

APPENDIX H
PRELIMINARY RISK ASSESSMENT

Technical Memorandum

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To: Artillery and Mortar Impact Areas south of Bains Gap Road, Main Post, Parcels 138Q-X, 139Q-X, 140Q-X, 141Q-X, 142Q0X, Fort McClellan
Preliminary Risk Assessment File

Date: 11 April 2002

Subject: **PRELIMINARY RISK ASSESSMENT FOR SUBJECT SITE: REVISION 1**

This memorandum provides a Preliminary Risk Assessment (PRA) for exposure to surface soil, subsurface soil, seep water, surface water and sediment at the Artillery and Mortar Impact Areas south of Bains Gap Road, hereinafter referred to as the Impact Areas. The PRA approach is a shortened version of the Streamlined Risk Assessment (SRA) protocol developed as a uniform and economical approach to evaluating hundreds of similar sites at Fort McClellan (FTMC). It is assumed that the reader is familiar with FTMC and the fundamentals of the SRA protocol. The reader is referred to the Installation-Wide Work Plan (IT, 1998) for more detail. All the comparison and computational operations of the PRA are performed within EXCEL[®] spread sheet tables. The results of each step are described below.

Media of Interest and Data Selection. Data consist of 19 surface soil samples analyzed for metals, nitroaromatic compounds and perchlorate, and 14 subsurface soil samples, 3 seep water samples, 7 surface water samples and 7 sediment samples analyzed for metals only. The validated data are summarized in Tables 5-1 through 5-5 from the Site Investigation (SI). The seep water is evaluated as groundwater, since it is formed by the discharge of groundwater to the surface.

Site-Related Chemical Selection. Site-related chemicals are those presumed to be released because of activities performed by the army during operation of FTMC. They are identified in Table 1 (surface soil), Table 2 (subsurface soil), Table 3 (seep water), Table 4 (surface water) and Table 5 (sediment) by comparing the maximum detected concentration (MDC) of each chemical with its background screening criterion (BSC), computed as two times the mean of the background data set, in accordance with EPA (2001) Region IV guidance. BSCs were taken from Tables 5-1 through 5-5 from the SI. Upper tolerance limits (UTL), the highest metal concentrations reasonably considered to be within background, are also included in Tables 1 through 5 for information, but were not used to select site-related chemicals. The UTL provides a more refined statistical approach than the BSC for comparing site and background data. UTLs were developed for the entire FTMC facility, combining data from the Main Post and Pelham Range. The UTLs for total soil were adopted for subsurface soil. The UTLs for groundwater were adopted for seep water.

Chemical of Potential Concern Selection. Chemicals of potential concern (COPC) are site-related chemicals whose MDCs exceed their site-specific screening levels (SSSL), and which

may contribute significantly to risk. The SSSLs are receptor-, medium-, and chemical-specific risk-based concentrations that capture all the exposure assumptions and toxicity assessment of a full-blown baseline risk assessment. COPCs are selected for both cancer risk and noncancer effects when the data permit (Tables 1 through 5).

Receptor Scenario Selection. The proposed land reuse plan states that the Impact Areas will be used for passive recreation. The most plausible receptor is a recreational site user. An on-site resident is also included as the upper-bound evaluation of exposure and risk, and to provide additional perspective. SSSLs for both receptor scenarios were used to select COPCs for surface and subsurface soil. As stated before, seep water was evaluated as groundwater. It is assumed that groundwater may be developed for potable use. The resident, but not the recreational site user, is assumed to be exposed to groundwater; therefore, only the resident was used for COPC selection for seep water. The assumptions for residential and recreational site user exposure to surface water and sediment are identical; therefore, only the recreational site user SSSLs were used for COPC selection for surface water and sediment.

Risk Characterization. Risk characterization combines the exposure assumptions and toxicity assessment (incorporated in the SSSLs) with the exposure-point concentration (EPC) to quantify the incremental lifetime cancer risk (ILCR) and noncancer hazard index (HI). ILCR and HI estimates are computed for each chemical in each medium, and are summed to yield a total ILCR and total HI for each receptor scenario. The PRA differs from an SRA in that no attempt is made to estimate an EPC that reflects a conservative estimate of average concentration for use in risk assessment. The 95 percent upper confidence limit on the mean (UCL) is usually used for this purpose. Instead, the MDC is adopted as the EPC, which imparts a conservative bias to the PRA.

