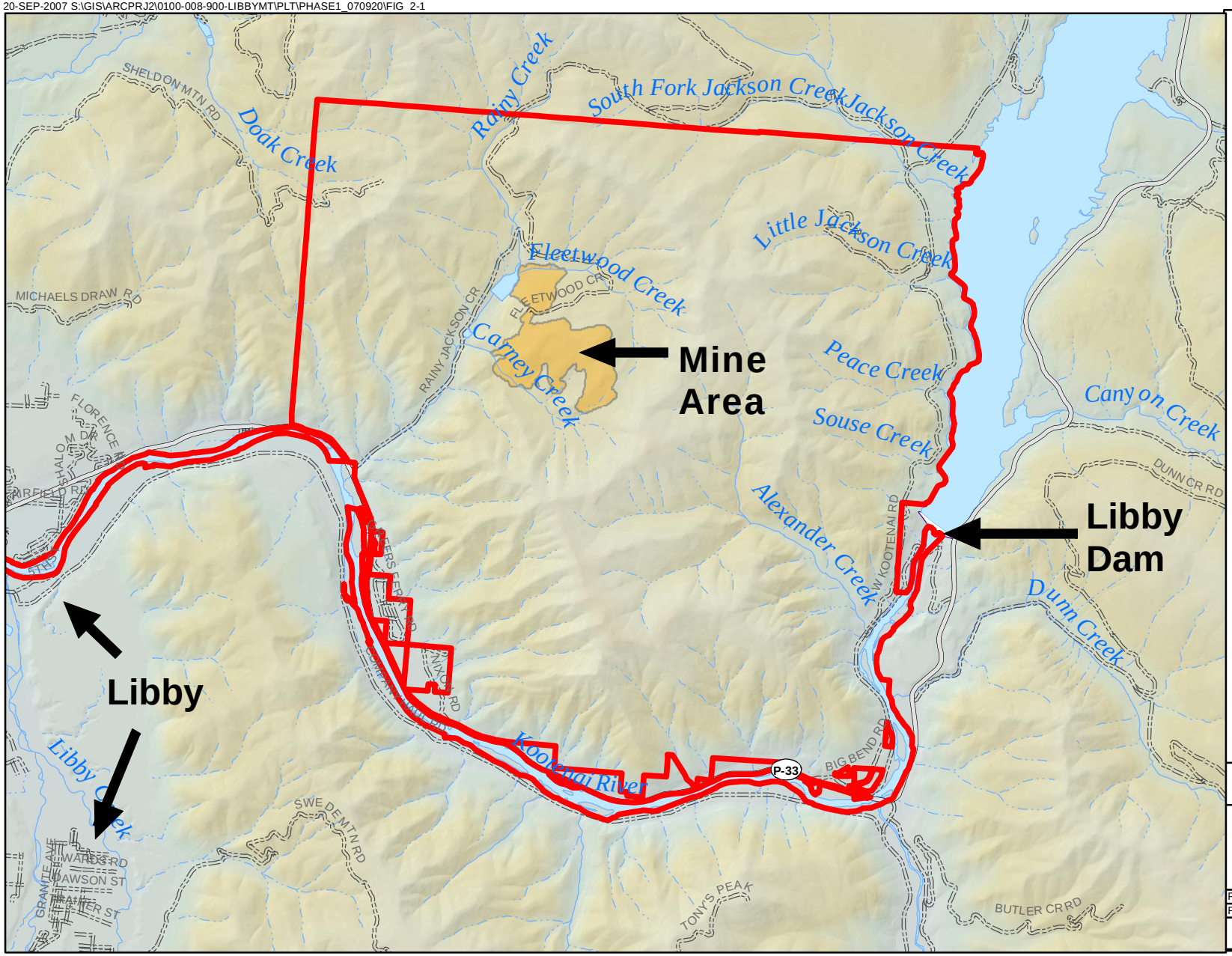
20-SEP-2007 S:\GIS\ARCPRJ2\0100-008-900-LIBBYMT\PLT\PHASE1_070920\FIG 2-1



Legend

- Mined Area
- Open Water
- County Road
- Primary Road
- Perennial Stream
- Intermittent Stream
- Preliminary Operable Unit 3 Boundary

Libby Montana Superfund Site
Operable Unit 3

FIGURE 2-1

Operable Unit 3

PROJECT: 0100-008-900	DATE: AUG 02, 2007	
REV: 0	BY:	CHECKED: ACK

Legend

- Surface Water/Sediment Sampling Location
- County Road
- Primary Road
- Open Water
- Perennial Stream
- Intermittent Stream

