | 56-55-3 | 1/ 36 | 0.011 | 0.011 | 0.128 | -- | No | <5% Detected | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | <5% Detected | LL11sb-068 | 3/18/2010 |
| **Benzo(a)pyrene** | **50-32-8** | **2/ 36** | **0.011** | **0.12** | **0.126** | **--** | **Yes** | **Detected organic** | **0.022** | **0.065** | **0.477** | **0.022** | **RA** | **Yes** | **Exceeds screening level** | **LL11cs-043** | **3/22/2001** |
| Benzo(b)fluoranthene | 205-99-2 | 3/ 36 | 0.0085 | 0.022 | 0.129 | -- | Yes | Detected organic | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | Below risk screening criteria | LL11sb-065 | 3/22/2010 |
| Benzo(ghi)perylene[e] | 191-24-2 | 1/ 36 | 0.01 | 0.01 | 0.129 | -- | No | <5% Detected | -- | -- | -- | 180 | RSL | No | <5% Detected | LL11sb-069 | 3/22/2010 |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 1/ 25 | 0.024 | 0.024 | 0.19 | -- | No | <5% Detected | -- | -- | -- | 39 | RSL | No | <5% Detected | LL11sb-068 | 3/18/2010 |
| Chrysene | 218-01-9 | 2/ 36 | 0.0082 | 0.01 | 0.128 | -- | Yes | Detected organic | 22.1 | 65 | 477 | 22.1 | RA | No | Below risk screening criteria | LL11sb-068 | 3/18/2010 |
| Di-n-butyl phthalate | 84-74-2 | 1/ 25 | 0.019 | 0.019 | 0.19 | -- | No | <5% Detected | -- | -- | -- | 630 | RSL | No | <5% Detected | LL11sb-068 | 3/18/2010 |
| Fluoranthene | 206-44-0 | 2/ 36 | 0.025 | 0.16 | 0.128 | -- | Yes | Detected organic | 276 | 163 | 5087 | 163 | RC | No | Below risk screening criteria | LL11cs-043 | 3/22/2001 |
| Phenanthrene[e] | 85-01-8 | 2/ 36 | 0.01 | 0.013 | 0.129 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sb-068 | 3/18/2010 |
| Pyrene | 129-00-0 | 2/ 36 | 0.0094 | 0.019 | 0.129 | -- | Yes | Detected organic | 207 | 122 | 3815 | 122 | RC | No | Below risk screening criteria | LL11sb-068 | 3/18/2010 |

**Table G-2. SRC and COPC Screening for Subsurface Soil (1-13 ft bgs Discrete Samples) at Load Line 11 (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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Volatile Organic Compounds*** | | | | | | | | | | | | | | | | | |
| Carbon tetrachloride | 56-23-5 | 1/ 26 | 0.001 | 0.001 | 0.00298 | -- | No | <5% Detected | -- | -- | -- | 0.65 | RSL | No | <5% Detected | LL11sb-026 | 11/16/2000 |

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

[b]FWCUGs for RA, RC, and NGT from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

[c]Screening 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 = U.S. Environmental Protection Agency Residential Regional Screening Level

[d]FWCUG is the most conservative (smallest) of the FWCUGs for hexavalent and trivalent chromium.

[e]No reference dose or cancer potency factors are available for these polycyclic aromatic hydrocarbons; therefore, the RSL value for pyrene was used (NDEP 2006).

bgs = Below ground surface.
CAS = Chemical Abstract Service.
COPC = Chemical of potential concern.
FWCUG = Facility-wide cleanup goal.
HQ = Hazard quotient.
PCB = Polychlorinated biphenyl.
SRC = Site-related contaminant.
TPH-DRO = Total petroleum hydrocarbon - diesel range organics.
TPH-GRO = Total petroleum hydrocarbon - gasoline range organics.
-- = No value available.
**Bold** = Chemical is a COPC.