The only plausible receptor scenario for the Impact Areas is the recreational site user. No chemicals were selected as COPCs for recreational site user exposure to surface soil (Table 1), subsurface soil (Table 2) or sediment (Table 5); therefore, neither an ILCR nor an HI were estimated for this receptor. Lead was selected as the only COPC in surface water because its MDC ($2.08\text{E-}2$ mg/L) exceeds its SSSL ($1.5\text{E-}2$ mg/L) (Table 4). The SSSL, however, is the action level for lead in tap water (EPA, 2000). Since the incidental nature of exposure to surface water is expected to be far less intense than exposure to tap water, the SSSL of $1.5\text{E-}2$ mg/L is deemed to be far too conservative. Furthermore, the MDC of lead in surface water is below the UTL and within the range of background (data not shown) (SAIC, 1998). Therefore, lead in surface water is deemed to reflect background conditions rather than a site-related release. It is concluded that recreational site user exposure to surface soil, subsurface soil, surface water and sediment at the Impact Areas is unlikely to result in unacceptable cancer risk or adverse noncancer health effects.

The on-site resident was also evaluated as the upper-bound on exposure and risk and to provide additional perspective. COPCs selected for residential exposure to surface soil include aluminum, antimony, iron and manganese (Table 1). No COPCs were selected for cancer risk; therefore, no ILCR was estimated for exposure to surface soil. The total HI for exposure to surface soil of $2.85\text{E}+0$ exceeds the threshold value of 1. The MDCs for iron and manganese, however, fall below their respective UTLs and within the range of background (data not shown) (SAIC, 1998), and it was judged that the presence of these metals reflects background conditions.

The situation with aluminum is not so clear. The MDC for aluminum ($2.17\text{E}+4$ mg/kg) slightly exceeds its UTL ($2.14\text{E}+4$ mg/kg), but falls within the range of background ($2.40\text{E}+3$ to $3.99\text{E}+4$ mg/kg). It is not unreasonable to suspect that aluminum could be a site-related chemical in soil at an artillery impact area. In order to be appropriately protective, it is concluded that concentrations of aluminum and antimony in surface soil represent site-related releases. Therefore, the HI of $5.48\text{E}-1$, the sum of the HIs for aluminum and antimony, is attributed to exposure to surface soil.

COPCs selected for residential exposure to subsurface soil are limited to aluminum and antimony (Table 2). No COPCs were selected for cancer risk; therefore, no ILCR was estimated for exposure to subsurface soil. The total HI for exposure to subsurface soil of $5.66\text{E}-1$ falls below the threshold value of 1. Both aluminum and antimony appear to be site-related metals in subsurface soil, consistent with the findings in surface soil.

COPCs for residential exposure to seep water (evaluated as groundwater – a source of potable water for household use) are limited to barium and lead. No COPCs were selected for cancer risk; therefore, no ILCR was estimated for exposure to seep water. The total HI for exposure to seep water of $1.27\text{E}-1$, due to barium alone, falls below the threshold value of 1. The MDC for barium, however, falls below its UTL and within the range of background (data not shown) (SAIC, 1998), and it is judged that barium in seep water reflects background conditions in groundwater.

The resident theoretically could be exposed to surface soil, subsurface soil, seep water (groundwater), surface water and sediment. As noted above, residential exposure to surface water and sediment would be identical to that of the recreational site user. COPCs were not selected in surface water or sediment for the recreational site user; therefore, these media are not considered further in the residential evaluation. Aluminum and antimony were selected as site-related COPCs in both surface and subsurface soils. It is not plausible that a resident would be simultaneously exposed to the MDCs in both surface and subsurface soil. However, the HIs for each chemical in each medium are summed for the sake of simplicity. Therefore, the total HI for exposure to aluminum in surface and subsurface soil is $6.00\text{E}-1$, and the total HI for exposure to antimony is $5.15\text{E}-1$. Both fall below the threshold level of 1. The HIs for aluminum and antimony should not be added because the chemicals do not share a common target organ (please see toxicity profiles appended to IT [2000]).

It is concluded that exposure to surface soil, subsurface soil, surface water and sediment poses no unacceptable risk for the resident. Lead in seep water (groundwater), however, appears to reflect a site-related release that exceeds the action level in tap water. The Impact Areas can be released for recreational site use requiring no further action. The soil, surface water and sediment at the Impact Areas can be released for residential or unrestricted use requiring no further action. Further action is required, however, if the groundwater were to be developed as a source of potable water.