N

0 2,000 4,000

LIBBY MONTANA SUPERFUND SITE
OPERABLE UNIT 3

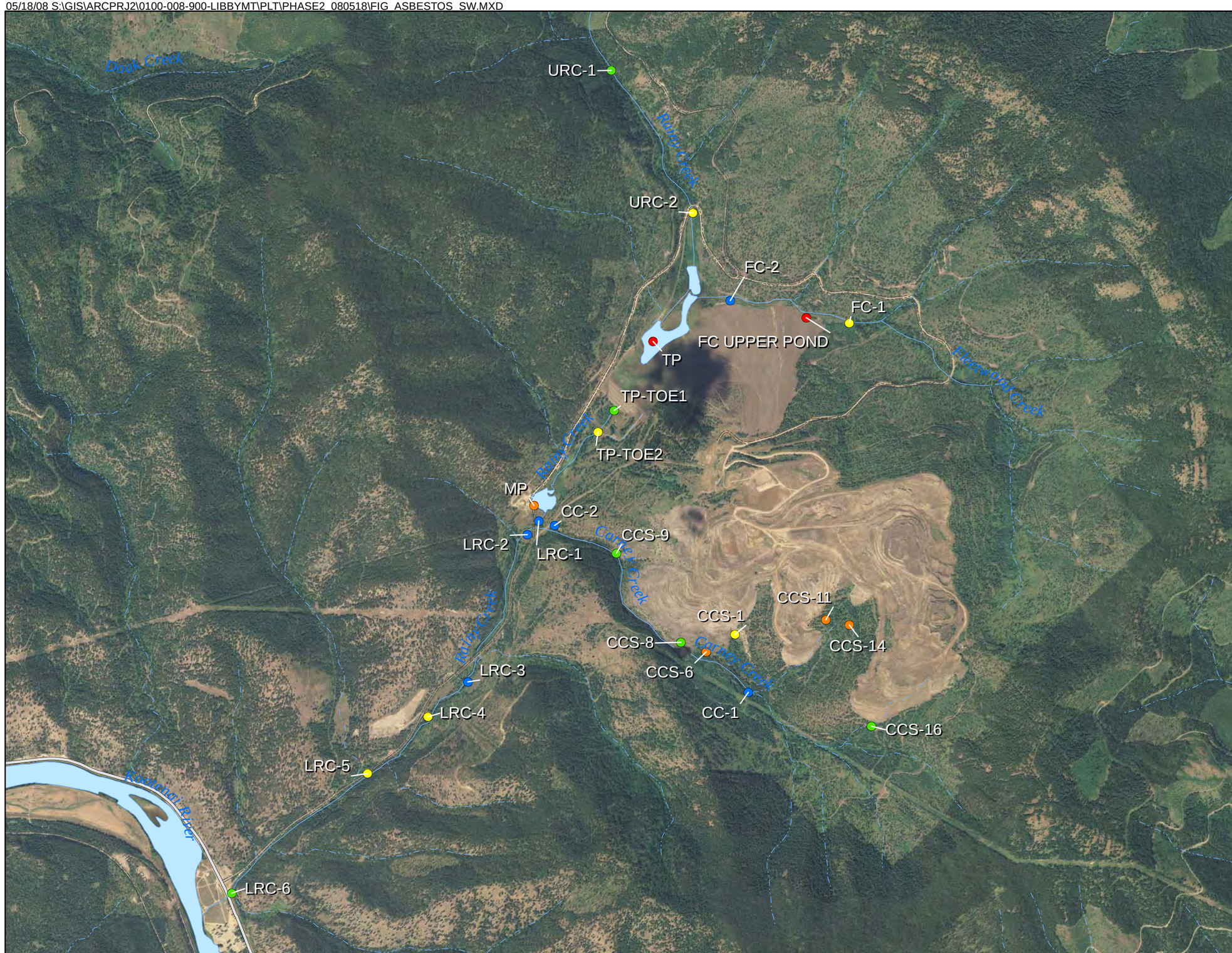
FIGURE 3-1

SAMPLING LOCATIONS IN RAINY CREEK WATERSHED

PROJECT: 0100-008-900	JAN. 29, 2008	
REV: 0	BY: VFS	CHECKED: ACK

NEWFIELDS

05/18/08 S:\GIS\ARCPRJ2\0100-008-900-LIBBYMT\PLT\PHASE2_080518\FIG_ASBESTOS_SW.MXD



Legend

- County Road
- Primary Road
- Open Water
- Perennial Stream
- Intermittent Stream

Asbestos in Surface Water (Total LA)

- Non Detect
- > ND - 1 MFL
- 1 - 10 MFL
- 10 - 100 MFL
- > 100 MFL

N

0 2,000 4,000

Feet

LIBBY MONTANA SUPERFUND SITE

OPERABLE UNIT 3

FIGURE 3-2

ASBESTOS LEVELS IN SURFACE WATER

PROJECT: 0100-008-900	MAY 18, 2008	
REV: 0	BY: VFS	CHECKED: KJT

NEWFIELDS

05/20/08 F:\0100-008-900-LIBBYMT\PLT\PHASE2_080518\FIG_ASBESTOS_SED.MXD

Legend

Asbestos Levels in Sediment (MFLA % Fine)

- ND
- TR
- < 1%
- 2 - 6%
- County Road
- Primary Road
- Open Water
- Perennial Stream
- Intermittent Stream

N

0 2,000 4,000

Feet

LIBBY MONTANA SUPERFUND SITE

OPERABLE UNIT 3

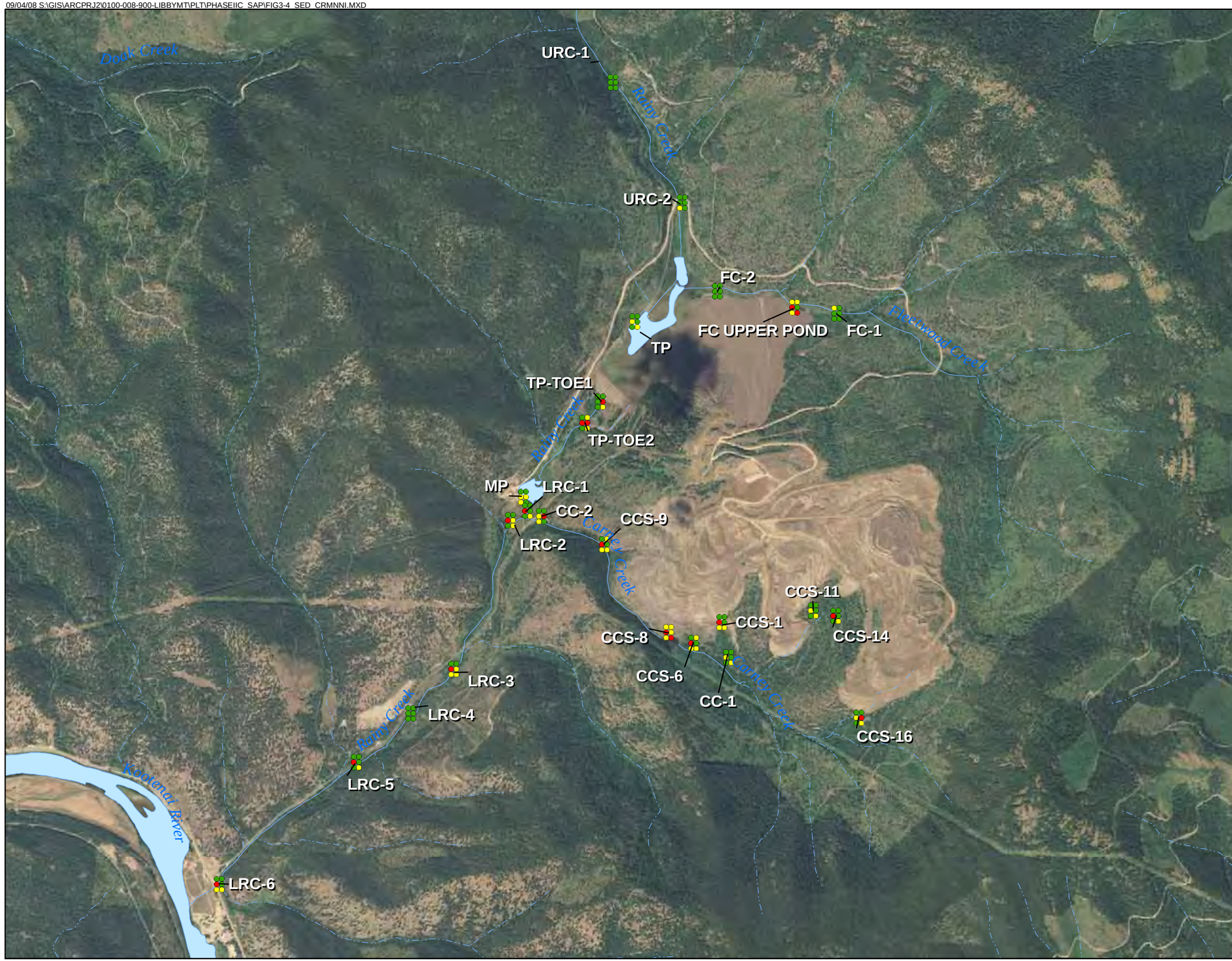
FIGURE 3-3

ASBESTOS LEVELS IN SEDIMENT

PROJECT: 0100-008-900	MAY 20, 2008	
REV: 0	BY: VFS	CHECKED: KJT

NEWFIELDS

09/04/08 S:\GIS\ARCPRJ2\0100-008-900-LIBBYMT\PLT\PHASEIIC_SAP\FIG3-4_SED_CRMNNI.MXD



Legend

Lead
- <36 mg/kg
- 37 - 128 mg/kg
- >129 mg/kg

Copper
- < 32 mg/kg
- 33 - 149 mg/kg
- >150 mg/kg

Aluminum
- < 25519 mg/kg
- 25520 - 59572 mg/kg
- >59573 mg/kg

Chromium
- < 43 mg/kg
- 43 - 111 mg/kg
- > 111 mg/kg

Manganese
- < 631 mg/kg
- 631 - 1,184 mg/kg
- > 1,184 mg/kg

Nickel
- < 23 mg/kg
- 23 - 49 mg/kg
- > 49 mg/kg

For All Locations
- < TEC
- > TEC and < PEC
- > PEC

Note: TEC and PEC terms are described in the Problem Formulation Document (USEPA 2008c).