**Table G-3. SRC and COPC Screening for Sediment at Load Line 11**

| 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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **East Ditch** | | | | | | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | | | | | | |
| **Aluminum** | **7429-90-5** | **2/ 2** | **10600** | **15100** | **12900** | **13900** | **Yes** | **Exceeds background** | **52923** | **7380** | **3496** | **3496** | **NGT** | **Yes** | **Exceeds screening level** | **LL11sd-083** | **02/25/10** |
| Antimony | 7440-36-0 | 1/ 2 | 0.13 | 0.13 | 0.155 | 0 | Yes | Exceeds background | 13.6 | 2.82 | 175 | 2.82 | RC | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| **Arsenic** | **7440-38-2** | **1/ 2** | **19.7** | **19.7** | **10.5** | **19.5** | **Yes** | **Exceeds background** | **0.425** | **0.524** | **2.78** | **0.425** | **RA** | **Yes** | **Exceeds screening level** | **LL11sd-083** | **02/25/10** |
| Barium | 7440-39-3 | 2/ 2 | 85.2 | 98.2 | 91.7 | 123 | No | Below background | 8966 | 1413 | 351 | 351 | NGT | No | Below background | LL11sd-083 | 02/25/10 |
| Beryllium | 7440-41-7 | 2/ 2 | 0.61 | 1 | 0.805 | 0.38 | Yes | Exceeds background | -- | -- | -- | 16 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Cadmium | 7440-43-9 | 1/ 2 | 0.47 | 0.47 | 0.268 | 0 | Yes | Exceeds background | 22.3 | 6.41 | 10.9 | 6.41 | RC | No | Below risk screening criteria | LL11cs-031 | 03/20/01 |
| Calcium | 7440-70-2 | 2/ 2 | 2390 | 3190 | 2790 | 5510 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sd-083 | 02/25/10 |
| **Chromium[d]** | **7440-47-3** | **2/ 2** | **16.5** | **18.6** | **17.6** | **18.1** | **Yes** | **Exceeds background** | **90.4** | **19.9** | **1.64** | **1.64** | **NGT** | **Yes** | **Exceeds screening level** | **LL11sd-083** | **02/25/10** |
| **Cobalt[e]** | **7440-48-4** | **2/ 2** | **8.2** | **17.4** | **12.8** | **9.1** | **Yes** | **Exceeds background** | **803** | **131** | **7.03** | **7.03** | **NGT** | **Yes** | **Exceeds screening level** | **LL11sd-083** | **02/25/10** |
| Copper | 7440-50-8 | 2/ 2 | 19.7 | 31.4 | 25.6 | 27.6 | Yes | Exceeds background | 2714 | 311 | 25368 | 311 | RC | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Iron | 7439-89-6 | 2/ 2 | 19200 | 39300 | 29300 | 28200 | No | Essential Nutrient | 19010 | 2313 | 184370 | 180000 | RDA | No | Essential Nutrient | LL11sd-083 | 02/25/10 |
| Lead | 7439-92-1 | 1/ 2 | 25.7 | 25.7 | 15.3 | 27.4 | No | Below background | -- | -- | -- | 400 | RSL | No | Below background | LL11sd-083 | 02/25/10 |
| Magnesium | 7439-95-4 | 2/ 2 | 2140 | 3660 | 2900 | 2760 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sd-083 | 02/25/10 |
| Manganese | 7439-96-5 | 2/ 2 | 665 | 754 | 710 | 1950 | No | Below background | 1482 | 293 | 35.1 | 35.1 | NGT | No | Below background | LL11cs-031 | 03/20/01 |
| Nickel | 7440-02-0 | 2/ 2 | 15.2 | 32.6 | 23.9 | 17.7 | Yes | Exceeds background | 1346 | 155 | 12639 | 155 | RC | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Potassium | 7440-09-7 | 2/ 2 | 856 | 1230 | 1040 | 1950 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sd-083 | 02/25/10 |
| Selenium | 7782-49-2 | 2/ 2 | 2 | 3.2 | 2.6 | 1.7 | Yes | Exceeds background | -- | -- | -- | 39 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Sodium | 7440-23-5 | 2/ 2 | 68.1 | 817 | 443 | 112 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11cs-031 | 03/20/01 |
| Thallium | 7440-28-0 | 1/ 2 | 0.14 | 0.14 | 0.13 | 0.89 | No | Below background | 4.76 | 0.612 | 47.7 | 0.612 | RC | No | Below background | LL11sd-083 | 02/25/10 |
| Vanadium | 7440-62-2 | 2/ 2 | 21.4 | 24.2 | 22.8 | 26.1 | No | Below background | 156 | 44.9 | 2304 | 44.9 | RC | No | Below background | LL11cs-031 | 03/20/01 |
| Zinc | 7440-66-6 | 2/ 2 | 77.6 | 234 | 156 | 532 | No | Below background | 19659 | 2321 | 187269 | 2321 | RC | No | Below background | LL11cs-031 | 03/20/01 |
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | | | | | | |
| 2-Methylnaphthalene | 91-57-6 | 1/ 1 | 0.013 | 0.013 | 0.013 | -- | Yes | Detected organic | -- | -- | -- | 24 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Anthracene | 120-12-7 | 1/ 1 | 0.025 | 0.025 | 0.025 | -- | Yes | Detected organic | -- | -- | -- | 1800 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Benz(a)anthracene | 56-55-3 | 1/ 1 | 0.11 | 0.11 | 0.11 | -- | Yes | Detected organic | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| **Benzo(a)pyrene** | **50-32-8** | **1/ 1** | **0.098** | **0.098** | **0.098** | **--** | **Yes** | **Detected organic** | **0.022** | **0.065** | **0.477** | **0.022** | **RA** | **Yes** | **Exceeds screening level** | **LL11sd-083** | **02/25/10** |
| Benzo(b)fluoranthene | 205-99-2 | 1/ 1 | 0.13 | 0.13 | 0.13 | -- | Yes | Detected organic | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Benzo(ghi)perylene | 191-24-2 | 1/ 1 | 0.064 | 0.064 | 0.064 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Benzo(k)fluoranthene | 207-08-9 | 1/ 1 | 0.056 | 0.056 | 0.056 | -- | Yes | Detected organic | 2.21 | 6.5 | 47.7 | 2.21 | RA | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Chrysene | 218-01-9 | 1/ 1 | 0.096 | 0.096 | 0.096 | -- | Yes | Detected organic | -- | -- | -- | 16 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Dibenz(a,h)anthracene | 53-70-3 | 1/ 1 | 0.017 | 0.017 | 0.017 | -- | Yes | Detected organic | 0.022 | 0.065 | 0.477 | 0.022 | RA | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Fluoranthene | 206-44-0 | 1/ 1 | 0.23 | 0.23 | 0.23 | -- | Yes | Detected organic | -- | -- | -- | 240 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Fluorene | 86-73-7 | 1/ 1 | 0.012 | 0.012 | 0.012 | -- | Yes | Detected organic | -- | -- | -- | 240 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1/ 1 | 0.056 | 0.056 | 0.056 | -- | Yes | Detected organic | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Naphthalene | 91-20-3 | 1/ 1 | 0.01 | 0.01 | 0.01 | -- | Yes | Detected organic | -- | -- | -- | 3.8 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Phenanthrene | 85-01-8 | 1/ 1 | 0.1 | 0.1 | 0.1 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| Pyrene | 129-00-0 | 1/ 1 | 0.18 | 0.18 | 0.18 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sd-083 | 02/25/10 |
| **Aluminum** | **7429-90-5** | **3/ 3** | **10100** | **17700** | **14400** | **13900** | **Yes** | **Exceeds background** | **52923** | **7380** | **3496** | **3496** | **NGT** | **Yes** | **Exceeds screening level** | **LL11cs-015** | **03/23/01** |
| Antimony | 7440-36-0 | 2/ 2 | 0.41 | 0.9 | 0.655 | 0 | Yes | Exceeds background | 13.6 | 2.82 | 175 | 2.82 | RC | No | Below risk screening criteria | LL11sd-024 | 11/16/00 |
| Arsenic | 7440-38-2 | 3/ 3 | 7.9 | 19.5 | 13 | 19.5 | No | Below background | 0.425 | 0.524 | 2.78 | 0.425 | RA | No | Below background | LL11sd-024 | 11/16/00 |
| Barium | 7440-39-3 | 3/ 3 | 64 | 111 | 87.1 | 123 | No | Below background | 8966 | 1413 | 351 | 351 | NGT | No | Below background | LL11sd-024 | 11/16/00 |
| Beryllium | 7440-41-7 | 3/ 3 | 0.61 | 1 | 0.81 | 0.38 | Yes | Exceeds background | -- | -- | -- | 16 | RSL | No | Below risk screening criteria | LL11sd-024 | 11/16/00 |
| Calcium | 7440-70-2 | 3/ 3 | 2170 | 3100 | 2600 | 5510 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sd-084 | 02/25/10 |
| **Chromium[d]** | **7440-47-3** | **3/ 3** | **12.2** | **21** | **17.9** | **18.1** | **Yes** | **Exceeds background** | **90.4** | **19.9** | **1.64** | **1.64** | **NGT** | **Yes** | **Exceeds screening level** | **LL11sd-024** | **11/16/00** |
| **Cobalt[e]** | **7440-48-4** | **3/ 3** | **7.1** | **14.1** | **9.7** | **9.1** | **Yes** | **Exceeds background** | **803** | **131** | **7.03** | **7.03** | **NGT** | **Yes** | **Exceeds screening level** | **LL11sd-024** | **11/16/00** |
| Copper | 7440-50-8 | 3/ 3 | 14.6 | 26.3 | 20.8 | 27.6 | No | Below background | 2714 | 311 | 25368 | 311 | RC | No | Below background | LL11cs-015 | 03/23/01 |
| Iron | 7439-89-6 | 3/ 3 | 17100 | 30000 | 25000 | 28200 | No | Essential Nutrient | 19010 | 2313 | 184370 | 180000 | RDA | No | Essential Nutrient | LL11cs-015 | 03/23/01 |
| Lead | 7439-92-1 | 3/ 3 | 14.7 | 22 | 18.8 | 27.4 | No | Below background | -- | -- | -- | 400 | RSL | No | Below background | LL11sd-084 | 02/25/10 |