Post-Script. The foregoing identifies lead in seep water as the only chemical of concern for human health in any medium at the Impact Areas. Lead, however, is not expected to be site-related at Impact Areas, because lead is not a component of the artillery and mortar ordnance

used at this site. Consequently, the three seeps were re-sampled on 10 January 2002, taking special care to ensure that sediment was not incorporated into the sample. The samples were analyzed only for lead. Lead concentrations ranged from 2.00E-3 to 4.37E-3 mg/L. All concentrations fell below the background screening criterion of 8.67E-3 mg/L and below the SSSL for residential exposure of 1.50E-2 mg/L. Although it is not entirely clear why the initial (2 May 2001) seep samples yielded higher lead concentrations, more careful sampling showed that lead is not a chemical of concern in seep water.

It is concluded that exposure to soil, groundwater, surface water and sediment poses no unacceptable risk for the resident. The Impact Areas can be released for unrestricted use with no further action.

References

IT Corporation (IT), 1998, ***Installation-Wide Work Plan***, Final, Fort McClellan, Calhoun County, Alabama, Prepared for U.S. Army Corps of Engineers, Mobile District, August*

IT Corporation (IT), 2000, ***Human Health and Ecological Screening Values and PAH Background Summary Report***, Final, Fort McClellan, Calhoun County, Alabama, Prepared for U.S. Army Corps of Engineers, Mobile District, August.

Science Applications International Corporation (SAIC), 1998, ***Final Background Metals Survey Report***, prepared for U.S. Army Corps of Engineers, Mobile District, July.

Environmental Protection Agency (EPA), 2000, ***Drinking Water Standards and Health Advisories***, Office of Water, Washington, DC, EPA 822-B-00-001, Summer.

U.S. Environmental Protection Agency (EPA), 2001, ***Region 4 Human Health Risk Assessment Bulletins – Supplement to RAGS, Interim Human Health Risk Assessment Bulletins***, Waste Management Division, EPA Region 4, Atlanta, GA, on line.

*Note: the Installation-Wide Work Plan was revised in February 2002 but has not yet been released for distribution. The description of the protocol and application of the SRA, however, was not substantively changed.

Table 1

Preliminary Risk Evaluation for Exposure to Surface Soil
Impact Areas - Main Post

Fort McClellan, Calhoun County, Alabama

				Site- Related	Res Soil	Res Soil	Res Cancer	Res Noncancer	Res	Res	Res Soil	Res Soil	Rec Cancer	Rec Noncancer	Rec	Rec
Chemical	MDC	BSC	UTL	Chemical? ^a	SSSL-c ^b	SSSL-n ^c	COPC? ^d	COPC? ^e	ILCR ^f	HI ^g	SSSL-c ^h	SSSL-n ⁱ	COPC? ^d	COPC? ^e	ILCR ^j	HI ^k
METALS																
Aluminum	2.17E+04	1.63E+04	2.14E+04	2.17E+04		7.80E+03		2.17E+04		2.78E-01		6.27E+05				
Antimony	8.40E+00	1.99E+00	2.64E+00	8.40E+00		3.11E+00		8.40E+00		2.70E-01		2.47E+02				
Arsenic	6.50E+00	1.37E+01	2.54E+01		4.26E-01	2.34E+00					2.94E+01	1.89E+02				
Barium	4.88E+02	1.24E+02	1.94E+02	4.88E+02		5.47E+02						4.41E+04				
Beryllium	3.10E+00	8.00E-01	8.68E-01	3.10E+00		9.60E+00						4.08E+02				
Calcium	1.67E+03	1.72E+03	3.54E+03													
Chromium	1.72E+01	3.70E+01	6.44E+01			2.32E+01						1.82E+03				
Cobalt	3.68E+01	1.52E+01	3.25E+01	3.68E+01		4.68E+02						3.75E+04				
Copper	1.19E+01	1.27E+01	2.25E+01			3.13E+02						2.52E+04				
Iron	3.90E+04	3.42E+04	5.54E+04	3.90E+04		2.34E+03		3.90E+04		1.67E+00		1.89E+05				
Lead	3.77E+01	4.01E+01	6.38E+01			4.00E+02						4.00E+02				
Magnesium	1.23E+03	1.03E+03	9.60E+03	1.23E+03												
Manganese	2.29E+03	1.58E+03	4.66E+03	2.29E+03		3.63E+02		2.29E+03		6.31E-01		2.85E+04				
Mercury	9.50E-02	8.00E-02	3.22E-01	9.50E-02		2.33E+00						1.84E+02				
Nickel	9.93E+00	1.03E+01	2.00E+01			1.54E+02						1.20E+04				
Potassium	2.89E+03	8.00E+02	6.01E+03	2.89E+03												
Sodium	4.51E+01	6.34E+02	5.63E+02													
Thallium	1.23E+00	3.43E+00	4.53E-01			5.08E-01						4.10E+01				
Vanadium	2.49E+01	5.88E+01	9.94E+01			5.31E+01		9.94E+01				4.00E+03				
Zinc	5.94E+01	4.06E+01	7.37E+01	5.94E+01		2.34E+03						1.88E+05				
NITROAROMATICS																
2-Amino-4,6-dinitrotoluene	1.60E-01	NA				4.64E-01						3.66E+01				
PERCHLORATE																
Perchlorate	3.19E-02	NA				7.04E+00						5.69E+02				
Total ILCR, HI										2.85E+00						