Display Order

Al Pb
Cr Mn
Cu Ni

N

0 0.25 0.5
Miles

LIBBY MONTANA SUPERFUND SITE
OPERABLE UNIT 3

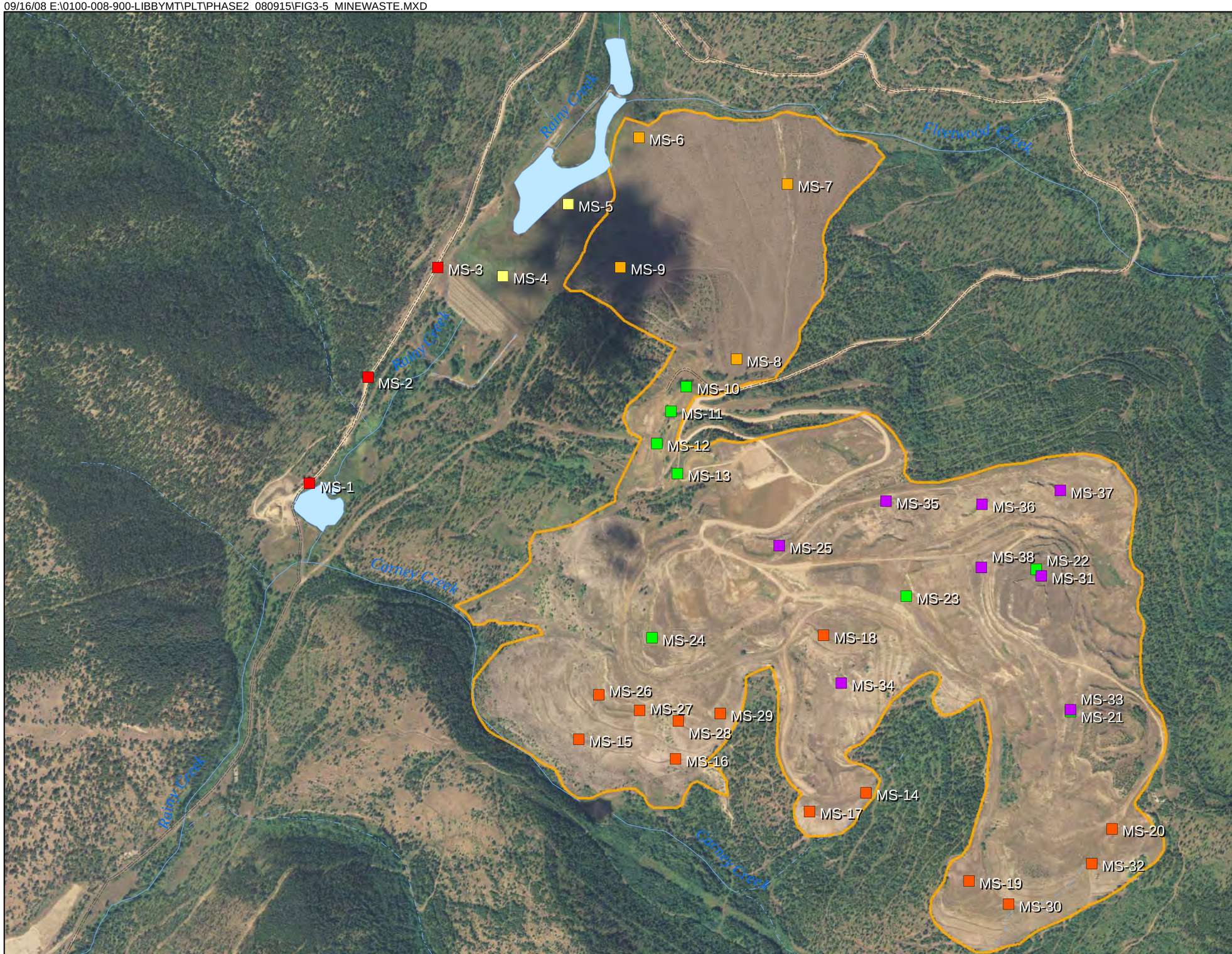
FIGURE 3-4

CHROMIUM, MANGANESE, AND NICKEL CONCENTRATIONS IN SEDIMENTS

PROJECT::	SEP 04, 2008	
REV:	BY:	CHECKED:

NEWFIELDS

09/16/08 E:\0100-008-900-LIBBYMT\PLT\PHASE2_080915\FIG3-5_MINEWASTE.MXD



Legend

- County Road
- Primary Road
- Open Water
- Perennial Stream
- Intermittent Stream
- Mined Area

MineWaste Sampling Location

- Waste Rock
- Cover Material
- Outcrop
- Coarse Tailings
- Tailings Impoundment
- Road

N

0 1,000 2,000

Feet

LIBBY MONTANA SUPERFUND SITE

OPERABLE UNIT 3

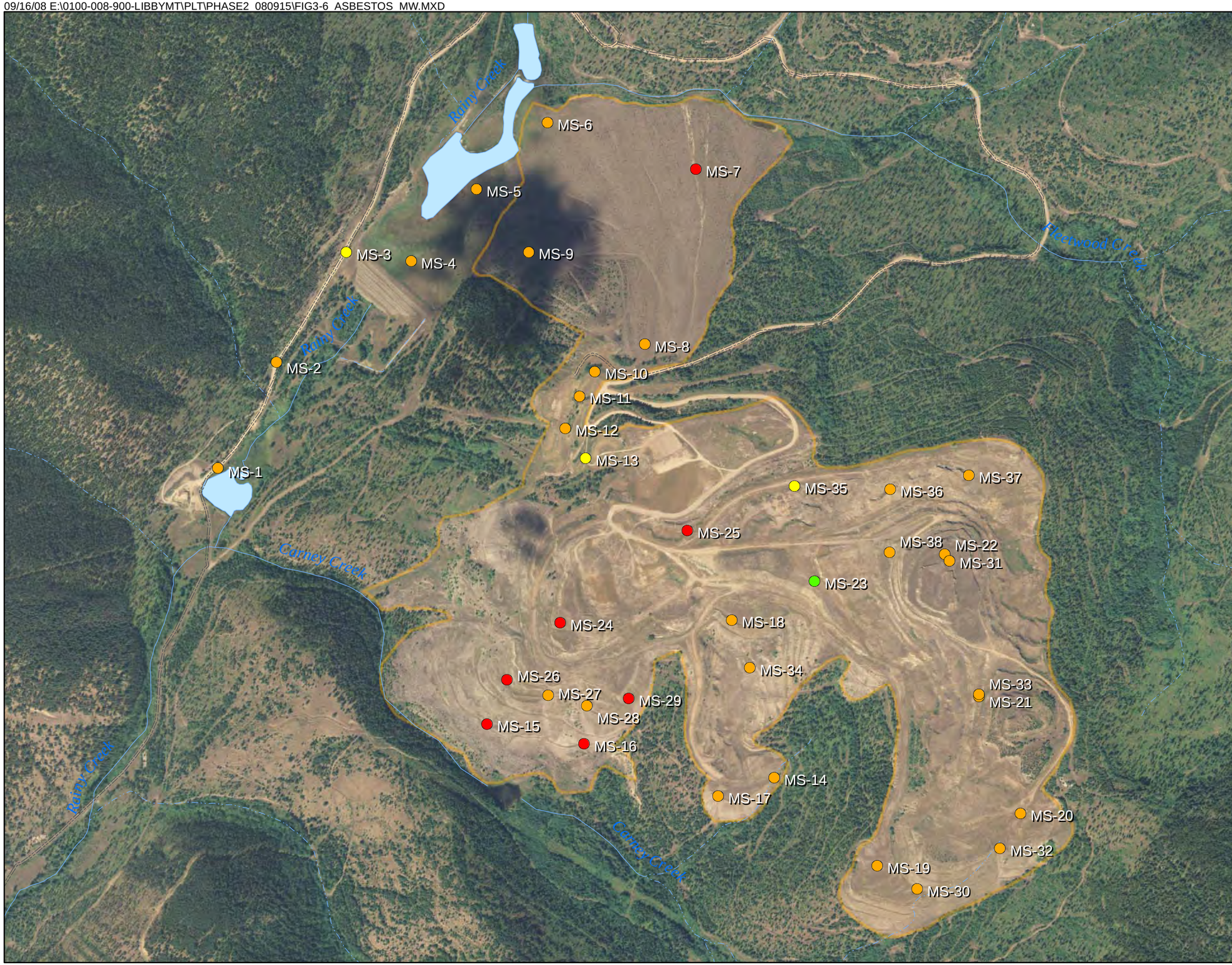
FIGURE 3-5

MINE WASTE SAMPLING LOCATIONS

PROJECT: 0100-008-900	SEP 16, 2008	
REV: 0	BY: VFS	CHECKED: ACK

NEWFIELDS

09/16/08 E:\0100-008-900-LIBBYMT\PLT\PHASE2_080915\FIG3-6_ASBESTOS_MW.MXD



Legend

Asbestos in Mine Waste (MFLA % Fine)