**Table G-3. SRC and COPC Screening for Sediment at Load Line 11 (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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **West Ditch** | | | | | | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | | | | | | |
| Magnesium | 7439-95-4 | 3/ 3 | 1820 | 3630 | 2840 | 2760 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sd-024 | 11/16/00 |
| Manganese | 7439-96-5 | 3/ 3 | 164 | 530 | 296 | 1950 | No | Below background | 1482 | 293 | 35.1 | 35.1 | NGT | No | Below background | LL11sd-024 | 11/16/00 |
| Mercury | 7439-97-6 | 1/ 3 | 0.049 | 0.049 | 0.0333 | 0.059 | No | Below background | 16.5 | 2.27 | 172 | 2.27 | RC | No | Below background | LL11sd-084 | 02/25/10 |
| Nickel | 7440-02-0 | 3/ 3 | 15.6 | 27.7 | 21 | 17.7 | Yes | Exceeds background | 1346 | 155 | 12639 | 155 | RC | No | Below risk screening criteria | LL11sd-024 | 11/16/00 |
| Potassium | 7440-09-7 | 3/ 3 | 685 | 2010 | 1560 | 1950 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sd-024 | 11/16/00 |
| Selenium | 7782-49-2 | 3/ 3 | 0.5 | 1.4 | 0.853 | 1.7 | No | Below background | -- | -- | -- | 39 | RSL | No | Below background | LL11sd-084 | 02/25/10 |
| Sodium | 7440-23-5 | 3/ 3 | 36 | 1060 | 678 | 112 | No | Essential Nutrient | -- | -- | -- | 1000000 | RDA | No | Essential Nutrient | LL11sd-024 | 11/16/00 |
| **Sulfide** | **18496-25-8** | **1/ 1** | **43.4** | **43.4** | **43.4** | **--** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **--** | **--** | **Yes** | **Detected and no screening level** | **LL11sd-024** | **11/16/00** |
| Thallium | 7440-28-0 | 2/ 3 | 0.13 | 0.23 | 0.157 | 0.89 | No | Below background | 4.76 | 0.612 | 47.7 | 0.612 | RC | No | Below background | LL11cs-015 | 03/23/01 |
| Vanadium | 7440-62-2 | 3/ 3 | 17.8 | 30.8 | 24.9 | 26.1 | Yes | Exceeds background | 156 | 44.9 | 2304 | 44.9 | RC | No | Below risk screening criteria | LL11sd-024 | 11/16/00 |
| Zinc | 7440-66-6 | 3/ 3 | 65.3 | 80.9 | 75.2 | 532 | No | Below background | 19659 | 2321 | 187269 | 2321 | RC | No | Below background | LL11sd-084 | 02/25/10 |
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | | | | | | |
| Benz(a)anthracene | 56-55-3 | 1/ 1 | 0.019 | 0.019 | 0.019 | -- | Yes | Detected organic | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |
| Benzo(a)pyrene | 50-32-8 | 1/ 1 | 0.021 | 0.021 | 0.021 | -- | Yes | Detected organic | 0.022 | 0.065 | 0.477 | 0.022 | RA | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |
| Benzo(b)fluoranthene | 205-99-2 | 1/ 1 | 0.038 | 0.038 | 0.038 | -- | Yes | Detected organic | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |
| Benzo(ghi)perylene[f] | 191-24-2 | 1/ 1 | 0.017 | 0.017 | 0.017 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |
| Benzo(k)fluoranthene | 207-08-9 | 1/ 1 | 0.011 | 0.011 | 0.011 | -- | Yes | Detected organic | 2.21 | 6.5 | 47.7 | 2.21 | RA | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |
| Chrysene | 218-01-9 | 1/ 1 | 0.023 | 0.023 | 0.023 | -- | Yes | Detected organic | -- | -- | -- | 16 | RSL | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |
| Fluoranthene | 206-44-0 | 1/ 1 | 0.043 | 0.043 | 0.043 | -- | Yes | Detected organic | -- | -- | -- | 240 | RSL | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1/ 1 | 0.015 | 0.015 | 0.015 | -- | Yes | Detected organic | 0.221 | 0.65 | 4.77 | 0.221 | RA | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |
| Phenanthrene[f] | 85-01-8 | 1/ 1 | 0.016 | 0.016 | 0.016 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |
| Pyrene | 129-00-0 | 1/ 1 | 0.033 | 0.033 | 0.033 | -- | Yes | Detected organic | -- | -- | -- | 180 | RSL | No | Below risk screening criteria | LL11sd-084 | 02/25/10 |

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

[b]Facility-Wide Cleanup Goals for RA, RC, and NGT from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

[c]Screening 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

[d]FWCUGs are the most conservative (smallest) of the FWCUGs for hexavalent and trivalent chromium.

[e]No FWCUG available for cobalt in sediment. Values are FWCUG for cobalt in soil.

[f]No 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.

FWCUG = Facility-wide cleanup goals.

HQ = Hazard quotient.

mg/kg = Milligrams per kilogram.

SRC = Site-related contaminant.

-- = No value available.

**Bold** = Chemical is a COPC.

**Table G-4. SRC and COPC Screening for Surface Water at Load Line 11**

| 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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **East Ditch** | | | | | | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | 1/ 1 | 0.674 | 0.674 | 0.674 | 3.37 | No | Below background | 63.895 | 14.827 | 73.445 | 14.827 | RC | No | Below background | LL11sw-083 | 02/25/10 |
| Arsenic | 7440-38-2 | 1/ 1 | 0.00058 | 0.00058 | 0.00058 | 0.0032 | No | Below background | 0.0011 | 0.0012 | 0.0042 | 0.0011 | RA | No | Below background | LL11sw-083 | 02/25/10 |
| Barium | 7440-39-3 | 1/ 1 | 0.0136 | 0.0136 | 0.0136 | 0.0475 | No | Below background | 12.131 | 2.901 | 10.64 | 2.901 | RC | No | Below background | LL11sw-083 | 02/25/10 |
| Calcium | 7440-70-2 | 1/ 1 | 33.1 | 33.1 | 33.1 | 41.4 | No | Essential Nutrient | -- | -- | -- | 500 | RDA | No | Essential Nutrient | LL11sw-083 | 02/25/10 |
| Chromium[d] | 7440-47-3 | 1/ 1 | 0.00078 | 0.00078 | 0.00078 | 0 | Yes | Exceeds background | 0.0903 | 0.0303 | 0.0245 | 0.0245 | NGT | No | Below risk screening criteria | LL11sw-083 | 02/25/10 |
| Cobalt | 7440-48-4 | 1/ 1 | 0.00017 | 0.00017 | 0.00017 | 0 | Yes | Exceeds background | -- | -- | -- | 0.0006 | RSL | No | Below risk screening criteria | LL11sw-083 | 02/25/10 |
| Copper | 7440-50-8 | 1/ 1 | 0.0014 | 0.0014 | 0.0014 | 0.0079 | No | Below background | 2.788 | 0.614 | 7.199 | 0.614 | RC | No | Below background | LL11sw-083 | 02/25/10 |
| Iron | 7439-89-6 | 1/ 1 | 0.637 | 0.637 | 0.637 | 2.56 | No | Essential Nutrient | 20 | 4.527 | 31.296 | 18 | RDA | No | Essential Nutrient | LL11sw-083 | 02/25/10 |
| Lead | 7439-92-1 | 1/ 1 | 0.00044 | 0.00044 | 0.00044 | 0 | Yes | Exceeds background | -- | -- | -- | 0.015 | RSL | No | Below risk screening criteria | LL11sw-083 | 02/25/10 |
| Magnesium | 7439-95-4 | 1/ 1 | 5.59 | 5.59 | 5.59 | 10.8 | No | Essential Nutrient | -- | -- | -- | 200 | RDA | No | Essential Nutrient | LL11sw-083 | 02/25/10 |
| Manganese | 7439-96-5 | 1/ 1 | 0.0161 | 0.0161 | 0.0161 | 0.391 | No | Below background | 2.476 | 0.633 | 1.449 | 0.633 | RC | No | Below background | LL11sw-083 | 02/25/10 |
| Nickel | 7440-02-0 | 1/ 1 | 0.00091 | 0.00091 | 0.00091 | 0 | Yes | Exceeds background | 1.445 | 0.312 | 8.258 | 0.312 | RC | No | Below risk screening criteria | LL11sw-083 | 02/25/10 |
| Potassium | 7440-09-7 | 1/ 1 | 1.21 | 1.21 | 1.21 | 3.17 | No | Essential Nutrient | -- | -- | -- | 1750 | RDA | No | Essential Nutrient | LL11sw-083 | 02/25/10 |
| Selenium | 7782-49-2 | 1/ 1 | 0.00026 | 0.00026 | 0.00026 | 0 | Yes | Exceeds background | -- | -- | -- | 0.01 | RSL | No | Below risk screening criteria | LL11sw-083 | 02/25/10 |
| Sodium | 7440-23-5 | 1/ 1 | 1.86 | 1.86 | 1.86 | 21.3 | No | Essential Nutrient | -- | -- | -- | 1200 | RDA | No | Essential Nutrient | LL11sw-083 | 02/25/10 |
| Vanadium | 7440-62-2 | 1/ 1 | 0.0011 | 0.0011 | 0.0011 | 0 | Yes | Exceeds background | 0.211 | 0.0706 | 0.0572 | 0.0572 | NGT | No | Below risk screening criteria | LL11sw-083 | 02/25/10 |
| ***Pesticides/PCBs*** | | | | | | | | | | | | | | | | | |
| beta-BHC | 319-85-7 | 1/ 1 | 0.000013 | 0.000013 | 0.000013 | -- | Yes | Detected organic | 0.0009 | 0.001 | 0.0102 | 0.000946 | RA | No | Below risk screening criteria | LL11sw-083 | 02/25/10 |
| gamma-Chlordane[e] | 5103-74-2 | 1/ 1 | 0.000015 | 0.000015 | 0.000015 | -- | Yes | Detected organic | -- | -- | -- | 0.000045 | RSL | No | Below risk screening criteria | LL11sw-083 | 02/25/10 |
| **West Ditch** | | | | | | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | 1/ 1 | 2.72 | 2.72 | 2.72 | 3.37 | No | Below background | 63.895 | 14.827 | 73.445 | 14.827 | RC | No | Below background | LL11sw-084 | 02/25/10 |
| Antimony | 7440-36-0 | 1/ 1 | 0.00036 | 0.00036 | 0.00036 | 0 | Yes | Exceeds background | 0.0171 | 0.0049 | 0.0065 | 0.00491 | RC | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| **Arsenic** | **7440-38-2** | **1/ 1** | **0.0043** | **0.0043** | **0.0043** | **0.0032** | **Yes** | **Exceeds background** | **0.0011** | **0.0012** | **0.0042** | **0.0011** | **RA** | **Yes** | **Exceeds screening level** | **LL11sw-084** | **02/25/10** |
| Barium | 7440-39-3 | 1/ 1 | 0.0576 | 0.0576 | 0.0576 | 0.0475 | Yes | Exceeds background | 12.131 | 2.901 | 10.64 | 2.901 | RC | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Beryllium | 7440-41-7 | 1/ 1 | 0.00011 | 0.00011 | 0.00011 | 0 | Yes | Exceeds background | -- | -- | -- | 0.0025 | RSL | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Cadmium | 7440-43-9 | 1/ 1 | 0.00024 | 0.00024 | 0.00024 | 0 | Yes | Exceeds background | 0.0151 | 0.0051 | 0.0041 | 0.00408 | NGT | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Calcium | 7440-70-2 | 1/ 1 | 61.9 | 61.9 | 61.9 | 41.4 | No | Essential Nutrient | -- | -- | -- | 500 | RDA | No | Essential Nutrient | LL11sw-084 | 02/25/10 |
| Chromium[d] | 7440-47-3 | 1/ 1 | 0.0033 | 0.0033 | 0.0033 | 0 | Yes | Exceeds background | 0.0903 | 0.0303 | 0.0245 | 0.0245 | NGT | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| **Cobalt** | **7440-48-4** | **1/ 1** | **0.0019** | **0.0019** | **0.0019** | **0** | **Yes** | **Exceeds background** | **--** | **--** | **--** | **0.0006** | **RSL** | **Yes** | **Exceeds screening level** | **LL11sw-084** | **02/25/10** |
| Copper | 7440-50-8 | 1/ 1 | 0.0062 | 0.0062 | 0.0062 | 0.0079 | No | Below background | 2.788 | 0.614 | 7.199 | 0.614 | RC | No | Below background | LL11sw-084 | 02/25/10 |
| Iron | 7439-89-6 | 1/ 1 | 5.83 | 5.83 | 5.83 | 2.56 | No | Essential Nutrient | 20 | 4.527 | 31.296 | 18 | RDA | No | Essential Nutrient | LL11sw-084 | 02/25/10 |
| Lead | 7439-92-1 | 1/ 1 | 0.0062 | 0.0062 | 0.0062 | 0 | Yes | Exceeds background | -- | -- | -- | 0.015 | RSL | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Magnesium | 7439-95-4 | 1/ 1 | 12.8 | 12.8 | 12.8 | 10.8 | No | Essential Nutrient | -- | -- | -- | 200 | RDA | No | Essential Nutrient | LL11sw-084 | 02/25/10 |
| Manganese | 7439-96-5 | 1/ 1 | 0.559 | 0.559 | 0.559 | 0.391 | Yes | Exceeds background | 2.476 | 0.633 | 1.449 | 0.633 | RC | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Nickel | 7440-02-0 | 1/ 1 | 0.0039 | 0.0039 | 0.0039 | 0 | Yes | Exceeds background | 1.445 | 0.312 | 8.258 | 0.312 | RC | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Potassium | 7440-09-7 | 1/ 1 | 1.92 | 1.92 | 1.92 | 3.17 | No | Essential Nutrient | -- | -- | -- | 1750 | RDA | No | Essential Nutrient | LL11sw-084 | 02/25/10 |
| Selenium | 7782-49-2 | 1/ 1 | 0.00073 | 0.00073 | 0.00073 | 0 | Yes | Exceeds background | -- | -- | -- | 0.01 | RSL | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Sodium | 7440-23-5 | 1/ 1 | 6.26 | 6.26 | 6.26 | 21.3 | No | Essential Nutrient | -- | -- | -- | 1200 | RDA | No | Essential Nutrient | LL11sw-084 | 02/25/10 |
| Vanadium | 7440-62-2 | 1/ 1 | 0.0051 | 0.0051 | 0.0051 | 0 | Yes | Exceeds background | 0.211 | 0.0706 | 0.0572 | 0.0572 | NGT | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |

**Table G-4. SRC and COPC Screening for Surface Water at Load Line 11 (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=$10^{-6}$) RA | RC | NGT | Risk Screening Level | Screening Level Source[c] | COPC? (yes/no) | COPC Justification | Station at Max Detect | Date Collected at Max Detect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Pesticides/PCBs*** | | | | | | | | | | | | | | | | | |
| beta-BHC | 319-85-7 | 1/ 1 | 0.0000096 | 0.0000096 | 0.0000096 | -- | Yes | Detected organic | 0.0009 | 0.001 | 0.0102 | 0.000946 | RA | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | | | | | | |
| **Benz(a)anthracene** | **56-55-3** | **1/ 1** | **0.00035** | **0.00035** | **0.00035** | -- | **Yes** | **Detected organic** | **1E-05** | **4E-05** | **3E-05** | **0.000014** | **RA** | **Yes** | **Exceeds screening level** | **LL11sw-084** | **02/25/10** |
| **Benzo(a)pyrene** | **50-32-8** | **1/ 1** | **0.00033** | **0.00033** | **0.00033** | -- | **Yes** | **Detected organic** | **8E-07** | **2E-06** | **2E-06** | **0.0000008** | **RA** | **Yes** | **Exceeds screening level** | **LL11sw-084** | **02/25/10** |
| **Benzo(b)fluoranthene** | **205-99-2** | **1/ 1** | **0.00041** | **0.00041** | **0.00041** | -- | **Yes** | **Detected organic** | **8E-06** | **2E-05** | **2E-05** | **0.000008** | **RA** | **Yes** | **Exceeds screening level** | **LL11sw-084** | **02/25/10** |
| Benzo(ghi)perylene[f] | 191-24-2 | 1/ 1 | 0.00024 | 0.00024 | 0.00024 | -- | Yes | Detected organic | -- | -- | -- | 0.012 | RSL | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Benzo(k)fluoranthene | 207-08-9 | 1/ 1 | 0.00024 | 0.00024 | 0.00024 | -- | Yes | Detected organic | 0.0233 | 0.025 | 0.251 | 0.0233 | RA | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Chrysene | 218-01-9 | 1/ 1 | 0.00035 | 0.00035 | 0.00035 | -- | Yes | Detected organic | 0.0014 | 0.0038 | 0.0032 | 0.00136 | RA | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Fluoranthene | 206-44-0 | 1/ 1 | 0.00073 | 0.00073 | 0.00073 | -- | Yes | Detected organic | -- | -- | -- | 0.08 | RSL | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| **Indeno(1,2,3-cd)pyrene** | **193-39-5** | **1/ 1** | **0.00021** | **0.00021** | **0.00021** | -- | **Yes** | **Detected organic** | **8E-06** | **2E-05** | **2E-05** | **0.000008** | **RA** | **Yes** | **Exceeds screening level** | **LL11sw-084** | **02/25/10** |
| Phenanthrene[f] | 85-01-8 | 1/ 1 | 0.00022 | 0.00022 | 0.00022 | -- | Yes | Detected organic | -- | -- | -- | 0.012 | RSL | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |
| Pyrene | 129-00-0 | 1/ 1 | 0.00057 | 0.00057 | 0.00057 | -- | Yes | Detected organic | 2.19 | 0.469 | 19.654 | 0.469 | RC | No | Below risk screening criteria | LL11sw-084 | 02/25/10 |

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

[b]FWCUGs for RA, RC, and NGT from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).

[c]Screening 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

[d]FWCUGs are the most conservative (smallest) of the FWCUGs for hexavalent and trivalent chromium.

[e]The RSL value for chlordane was used as a surrogate.

[f]No reference dose or cancer potency factors are available for these polycyclic aromatic hydrocarbons; therefore, the RSL value for pyrene was used (NDEP 2006).