All concentrations expressed as mg/kg.

MDC = maximum detected concentration; BSC = background screening criterion; UTL = 95% upper tolerance limit (incorporates data from Main Post and Pelham Range).

^a MDC presented only if it exceeds BSC.

^b Site-specific screening level based on cancer risk for residential exposure to soil.

^c Site-specific screening level based on noncancer hazard for residential exposure to soil.

^d MDC presented only if it exceeds SSSL-c.

^e MDC presented only if it exceeds SSSL-n.

^f Incremental lifetime cancer risk for resident exposed to chemical in soil.

^g Hazard index for noncancer effects for resident exposed to chemical in soil.

^h Site-specific screening level based on cancer risk for recreational site user exposure to soil.

ⁱ Site-specific screening level based on noncancer hazard for recreational site user exposure to soil.

^j Incremental lifetime cancer risk for recreational site user exposed to chemical in soil.

^k Hazard index for noncancer effects for recreational site user exposed to chemical in soil.

Table 2

Preliminary Risk Evaluation to Subsurface Soil
Impact Areas - Main Post

Fort McClellan, Calhoun County, Alabama

				Site- Related	Res Soil	Res Soil	Res Cancer	Res Noncancer	Res	Res	Res Soil	Res Soil	Rec Cancer	Rec Noncancer	Rec	Rec
Chemical	MDC	BSC	UTL	Chemical? ^a	SSSL-c ^b	SSSL-n ^c	COPC? ^d	COPC? ^e	ILCR ^f	HI ^g	SSSL-c ^h	SSSL-n ⁱ	COPC? ^d	COPC? ^e	ILCR ^j	HI ^k
METALS																
Aluminum	2.51E+04	1.36E+04	1.80E+04	2.51E+04		7.80E+03		2.51E+04		3.22E-01		6.27E+05				
Antimony	7.61E+00	1.31E+00	2.64E+00	7.61E+00		3.11E+00		7.61E+00		2.45E-01		2.47E+02				
Arsenic	7.38E+00	1.83E+01	3.24E+01		4.26E-01	2.34E+00					2.94E+01	1.89E+02				
Barium	1.27E+02	2.34E+02	2.42E+02			5.47E+02						4.41E+04				
Beryllium	1.14E+00	8.60E-01	1.50E+00	1.14E+00		9.60E+00						4.08E+02				
Calcium	1.24E+02	6.37E+02	2.41E+03													
Chromium	3.23E+01	3.83E+01	5.63E+01			2.32E+01						1.82E+03				
Cobalt	2.57E+01	1.75E+01	3.63E+01	2.57E+01		4.68E+02						3.75E+04				
Copper	1.21E+01	1.94E+01	2.59E+01			3.13E+02						2.52E+04				
Iron	3.81E+04	4.48E+04	5.63E+04			2.34E+03						1.89E+05				
Lead	1.17E+01	3.85E+01	6.05E+01			4.00E+02						4.00E+02				
Magnesium	1.07E+03	7.66E+02	5.54E+03	1.07E+03												
Manganese	7.78E+02	1.36E+03	4.12E+03			3.63E+02						2.85E+04				
Mercury	4.20E-02	7.00E-02	1.71E-01			2.33E+00						1.84E+02				
Nickel	8.42E+00	1.29E+01	2.07E+01			1.54E+02						1.20E+04				
Potassium	4.79E+03	7.11E+02	5.78E+03	4.79E+03												
Silver	5.06E-01	2.40E-01	8.51E-01	5.06E-01		3.91E+01						3.16E+03				
Sodium	3.75E+01	7.02E+02	6.23E+02													
Thallium	8.17E-01	1.40E+00	6.62E+00			5.08E-01						4.10E+01				
Vanadium	5.01E+01	6.49E+01	9.05E+01			5.31E+01						4.00E+03				
Zinc	2.56E+01	3.49E+01	7.13E+01			2.34E+03						1.88E+05				
Total ILCR, HI										5.66E-01						