- ND
- TR
- < 1%
- 2 - 8 %
- Open Water
- Perennial Stream
- Intermittent Stream

N

0 1,000 2,000

Feet

LIBBY MONTANA SUPERFUND SITE

OPERABLE UNIT 3

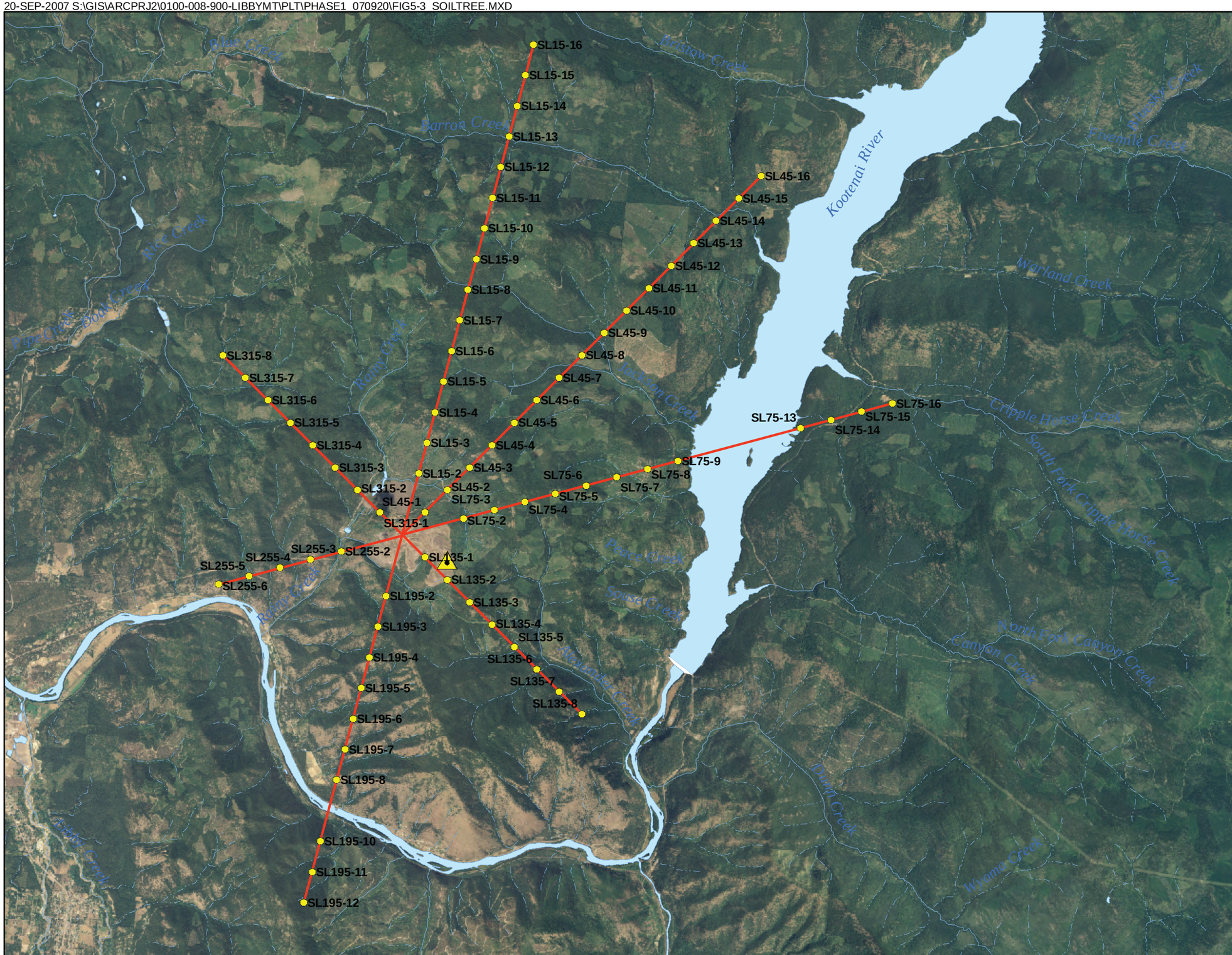
FIGURE 3-6

ASBESTOS LEVELS IN MINE WASTE

PROJECT: 0100-008-900	SEP 16, 2008	
REV: 0	BY: VFS	CHK: ACK

NEWFIELDS

20-SEP-2007 S:\GIS\ARCPRJ2\0100-008-900-LIBBYMT\PLT\PHASE1_070920\FIG5-3_SOILTREE.MXD



Legend

- Soil/Tree Bark Sampling Location
- Open Water
- Perennial Stream
- Intermittent Stream