BHC = Hexachlorocyclohexane.
CAS = Chemical Abstract Service.
COPC = Chemical of potential concern.
FWCUG = Facility-wide cleanup goals.
HQ = Hazard quotient.
mg/L = Milligrams per liter.
PCB = Polychlorinated biphenyl.
SRC = Site-related contaminant.
-- = No value available.
**Bold** = Chemical is a COPC.

**Table G-5. COC Screening for Surface Soil (0-1 ft bgs Discrete Samples) at Load Line 11**
**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 (Adult and Child) FWCUG[a] HQ=1 | Resident (Adult and Child) FWCUG[a] Risk=$10^{-5}$ | Background Criteria[b] | EPC Exceeds FWCUG? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Former Production Area** | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | 47/ 47 | 789 | 23800 | 11400 | 12500 | X | 12500 | 73798 | -- | 17700 | No |
| Arsenic[c] | 7440-38-2 | 47/ 47 | 2.7 | 30.2 | 13.2 | 14.5 | X | 14.5 | 20.2 | 4.25 | 15.4 | No |
| Chromium[d] | 7440-47-3 | 47/ 47 | 3.5 | 28.4 | 14.6 | 15.7 | X | 15.7 | 81473 | -- | 17.4 | No |
| Cobalt | 7440-48-4 | 47/ 47 | 2.2 | 33.8 | 8.54 | 9.65 | X | 9.65 | 1313 | 8030 | 10.4 | No |
| Cyanide | 57-12-5 | 3/ 34 | 0.58 | 1.6 | 0.301 | 0.374 | D | 0.374 | 2.7 | -- | 0 | No |
| Manganese | 7439-96-5 | 47/ 47 | 63.9 | 1540 | 511 | 629 | L | 629 | 2927 | -- | 1450 | No |
| **Sulfide** | 18496-25-8 | 22/ 34 | 29.9 | 244 | 49.3 | 65.3 | X | 65.3 | -- | -- | -- | NA |
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | |
| Benz(a)anthracene | 56-55-3 | 7/ 14 | 0.0089 | 0.37 | 0.147 | 0.21 | N | 0.21 | -- | 2.21 | -- | No |
| Benzo(a)pyrene | 50-32-8 | 7/ 14 | 0.0091 | 0.45 | 0.151 | 0.219 | N | 0.219 | -- | 0.221 | -- | No |
| Benzo(b)fluoranthene | 205-99-2 | 6/ 14 | 0.011 | 0.56 | 0.188 | 0.271 | D | 0.271 | -- | 2.21 | -- | No |
| Dibenz(a,h)anthracene | 53-70-3 | 3/ 14 | 0.022 | 0.076 | 0.118 | 0.165 | D | 0.076 | -- | 0.221 | -- | No |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 4/ 14 | 0.021 | 0.27 | 0.142 | 0.193 | D | 0.193 | -- | 2.21 | -- | No |
| ***Pesticides/PCBs*** | | | | | | | | | | | | |
| PCB-1254 | 11097-69-1 | 4/ 12 | 0.02 | 0.42 | 0.0562 | 0.117 | D | 0.117 | 1.2 | 2.03 | -- | No |
| **Non-Production Area** | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | |
| Arsenic[c] | 7440-38-2 | 29/ 30 | 6.5 | 40.4 | 12 | 14.1 | X | 14.1 | 20.2 | 4.25 | 15.4 | No |
| Chromium[d] | 7440-47-3 | 30/ 30 | 9.3 | 19 | 13.3 | 14.1 | L | 14.1 | 81473 | -- | 17.4 | No |
| Cobalt | 7440-48-4 | 30/ 30 | 5.4 | 13.9 | 8.46 | 9.19 | L | 9.19 | 1313 | 8030 | 10.4 | No |
| Cyanide | 57-12-5 | 1/ 17 | 0.54 | 0.54 | 0.269 | 0.304 | D | 0.304 | 2.7 | -- | 0 | No |
| Manganese | 7439-96-5 | 30/ 30 | 210 | 1930 | 550 | 675 | X | 675 | 2927 | -- | 1450 | No |
| Sulfide | 18496-25-8 | 11/ 17 | 31.1 | 85.5 | 41.6 | 51.9 | N | 51.9 | -- | -- | -- | NA |
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | |
| Benz(a)anthracene | 56-55-3 | 9/ 14 | 0.013 | 0.32 | 0.0656 | 0.358 | L | 0.32 | -- | 2.21 | -- | No |
| **Benzo(a)pyrene** | **50-32-8** | **8/ 14** | **0.014** | **0.28** | **0.0741** | **0.584** | **L** | **0.28** | **--** | **0.221** | **--** | **Yes** |
| Benzo(b)fluoranthene | 205-99-2 | 7/ 14 | 0.022 | 0.41 | 0.0985 | 1.01 | L | 0.41 | -- | 2.21 | -- | No |
| Dibenz(a,h)anthracene | 53-70-3 | 1/ 14 | 0.069 | 0.069 | 0.0404 | 0.073 | D | 0.069 | -- | 0.221 | -- | No |

All units are milligrams per kilogram (mg/kg).
[a]FWCUGs from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).
[b]Background criteria for soil 0-1 ft bgs soil 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).
[c]Since Resident FWCUG for arsenic is less than the background level, background is used as the cleanup goal for comparison.
[d]Using 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 11.
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.
COC = Chemical of concern.
COPC = Chemical of potential concern.
CAS = Chemical Abstract Service.
EPC = Exposure point concentration.
FWCUG = Facility-wide cleanup goal.
HQ = Hazard quotient.
NA = No FWCUG available for comparison.
PCB = Polychlorinated biphenyl.
UCL 95 = 95% Upper Confidence Limit of the mean.
**Bold** = EPC exceeds FWCUG
-- = No value available

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**Table G-6. Sum-of-Ratios for Non-Carcinogens: COC Screening for Surface Soil (0-1 ft bgs Discrete Samples) at Load Line 11**
**Unrestricted Land Use Receptor: Resident (Adult and Child)**

| COPC | CAS Number | EPC | Resident (Adult and Child) FWCUG[a] HQ = 1 | Background Criteria[b] | Ratio |
|---|---|---|---|---|---|
| **Former Production Area** | | | | | |
| Aluminum | 7429-90-5 | 12500 | 73798 | 17700 | NA |
| Arsenic | 7440-38-2 | 14.5 | 20.2 | 15.4 | NA |
| Chromium | 7440-47-3 | 15.7 | 81473 | 17.4 | NA |
| Cobalt | 7440-48-4 | 9.65 | 1313 | 10.4 | NA |
| Cyanide | 57-12-5 | 0.374 | 2.7 | 0 | 0.1 |
| Manganese | 7439-96-5 | 629 | 2927 | 1450 | NA |
| PCB-1254 | 11097-69-1 | 0.117 | 2.03 | -- | 0.1 |
| **Sum-of-Ratios** | | | | | 0.2 |
| **Non-Production Area** | | | | | |
| Arsenic | 7440-38-2 | 14.1 | 20.2 | 15.4 | NA |
| Chromium | 7440-47-3 | 14.1 | 81473 | 17.4 | NA |
| Cobalt | 7440-48-4 | 9.19 | 1313 | 10.4 | NA |
| Cyanide | 57-12-5 | 0.304 | 2.7 | 0 | 0.1 |
| Manganese | 7439-96-5 | 675 | 2927 | 1450 | NA |
| **Sum-of-Ratios** | | | | | 0.1 |

[a]FWCUGs from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).
[b]Background criteria for surface soil (0-1 ft bgs) from final facility-wide background values for Ravenna Army Ammunition Plant, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).
bgs = Below ground surface.
CAS = Chemical Abstract Service.
COC = Chemical of concern.
COPC = Chemical of potential concern.
EPC = Exposure point concentration.
ft = Feet.
FWCUG = Facility-wide cleanup goal.
HQ = Hazard quotient.
NA = Not applicable, ratio not calculated as the EPC is less than the background criteria.
PCB = Polychlorinated biphenyl.
**Bold** = Sum-of-Ratios greater than 1.
-- = No value available.