All concentrations expressed as mg/kg.

MDC = maximum detected concentration; BSC = background screening criterion; UTL = 95% upper tolerance limit (values for Total Soil; incorporates data from Main Post and Pelham Range).

VOCs = volatile organic compounds.

^a MDC presented only if it exceeds BSC.

^b Site-specific screening level based on cancer risk for residential exposure to soil.

^c Site-specific screening level based on noncancer hazard for residential exposure to soil.

^d MDC presented only if it exceeds SSSL-c.

^e MDC presented only if it exceeds SSSL-n.

^f Incremental lifetime cancer risk for resident exposed to chemical in soil.

^g Hazard index for noncancer effects for resident exposed to chemical in soil.

^h Site-specific screening level based on cancer risk for recreational site user exposure to soil.

ⁱ Site-specific screening level based on noncancer hazard for recreational site user exposure to soil.

^j Incremental lifetime cancer risk for recreational site user exposed to chemical in soil.

^k Hazard index for noncancer effects for recreational site user exposed to chemical in soil.

Table 3

Preliminary Risk Evaluation for Exposure to Seep Water
Impact Areas - Main Post

Fort McClellan, Calhoun County, Alabama

				Site- Related	Res GW	Res GW	Res Cancer	Res Noncancer	Res	Res
Chemical	MDC	BSC	UTL	Chemical? ^a	SSSL-c ^b	SSSL-n ^c	COPC? ^d	COPC? ^e	ILCR ^f	HI ^g
METALS										
Aluminum	2.19E+00	5.26E+00	9.60E+00			1.56E+00				
Barium	1.40E-01	7.53E-02	4.72E-01	1.40E-01		1.10E-01		1.40E-01		1.27E-01
Beryllium	6.50E-04	3.90E-04	2.37E-03	6.50E-04		3.13E-03				
Calcium	5.92E-01	2.52E+01	4.52E+02							
Copper	1.31E-02	1.27E-02	2.35E-01	1.31E-02		6.26E-02				
Iron	3.78E+00	1.96E+01	2.58E+01			4.69E-01				
Lead	4.53E-02	8.67E-03	2.58E-02	4.53E-02		1.50E-02		4.53E-02		
Magnesium	3.64E-01	1.10E+01	1.49E+02							
Manganese	2.42E-02	5.65E-01	4.13E+00			7.35E-02				
Potassium	3.25E+00	2.56E+00	6.85E+01	3.25E+00						
Sodium	1.08E+00	3.44E+00	4.90E+01							
Vanadium	4.05E-03	1.52E-02	1.14E-02			1.10E-02				
Zinc	1.10E-02	4.03E-02	1.52E+00			4.69E-01				
Total ILCR, HI										1.27E-01

All concentrations expressed as mg/L.

MDC = maximum detected concentration; BSC = background screening criterion; UTL = 95% upper tolerance limit).
(values for ground water; incorporates data from Main Post and Pelham Range).

^a MDC presented only if it exceeds BSC.

^b Site-specific screening level based on cancer risk for residential exposure to groundwater.

^c Site-specific screening level based on noncancer hazard for residential exposure to groundwater.

^d MDC presented only if it exceeds SSSL-c.

^e MDC presented only if it exceeds SSSL-n.

^f Incremental lifetime cancer risk for resident exposed to chemical in groundwater.

^g Hazard index for noncancer effects for resident exposed to chemical in groundwater.