N

0 1.5 3

Miles

LIBBY MONTANA SUPERFUND SITE

OPERABLE UNIT 3

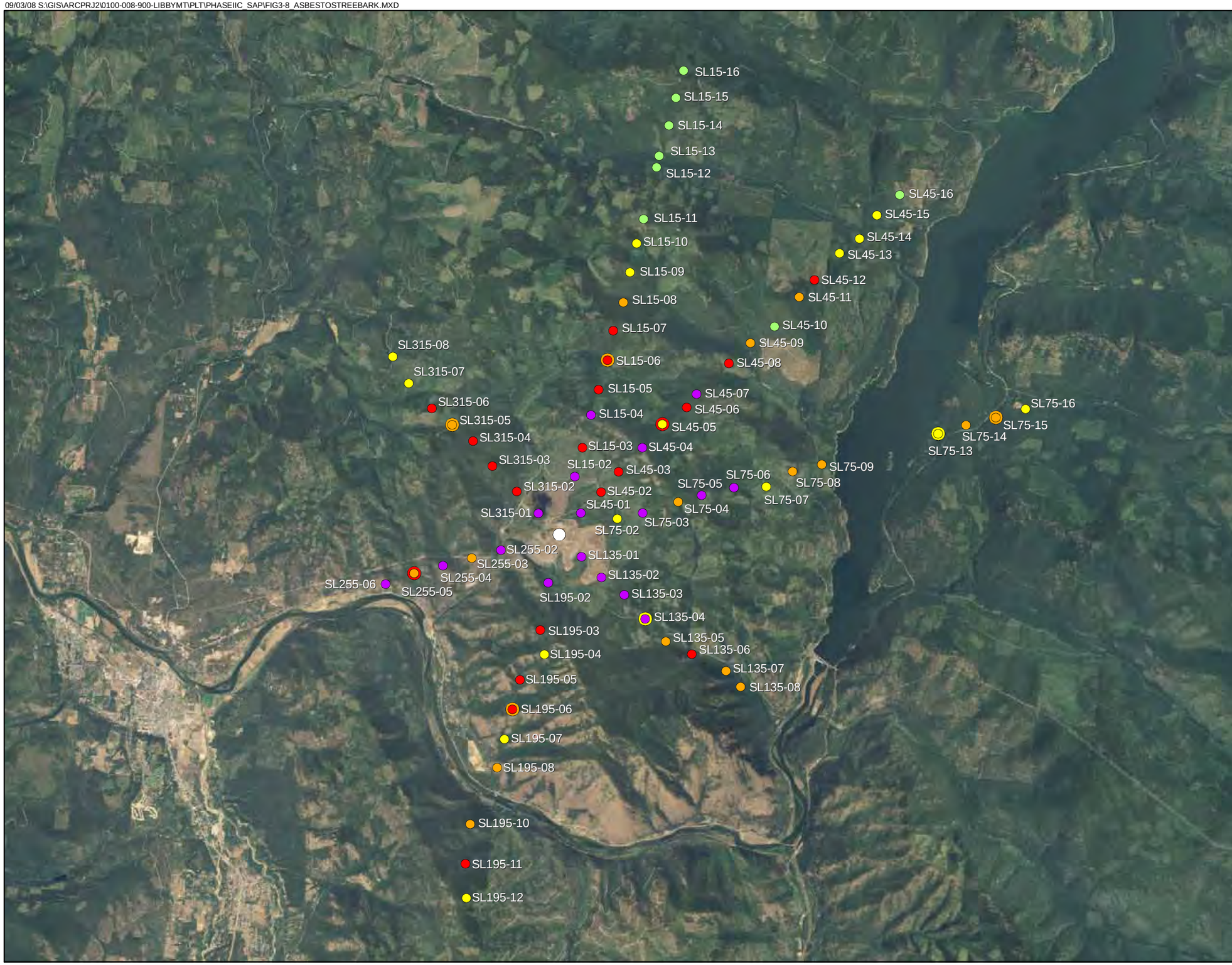
FIGURE 3-7

SOIL / TREE BARK SAMPLING LOCATIONS

PROJECT: 0100-008-900	DATE: AUG 28, 2007	
REV: 0	BY: CRL	CHECKED: ACK

NEWFIELDS

09/03/08 S:\GIS\ARCPRJ2\0100-008-900-LIBBYMT\PLT\PHASEIIC_SAP\FIG3-8_ASBESTOSTREEBARK.MXD



Legend

Asbestos Levels in Tree Bark (TEM)

- ND
- < 0.1 Ms/cm2
- 0.1 - 0.5 Ms/cm2
- 0.5 - 2.5 Ms/cm2
- > 2.5 Ms/cm2

Duplicates of Asbestos in Tree Bark (TEM)

- ND
- < 0.1 Ms/cm2
- 0.1 - 0.5 Ms/cm2
- 0.5 - 2.5 Ms/cm2
- > 2.5 Ms/cm2
- Origin of Transects