**Table G-7. Sum-of-Ratios for Carcinogens: COC Screening for Surface Soil (0-1 ft bgs Discrete Samples) at Load Line 11**
**Unrestricted Land Use Receptor: Resident (Adult and Child)**

| COPC | CAS Number | EPC | Resident (Adult and Child) FWCUG[a] Risk=$10^{-5}$ | Background Criteria[b] | Ratio | Percent Contribution to SOR if > 1 |
|---|---|---|---|---|---|---|
| **Former Production Area** | | | | | | |
| Arsenic | 7440-38-2 | 14.5 | 4.25 | 15.4 | NA | -- |
| Cobalt | 7440-48-4 | 9.65 | 8030 | 10.4 | NA | -- |
| Benz(a)anthracene | 56-55-3 | 0.21 | 2.21 | -- | 0.1 | 6% |
| Benzo(a)pyrene | 50-32-8 | 0.219 | 0.221 | -- | 1 | 58% |
| Benzo(b)fluoranthene | 205-99-2 | 0.271 | 2.21 | -- | 0.1 | 7% |
| Dibenz(a,h)anthracene | 53-70-3 | 0.076 | 0.221 | -- | 0.3 | 20% |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 0.193 | 2.21 | -- | 0.1 | 5% |
| PCB-1254 | 11097-69-1 | 0.117 | 2.03 | -- | 0.1 | 3% |
| **Sum-of-Ratios** | | | | | **2** | |
| **Non-Production Area** | | | | | | |
| Arsenic | 7440-38-2 | 14.1 | 4.25 | 15.4 | NA | -- |
| Cobalt | 7440-48-4 | 9.19 | 8030 | 10.4 | NA | -- |
| Benz(a)anthracene | 56-55-3 | 0.32 | 2.21 | -- | 0.1 | 8% |
| Benzo(a)pyrene | 50-32-8 | 0.28 | 0.221 | -- | 1 | 66% |
| Benzo(b)fluoranthene | 205-99-2 | 0.41 | 2.21 | -- | 0.2 | 10% |
| Dibenz(a,h)anthracene | 53-70-3 | 0.069 | 0.221 | -- | 0.3 | 16% |
| **Sum-of-Ratios** | | | | | **2** | |

[a]FWCUGs from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).
[b]Background criteria for surface 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).
bgs = Below ground surface.
CAS = Chemical Abstract Service.
COC = Chemical of concern.
COPC = Chemical of potential concern.
EPC = Exposure point concentration.
ft = Feet.
FWCUG = Facility-wide cleanup goal.
NA = Not applicable, arsenic and cobalt are not included in the sum-of-ratios because the EPCs are less than the background criteria.
PCB = Polychlorinated biphenyl.
**Bold** = Sum-of-ratios greater than 1.
-- = No value available

**Table G-8. COC Screening for Subsurface Soil (1-13 ft bgs Discrete Samples) at Load Line 11**
**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] HQ=1 | Resident FWCUG[a] Risk=$10^{-5}$ | Background Criteria[b] | EPC Exceeds FWCUG? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Former Production Area** | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | |
| Arsenic[c] | 7440-38-2 | 65/ 67 | 4.3 | 25.8 | 13.4 | 14.3 | N | 14.3 | 20.2 | 4.25 | 19.8 | No |
| Cobalt | 7440-48-4 | 67/ 67 | 4.5 | 27.1 | 8.93 | 9.54 | X | 9.54 | 1313 | 8030 | 23.2 | No |
| Sulfate | 14808-79-8 | 5/ 45 | 19.9 | 44.2 | 26.9 | 28.4 | D | 28.4 | -- | -- | -- | NA |
| Sulfide | 18496-25-8 | 23/ 45 | 15.1 | 161 | 32.9 | 40.6 | X | 40.6 | -- | -- | -- | NA |
| ***Pesticides/PCBs*** | | | | | | | | | | | | |
| PCB-1254 | 11097-69-1 | 4/ 19 | 0.023 | 0.79 | 0.0576 | 0.128 | D | 0.128 | 1.2 | 2.03 | -- | No |
| **Non-Production Area** | | | | | | | | | | | | |
| ***Inorganic Chemicals*** | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | 45/ 45 | 4720 | 24500 | 9790 | 10700 | L | 10700 | 73798 | -- | 19500 | No |
| Arsenic[c] | 7440-38-2 | 39/ 45 | 6 | 44.1 | 14.2 | 16.2 | X | 16.2 | 20.2 | 4.25 | 19.8 | No |
| Barium | 7440-39-3 | 45/ 45 | 19.7 | 4190 | 139 | 294 | X | 294 | 14129 | -- | 124 | No |
| Cobalt | 7440-48-4 | 45/ 45 | 3.3 | 24.7 | 8.42 | 9.33 | L | 9.33 | 1313 | 8030 | 23.2 | No |
| Cyanide | 57-12-5 | 7/ 25 | 0.0097 | 1 | 0.163 | 0.232 | D | 0.232 | 2.7 | -- | 0 | No |
| Thallium | 7440-28-0 | 19/ 45 | 0.097 | 2.5 | 0.169 | 0.258 | D | 0.258 | 6.12 | -- | 0.91 | No |
| Sulfate | 14808-79-8 | 15/ 25 | 13.6 | 44.9 | 28.1 | 30.6 | N | 30.6 | -- | -- | -- | NA |
| Sulfide | 18496-25-8 | 9/ 25 | 12.2 | 81.8 | 19.8 | 27.8 | D | 27.8 | -- | -- | -- | NA |
| ***Miscellaneous*** | | | | | | | | | | | | |
| TPH - DRO | NS791 | 1/ 15 | 34 | 34 | 5.42 | 9.03 | D | 9.03 | -- | -- | -- | NA |
| TPH - GRO | NS834 | 2/ 14 | 0.026 | 0.054 | 0.0319 | 0.0349 | D | 0.0349 | -- | -- | -- | NA |
| ***Semi-volatile Organic Compounds*** | | | | | | | | | | | | |
| Benzo(a)pyrene | 50-32-8 | 2/ 36 | 0.011 | 0.12 | 0.126 | 0.152 | D | 0.12 | -- | 0.221 | -- | No |

All units are mililgrams per kilogram (mg/kg).
[a]FWCUGs from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).
[b]Background criteria for soil >1 ft bgs from final facility-wide background values for Ravenna Army Ammunition Plant, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).
[c]Since Resident FWCUG for arsenic is less than the background level, background is used as the cleanup goal for comparison.
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.
ft = Feet.
FWCUG = Facility-wide cleanup goal.
HQ = Hazard quotient.
NA = No FWCUG available for comparison.
TPH-DRO = Total Petroleum Hydrocarbon - diesel range organics.
TPH-GRO = Total Petroleum Hydrocarbon - gasoline range organics.
UCL 95 = 95% Upper confidence limit of the mean.
**Bold** = EPC exceeds FWCUG.
-- = No value available.

**Table G-9. Sum-of-Ratios for Non-Carcinogens: COC Screening for Subsurface Soil (1-13 ft bgs) at Load Line 11**
**Unrestricted Land Use Receptor: Resident (Adult and Child)**

| COPC | CAS Number | EPC | Resident (Adult and Child) FWCUG[a] HQ = 1 | Background Criteria[b] | Ratio |
|---|---|---|---|---|---|
| **Non Production Area** | | | | | |
| Aluminum | 7429-90-5 | 10700 | 73798 | 19500 | NA |
| Arsenic[c] | 7440-38-2 | 16.2 | 20.2 | 19.8 | NA |
| Barium | 7440-47-3 | 294 | 14129 | 124 | <0.1 |
| Cobalt | 7440-48-4 | 9.33 | 1313 | 23.2 | NA |
| Cyanide | 57-12-5 | 0.232 | 2.7 | 0 | 0.1 |
| Thallium | 7439-96-5 | 0.258 | 6.12 | 0.91 | NA |
| **Sum-of-Ratios** | | | | | 0.1 |

[a]FWCUGs from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).
[b]Background 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).
bgs = Below ground surface.
CAS = Chemical Abstract Service.
COC = Chemical of concern.
COPC = Chemical of potential concern.
ft = Feet.
EPC = Exposure point concentration.
FWCUG = Facility-wide cleanup goal.
HQ = Hazard quotient.
NA = Not applicable, ratio not calculated as the EPC is less than the background criteria.
**Bold** = Sum-of-ratios greater than 1.