Table 4

Preliminary Risk Evaluation for Exposure to Surface Water
Impact Areas - Main Post

Fort McClellan, Calhoun County, Alabama

				Site- Related	Rec SW	Rec SW	Rec Cancer	Rec Noncancer	Rec	Rec
Chemical	MDC	BSC	UTL	Chemical? ^a	SSSL-c ^b	SSSL-n ^c	COPC? ^d	COPC? ^e	ILCR ^f	HI ^g
METALS										
Aluminum	5.96E-01	5.26E+00	1.70E+01			1.53E+01				
Barium	3.55E-02	7.53E-02	1.13E-01			1.10E+00				
Calcium	3.28E-01	2.52E+01	6.41E+01							
Copper	1.08E-02	1.27E-02	7.16E-02			6.23E-01				
Iron	7.79E-01	1.96E+01	4.12E+01			4.70E+00				
Lead	2.08E-02	8.67E-03	4.73E-02	2.08E-02		1.50E-02		2.08E-02		
Magnesium	3.73E-01	1.10E+01	2.44E+01							
Manganese	6.45E-02	5.65E-01	1.83E+00			6.40E-01				
Nickel	1.09E-02	2.24E-02	7.01E-02			3.10E-01				
Potassium	2.94E+00	2.56E+00	4.25E+00	2.94E+00						
Selenium	1.75E-03			1.75E-03		7.82E-02				
Sodium	1.08E+00	3.44E+00	1.52E+01							
Zinc	8.66E-03	4.03E-02	1.82E-01			4.65E+00				
Total ILCR, HI										

All concentrations expressed as mg/L.

MDC = maximum detected concentration; BSC = background screening criterion; UTL = 95% upper tolerance limit (incorporates data from Main Post and Pelham Range).

^a MDC presented only if it exceeds BSC.

^b Site-specific screening level based on cancer risk for recreational site user exposure to surface water.

^c Site-specific screening level based on noncancer hazard for recreational site user exposure to surface water.

^d MDC presented only if it exceeds SSSL-c.

^e MDC presented only if it exceeds SSSL-n.

^f Incremental lifetime cancer risk for recreational site user exposed to chemical in surface water.

^g Hazard index for noncancer effects for recreational site user exposed to chemical in surface water.

Table 5

**Preliminary Risk Evaluation for Exposure to Sediment
Impact Areas - Main Post**

Fort McClellan, Calhoun County, Alabama

Chemical	MDC	BSC	UTL	Site-	Rec SD	Rec SD	Rec	Rec	Rec	Rec
				Related						
METALS										
Aluminum	7.57E+03	8.59E+03	1.43E+04			1.15E+06				
Arsenic	6.74E+00	1.13E+01	2.01E+01		5.58E+01	3.59E+02				
Barium	1.26E+02	9.89E+01	1.91E+02	1.26E+02		8.36E+04				
Beryllium	1.06E+00	9.70E-01	1.24E+00	1.06E+00		1.50E+02				
Calcium	3.59E+02	1.11E+03	2.81E+03							
Chromium	2.37E+01	3.12E+01	6.33E+01			2.79E+03				
Cobalt	8.50E+00	1.10E+01	2.19E+01			6.72E+04				
Copper	1.17E+01	1.71E+01	3.68E+01			4.74E+04				
Iron	3.54E+04	3.53E+04	5.19E+04	3.54E+04		3.59E+05				
Lead	8.93E+01	3.78E+01	7.64E+01	8.93E+01		4.00E+02				
Magnesium	3.36E+02	9.06E+02	2.20E+03							
Manganese	3.30E+02	7.12E+02	2.05E+03			4.38E+04				
Nickel	5.13E+00	1.30E+01	3.16E+01			1.76E+04				
Potassium	2.03E+03	1.01E+03	2.79E+03	2.03E+03						
Thallium	1.27E+00	1.30E-01	2.11E-01	1.27E+00		7.78E+01				
Vanadium	2.02E+01	4.09E+01	6.67E+01			4.83E+03				
Zinc	1.75E+01	5.27E+01	1.11E+02			3.44E+05				
Total ILCR, HI										

All concentrations expressed as mg/kg.

MDC = maximum detected concentration; BSC = background screening criterion; UTL = 95% upper tolerance limit (incorporates data from Main Post and Pelham Range).

^a MDC presented only if it exceeds BSC.

^b Site-specific screening level based on cancer risk for recreational site user exposure to sediment.

^c Site-specific screening level based on noncancer hazard for recreational site user exposure to sediment.

^d MDC presented only if it exceeds SSSL-c.

^e MDC presented only if it exceeds SSSL-n.

^f Incremental lifetime cancer risk for recreational site user exposed to chemical in sediment.

^g Hazard index for noncancer effects for recreational site user exposed to chemical in sediment.