N

0 2 4

Miles

LIBBY MONTANA SUPERFUND SITE

OPERABLE UNIT 3

FIGURE 3-8

ASBESTOS LEVELS IN TREE BARK

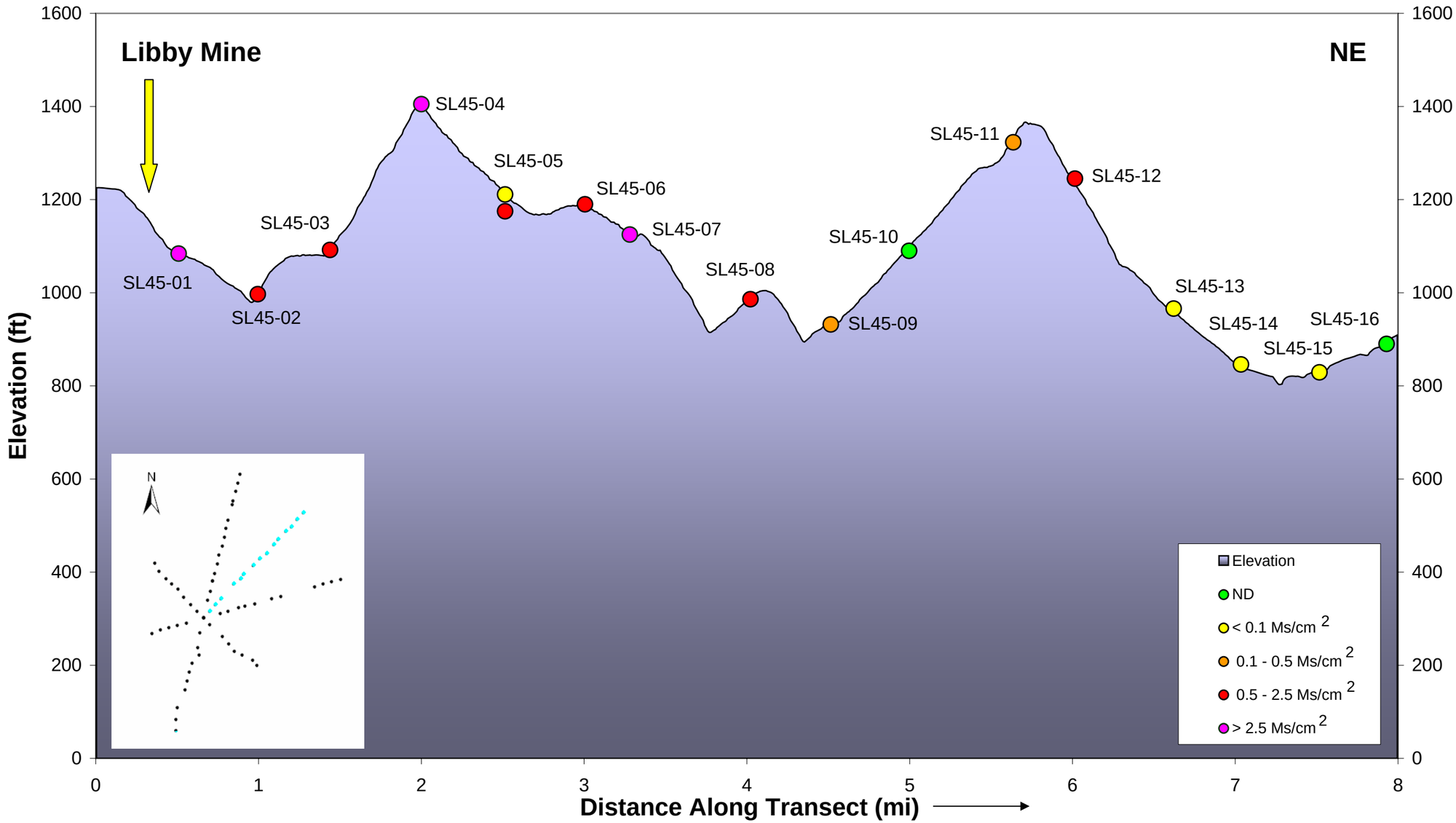
PROJECT: 0100-008-900	SEP 03, 2008	
REV: 0	BY: VFS	CHECKED: ACK

NEWFIELDS

Libby Montana Superfund Site - OU3
Project 0100-008-900

Figure 3-9

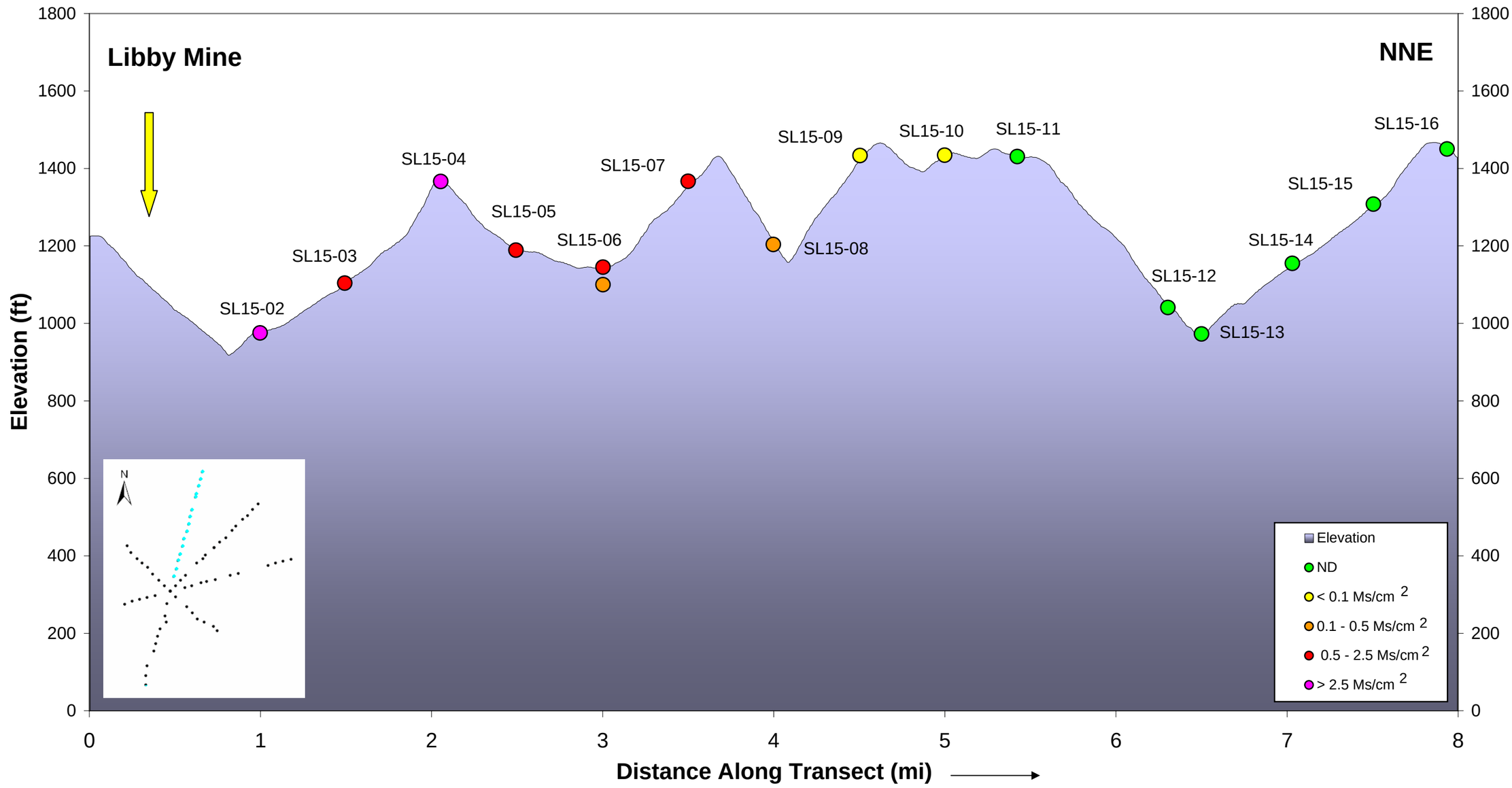
Asbestos Levels in Tree Bark Along Transect 45° to NE



Libby Montana Superfund Site - OU3
Project 0100-008-900

Figure 3-10

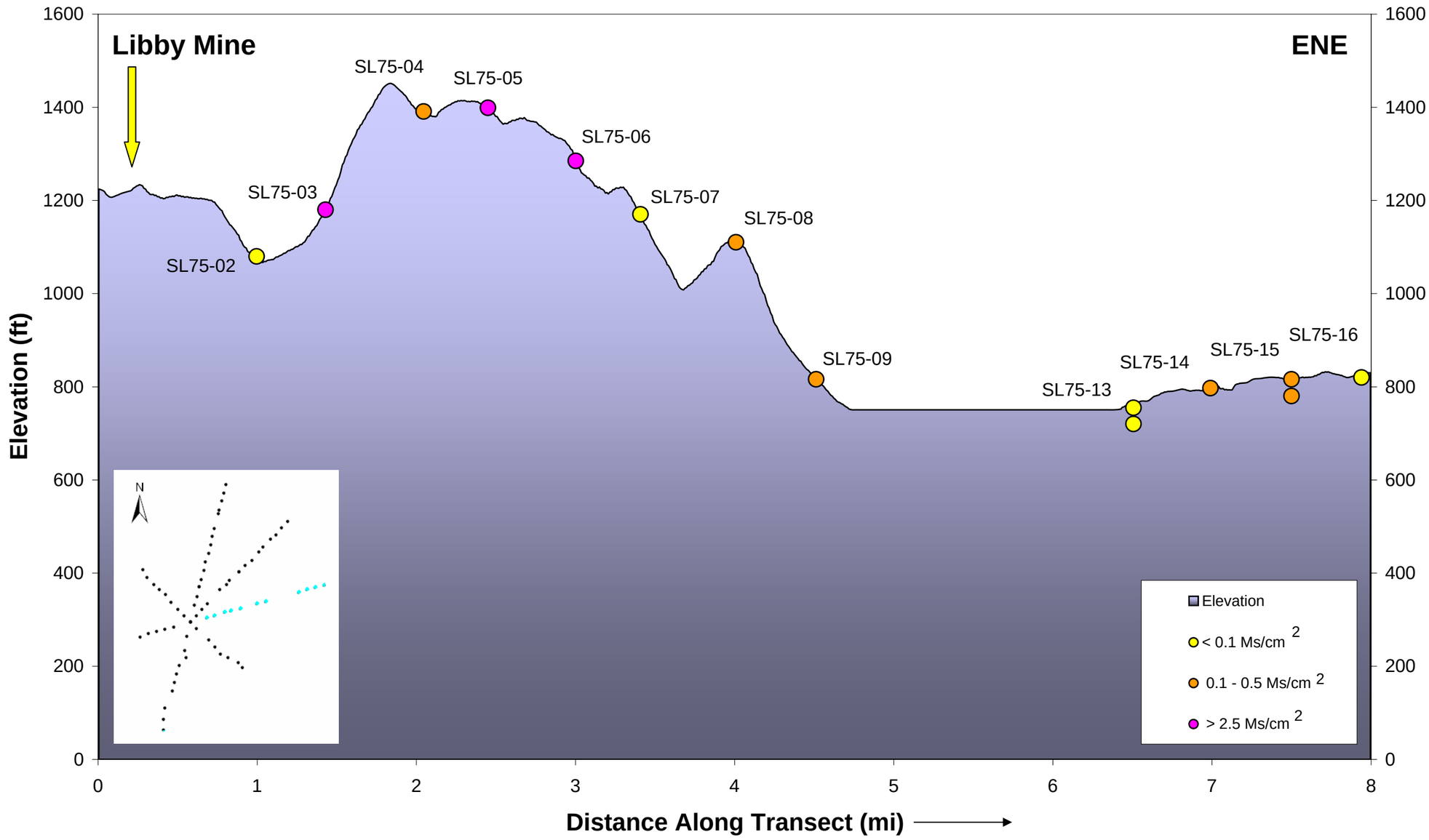
Asbestos Levels in Tree Bark Along Transect 15° to NNE