**Table G-10. Sum-of-Ratios for Carcinogens: COC Screening for Subsurface Soil (1-13 ft bgs Discrete Samples) at Load Line 11 Unrestricted Land Use Receptor: Resident (Adult and Child)**

| COPC | CAS Number | EPC | Resident (Adult and Child) FWCUG[a] Risk=$10^{-5}$ | Background Criteria[b] | Ratio |
|---|---|---|---|---|---|
| **Former Production Area** | | | | | |
| ***Inorganic Chemicals and Anions*** | | | | | |
| Arsenic | 7440-38-2 | 14.3 | 4.25 | 19.8 | NA |
| Cobalt | 7440-48-4 | 9.54 | 8030 | 23.2 | NA |
| PCB-1254 | 11097-69-1 | 0.128 | 2.03 | -- | <0.1 |
| **Sum-of-Ratios** | | | | | <0.1 |
| **Non-Production Area** | | | | | |
| ***Inorganic Chemicals and Anions*** | | | | | |
| Arsenic | 7440-38-2 | 16.2 | 4.25 | 19.8 | NA |
| Cobalt | 7440-48-4 | 9.33 | 8030 | 23.2 | NA |
| Benzo(a)pyrene | 50-32-8 | 0.12 | 0.221 | -- | 0.5 |
| **Sum-of-Ratios** | | | | | 0.5 |

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

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

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

bgs = Below ground surface.
CAS = Chemical Abstract Service.
COC = Chemical of concern.
COPC = Chemical of potential concern.
EPC = Exposure point concentration.
ft = Feet.
FWCUG = Facility-wide cleanup goal.
NA = Not applicable, arsenic and cobalt are not included in the sum-of-ratios because the EPCs are less than the background criteria.
PCB = Polychlorinated biphenyl.
-- = No value available.
**Bold** = Sum-of-ratios greater than 1.

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**Table G-11. COC Screening for Sediment Samples at Load Line 11**
**Unrestricted Land Use Receptor: Resident (Adult and Child)**

| | | COPC | | Aluminum | Arsenic | Chromium[c] | Cobalt[d] | Sulfide | Benzo(a)pyrene |
|---|---|---|---|---|---|---|---|---|---|
| | | CAS Number | | 7429-90-5 | 7440-38-2 | 7440-47-3 | 7440-48-4 | 18496-25-8 | 50-32-8 |
| | | Resident (Adult and Child) FWCUG[a]: | | | | | | | |
| | | HQ=1 | | 73798 | 20.2 | 81473 | 1313 | -- | -- |
| | | Risk=$10^{-5}$ | | -- | 4.25 | -- | 8080 | -- | 0.221 |
| | | Background Criteria[b] | | 13900 | 19.5 | 18.1 | 9.1 | -- | -- |
| **Sample ID** | **Date** | **Depth (ft bgs)** | **Station** | **Exceeds** | **Exceeds** | **Exceeds** | **Exceeds** | **Exceeds** | **Exceeds** |
| **East Ditch** | | | | | | | | | |
| LL11cs-031-0001-SD | 3/20/2001 | 0.0 - 1.0 | LL11cs-031 | 10600 No | ND | 16.5 No | 8.2 No | NR | NR |
| LL11sd-083-5594-SD | 02/25/10 | 0.0 - 0.5 | LL11sd-083 | 15100 No | **19.7 Yes** | 18.6 No | 17.4 No | NR | 0.098 No |
| **West Ditch** | | | | | | | | | |
| LL11cs-015-0001-SD | 3/23/2001 | 0.0 - 1.0 | LL11cs-015 | 17700 No | NA | 20.5 No | 7.9 No | NR | NA |
| LL11sd-024-0001-SD | 11/16/2000 | 0.0 - 1.0 | LL11sd-024 | 15400 No | NA | 21 No | 14.1 No | 43.4 NA | NA |
| LL11sd-084-5595-SD | 02/25/10 | 0.0 - 0.5 | LL11sd-084 | 10100 No | NA | 12.2 No | 7.1 No | NR | NA |

All units are mililgrams per kilogram (mg/kg).
[a]FWCUGs from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).
[b]Background criteria for sediment from final facility-wide background values for Ravenna Army Ammunition Plant, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).
[c]Using 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 11.
[d]No FWCUG available for cobalt in sediment. Values are FWCUGs for cobalt in soil.
[e]Detected concentration is virtually equivalent to background level so arsenic is not retained as a COC. See Section 7.2.3.4
[f]SRC with no FWCUG see Section 7.2.4.4.
bgs = Below ground surface.
CAS = Chemical Abstract Service.
COC = Chemical of concern.
COPC = Chemical of potential concern.
ft = Feet.
FWCUG = Facility-wide cleanup goal.
HQ = Hazard quotient.
ID = Identification.
NA = Not applicable, chemical is not a COPC in this exposure unit (for arsenic) or no FWCUG available for comparison (sulfide).
ND = Not detected.
NR = Not reported.
SRC = Site-related contaminant.
**Bold** = Concentration exceeds FWCUG.
-- = No value available.

**Table G-12. Sum-of-Ratios for Non-Carcinogens: COC Screening for Sediment Samples at Load Line 11**
**Unrestricted Land Use Receptor: Resident (Adult and Child)**

| | | **COPC** | | **Aluminum** | | **Arsenic** | | **Chromium** | | **Cobalt[c]** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **CAS Number** | | **7429-90-5** | | **7440-38-2** | | **7440-47-3** | | **7440-48-4** | | |
| | | **Resident (Adult and Child) FWCUG[a]:** | | | | | | | | | | |
| | | **HQ=1** | | **73798** | | **20.2** | | **81473** | | **1313** | | |
| | | **Critical effect or Target Organ** | | **Neurotoxicity in offsprin** | | **Skin** | | **NOAEL** | | **Not specified** | | |
| | | **Background Criteria[b]** | | **13900** | | **19.5** | | **18.1** | | **9.1** | | **Sum of** |
| **Sample ID** | **Date** | **Depth (ft bgs)** | **Station** | **Result** | **Ratio** | **Result** | **Ratio** | **Result** | **Ratio** | **Result** | **Ratio** | **Ratios** |
| **East Ditch** | | | | | | | | | | | | |
| LL11cs-031-0001-SD | 3/20/2001 | 0.0 - 1.0 | LL11cs-031 | 10600 | NA | ND | -- | 16.5 | NA | 8.2 | NA | NA |
| LL11sd-083-5594-SD | 02/25/10 | 0.0 - 0.5 | LL11sd-083 | 15100 | 0.2 | 19.7 | 1 | 18.6 | <0.01 | 17.4 | 0.01 | 1 |
| **West Ditch** | | | | | | | | | | | | |
| LL11cs-015-0001-SD | 3/23/2001 | 0.0 - 1.0 | LL11cs-015 | 17700 | 0.2 | NA | -- | 20.5 | <0.01 | 7.9 | NA | 0.2 |
| LL11sd-024-0001-SD | 11/16/2000 | 0.0 - 1.0 | LL11sd-024 | 15400 | 0.2 | NA | -- | 21 | <0.01 | 14.1 | 0.01 | 0.2 |
| LL11sd-084-5595-SD | 02/25/10 | 0.0 - 0.5 | LL11sd-084 | 10100 | NA | NA | -- | 12.2 | <0.01 | 7.1 | NA | <0.1 |

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

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

[b]Background 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).