Libby Montana Superfund Site - OU3
Project 0100-008-900

Figure 3-11

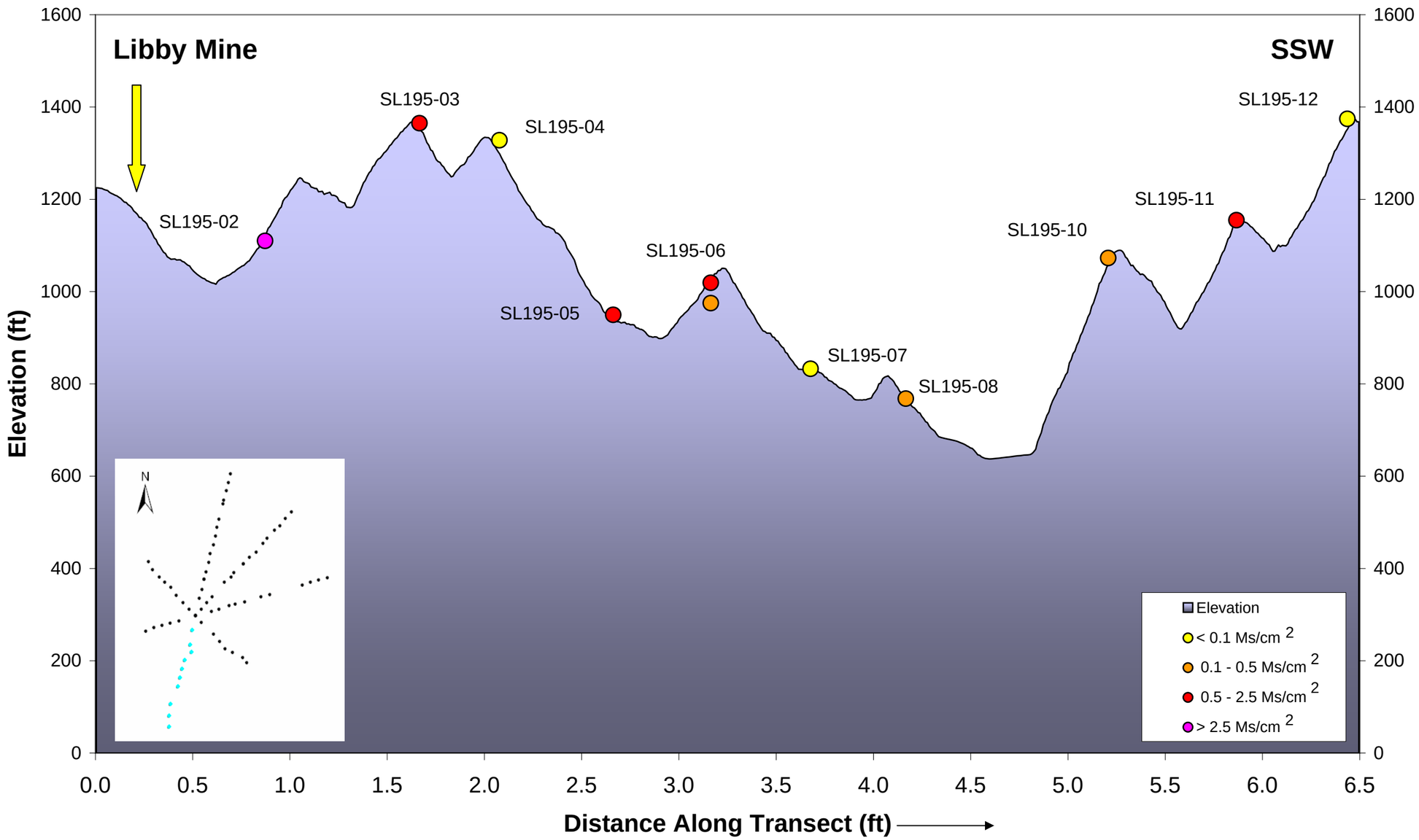
Asbestos Levels in Tree Bark Along 75° Transect to ENE



Libby Montana Superfund Site - OU3
Project 0100-008-900

Figure 3-12

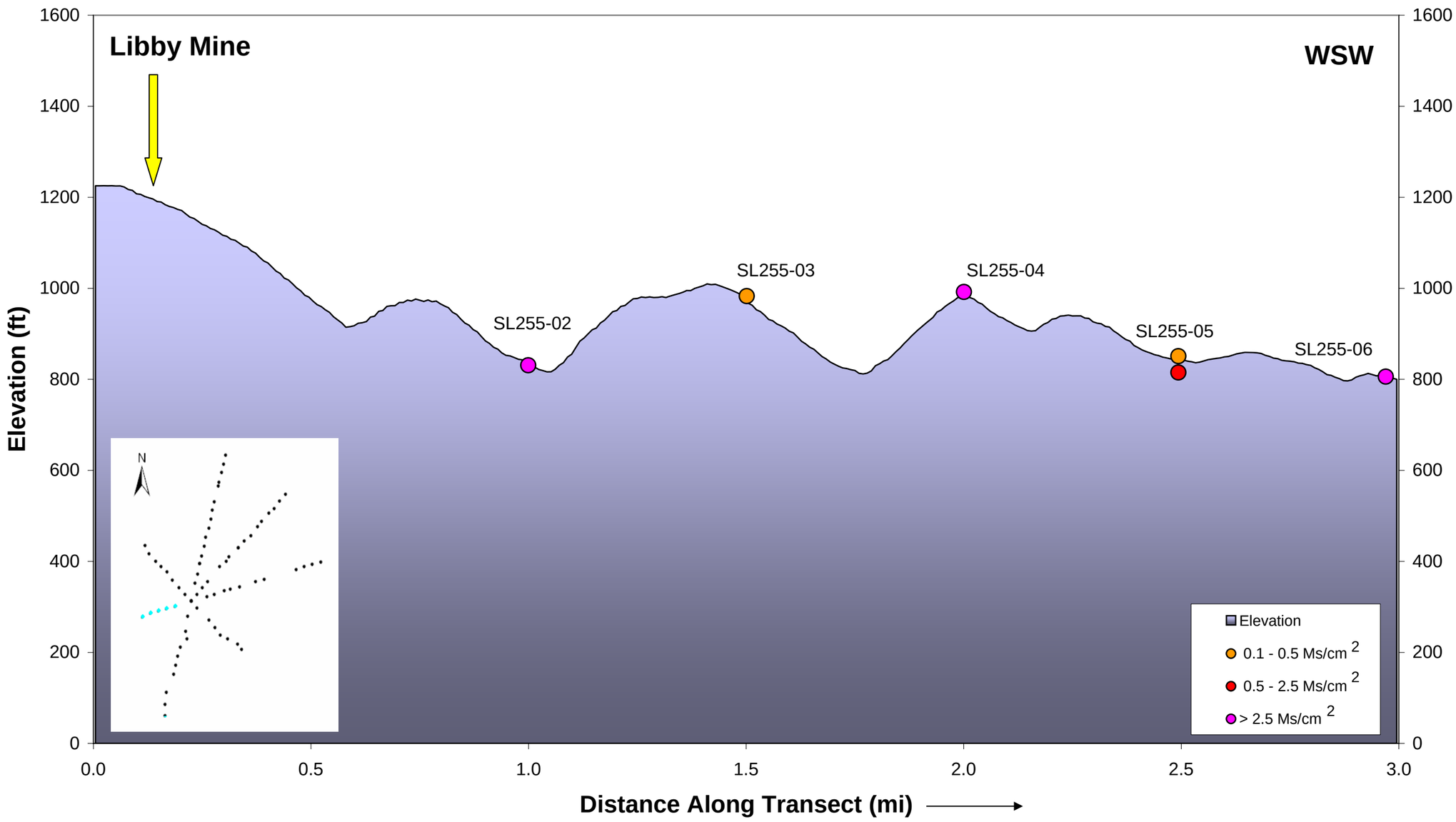
Asbestos Levels in Tree Bark Along Transect 195° to the SSW