[c]No FWCUG available for cobalt in sediment. Value is FWCUG for cobalt in soil.

bgs = below ground surface
CAS = Chemical Abstract Service
COC = Chemical of Concern
COPC = Chemical of Potential Concern
NA = not applicable, chemical is not a chemical of potential concern (COPC) in this exposure unit (for arsenic in the West Ditch) or the chemical concentration in that sample is less than
ND = not detected
NR = not reported
SOR = Sum-of-Ratios
-- = No value available
**Bold** = SOR greater than 1

**Table G-13. Sum-of-Ratios for Carcinogens: COC Screening for Sediment Samples at Load Line 11**
**Unrestricted Land Use Receptor: Resident (Adult and Child)**

| | | **COPC** | | **Arsenic[c]** | | **Cobalt[d]** | | **Benzo(a)pyrene** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **CAS Number** | | **7440-38-2** | | 7440-48-4 | | 50-32-8 | | |
| | | **Resident FWCUG[a]:** | | | | | | | | |
| | | **Risk=$10^{-5}$** | | 4.25 | | 8080 | | 0.221 | | |
| | | **Background Criteria[b]** | | 19.5 | | 9.1 | | None | | |
| **Sample ID** | **Date** | **Depth (ft bgs)** | **Station** | **Result** | **Ratio** | **Result** | **Ratio** | **Result** | **Ratio** | **SOR** |
| **East Ditch** | | | | | | | | | | |
| LL11cs-031-0001-SD | 3/20/2001 | 0.0 - 1.0 | LL11cs-031 | ND | -- | 8.2 | <0.01 | NR | -- | <0.1 |
| LL11sd-083-5594-SD | 02/25/10 | 0.0 - 0.5 | LL11sd-083 | 19.7 | 1 | 17.4 | <0.01 | 0.098 | 0.4 | 1 |
| **West Ditch** | | | | | | | | | | |
| LL11cs-015-0001-SD | 3/23/2001 | 0.0 - 1.0 | LL11cs-015 | NA | -- | 7.9 | <0.01 | NA | -- | <0.1 |
| LL11sd-024-0001-SD | 11/16/2000 | 0.0 - 1.0 | LL11sd-024 | NA | -- | 14.1 | <0.01 | NA | -- | <0.1 |
| LL11sd-084-5595-SD | 02/25/10 | 0.0 - 0.5 | LL11sd-084 | NA | -- | 7.1 | <0.01 | NA | -- | <0.1 |

All units are mililgrams per kilogram (mg/kg).
[a]FWCUGs from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).
[b]Background criteria for sediment from final facility-wide background values for Ravenna Army Ammunition Plant, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).
[c]Since Resident FWCUG for arsenic is less than the background level, background is used as the cleanup goal for comparison.
[d]No FWCUG available for cobalt in sediment. Value is FWCUG for cobalt in soil.
bgs = Below ground surface.
CAS = Chemical Abstract Service.
COC = Chemical of concern.
COPC = Chemical of potential concern.
ft = Feet.
FWCUG = Facility-wide cleanup goal.
HQ = Hazard quotient.
ID = Identification.
NA = Not applicable, chemical is not a COPC in this exposure unit.
ND = Not detected.
NOAEL = No-observed-adverse-effect-level.
NR = Not reported.
-- = No value available.
**Bold** = Sum-of-ratios greater than 1.

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**Table G-14. COC Screening for Surface Water at Load Line 11**
**Unrestricted Land Use Receptor: Resident (Adult and Child)**

| | **COPC** | | **Arsenic** | **Cobalt** | **Benz(a)anthracene** | **Benzo(a)pyrene** | **Benzo(b)fluoranthene** | **Indeno(1,2,3-cd)pyrene** |
|---|---|---|---|---|---|---|---|---|
| | **CAS Number** | | 7440-38-2 | 7440-48-4 | 56-55-3 | 50-32-8 | 205-99-2 | 193-39-5 |
| | **Resident (Adult and Child) FWCUG[a]:** | | | | | | | |
| | **HQ=1** | | 0.0463 | 0.006 | -- | -- | -- | -- |
| | **Risk=$10^{-5}$** | | 0.011 | -- | 0.0001 | 8.00E-06 | 0.0001 | 0.0001 |
| | **Background Criteria[b]** | | 0.0032 | 0 | -- | -- | -- | -- |
| **Sample ID** | **Date** | **Station** | **Result Exceeds FWCUG?** | **Result Exceeds FWCUG?** | **Result Exceeds FWCUG?** | **Result Exceeds FWCUG?** | **Result Exceeds FWCUG?** | **Result Exceeds FWCUG?** |
| **West Ditch** | | | | | | | | |
| LL11sw-084-5610-SW | 2/25/2010 | LL11sw-084 | 0.0043J No | 0.0019J No | **0.00035 J Yes** | **0.00033J Yes** | **0.00041J Yes** | **0.00021J Yes** |

All units are milligrams per liter (mg/L).
[a]FWCUGs from *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).
[b]Background criteria for surface water from final facility-wide background values for Ravenna Army Ammunition Plant, published in the *Final Phase II Remedial Investigation Report for Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2001).
Data Qualifiers: J=estimated
CAS = Chemical Abstract Service.
COC = Chemical of concern.
COPC = Chemical of potential concern.
FWCUG = Facility-wide cleanup goal.
HQ = Hazard quotient.
ID = Identification.
-- = No value available.
**Bold** = Concentration exceeds FWCUG

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**Table G-15. Sum-of-Ratios for Non-Carcinogens: COC Screening for Surface Water at Load Line 11**
**Unrestricted Land Use Receptor: Resident (Adult and Child)**

| | **COPC** | | **Arsenic** | | **Cobalt** | | |
|---|---|---|---|---|---|---|---|
| | **CAS Number** | | **7440-38-2** | | **7440-48-4** | | |
| | **Resident (Adult and Child) FWCUG[a]:** | | | | | | |
| | | **HQ=1** | **0.0463** | | **0.006** | | |
| | **Critical effect or Target Organ** | | **Skin** | | **Not Specified** | | |
| | **Background Criteria[b]** | | 0.0032 | | 0 | | |
| **Sample ID** | **Date** | **Station** | **Result** | **Ratio** | **Result** | **Ratio** | **SOR** |
| **West Ditch** | | | | | | | |
| LL11sw-084-5610-SW | 2/25/2010 | LL11sw-084 | 0.0043 | 0.1 | 0.0019 | 0.3 | 0.4 |

All units are milligrams per liter (mg/L).

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

[b]Background criteria for surface water from final facility-wide background values for Ravenna Army Ammunition Plant, 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

COC = Chemical of concern

COPC = Chemical of potential concern.

FWCUG = Facility-wide cleanup goal.

HQ = Hazard quotient

ID = Identification.

**Bold = Sum-of-ratios greater than 1**

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**Table G-16. Percent Contribution to Sum-of-Ratios for Carcinogens: COC Screening for Surface Water at Load Line 11**
**Unrestricted Land Use Receptor: Resident (Adult and Child)**

| | **COPC** | | **Arsenic** | | | **Benz(a)anthracene** | | | **Benzo(a)pyrene** | | | **Benzo(b)fluoranthene** | | | **Indeno(1,2,3-cd)pyrene** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **CAS Number** | | **7440-38-2** | | | **56-55-3** | | | **50-32-8** | | | **205-99-2** | | | **193-39-5** | | | |
| | **Resident (Adult and Child) FWCUG[a]:** | | | | | | | | | | | | | | | | | |
| | **Risk=$10^{-5}$** | | **0.011** | | | **0.0001** | | | **8.00E-06** | | | **0.0001** | | | **0.0001** | | | |
| | **Background Criteria[b]** | | **0.0032** | | | **--** | | | **--** | | | **--** | | | **--** | | | |
| **Sample ID** | **Date** | **Station** | **Result** | **Ratio** | **Percent Contribution to SOR>1** | **Result** | **Ratio** | **Percent Contribution to SOR>1** | **Result** | **Ratio** | **Percent Contribution to SOR>1** | **Result** | **Ratio** | **Percent Contribution to SOR>1** | **Result** | **Ratio** | **Percent Contribution to SOR>1** | **SOR** |
| **West Ditch** | | | | | | | | | | | | | | | | | | |
| LL11sw-084-5610-9 | 2/25/2010 | LL11sw-084 | 0.0043 | 0.4 | 0.8% | 0.0004 | 4 | 7% | 0.00033 | 41 | 80% | 0.0004 | 4 | 8% | 0.00021 | 2 | 4% | **51** |

All units are milligrams per liter (mg/L).

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

[b]Background criteria for surface water from final facility-wide background values for Ravenna Army Ammunition Plant, 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.

COC = Chemical of concern.

COPC = Chemical of potential concern

FWCUG = Facility-wide cleanup goal.

ID = Identification.

SOR = Sum-of-ratios.

-- = No value available

**Bold = SOR greater than 1**

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