Libby Montana Superfund Site - OU3
Project 0100-008-900

Figure 3-13

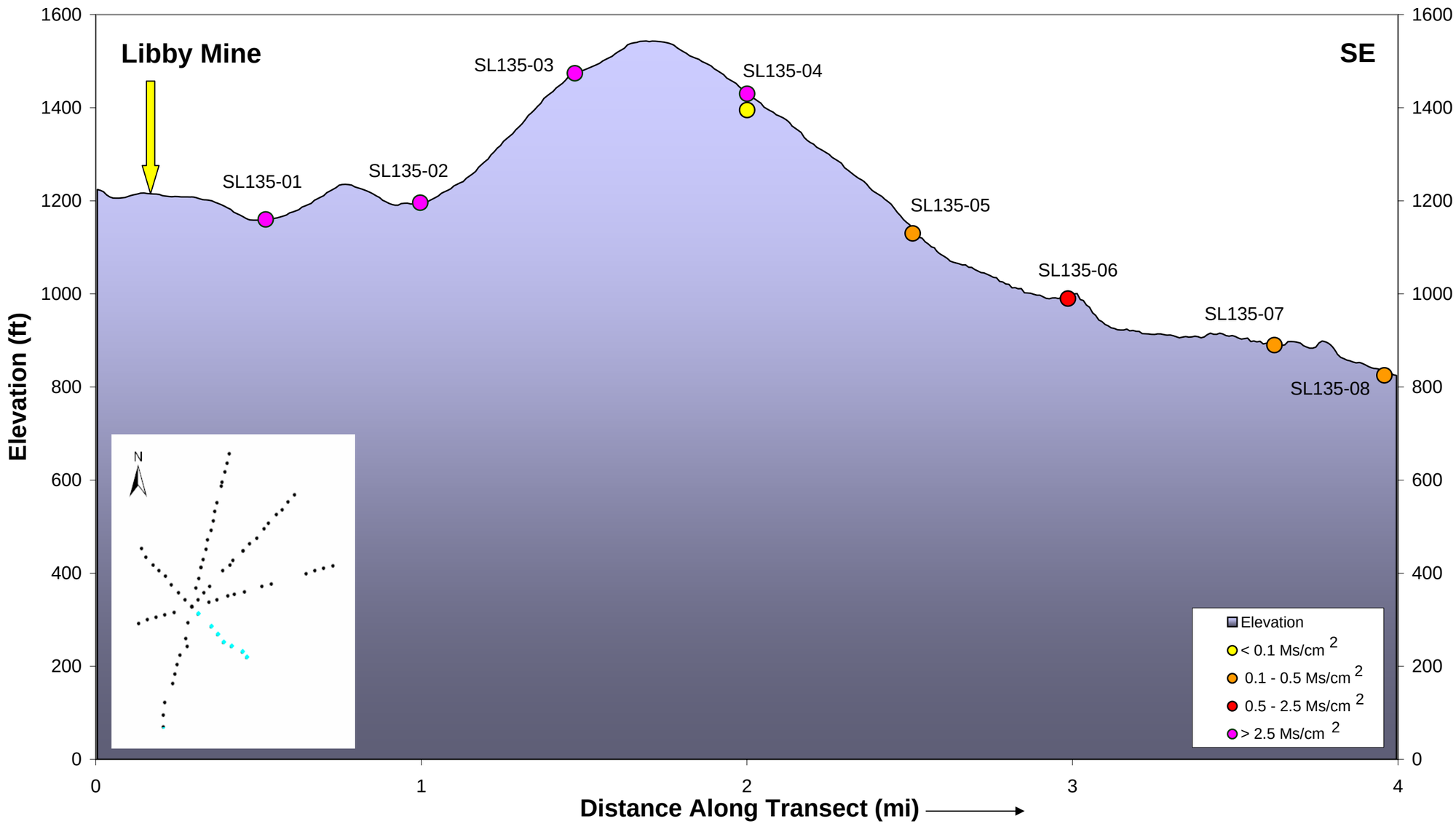
Asbestos Levels in Tree Bark Along Transect 255° to WSW



Libby Montana Superfund Site - OU3
Project 0100-008-900

Figure 3-14

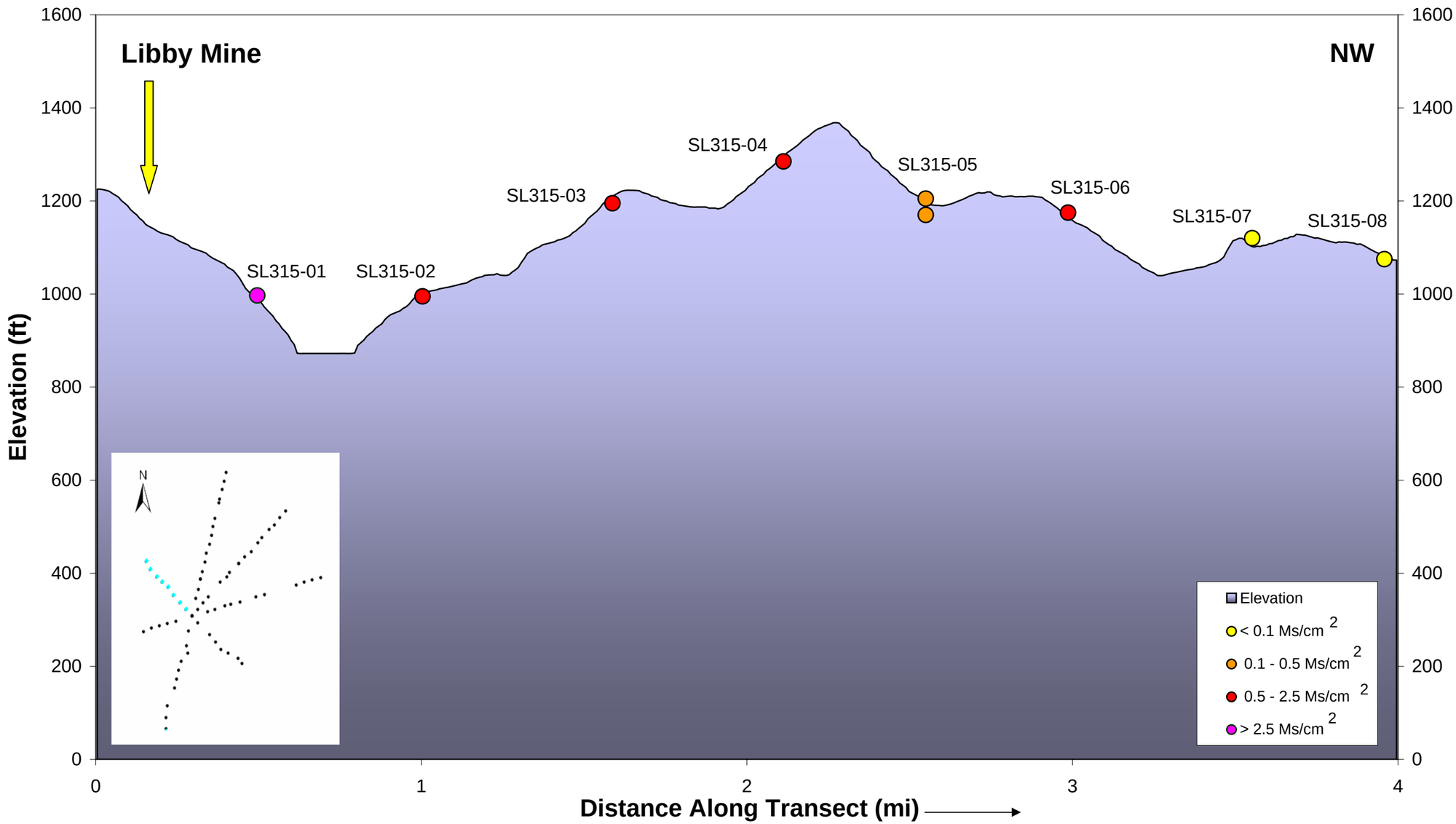
Asbestos Levels in Tree Bark Along Transect 135° to SE



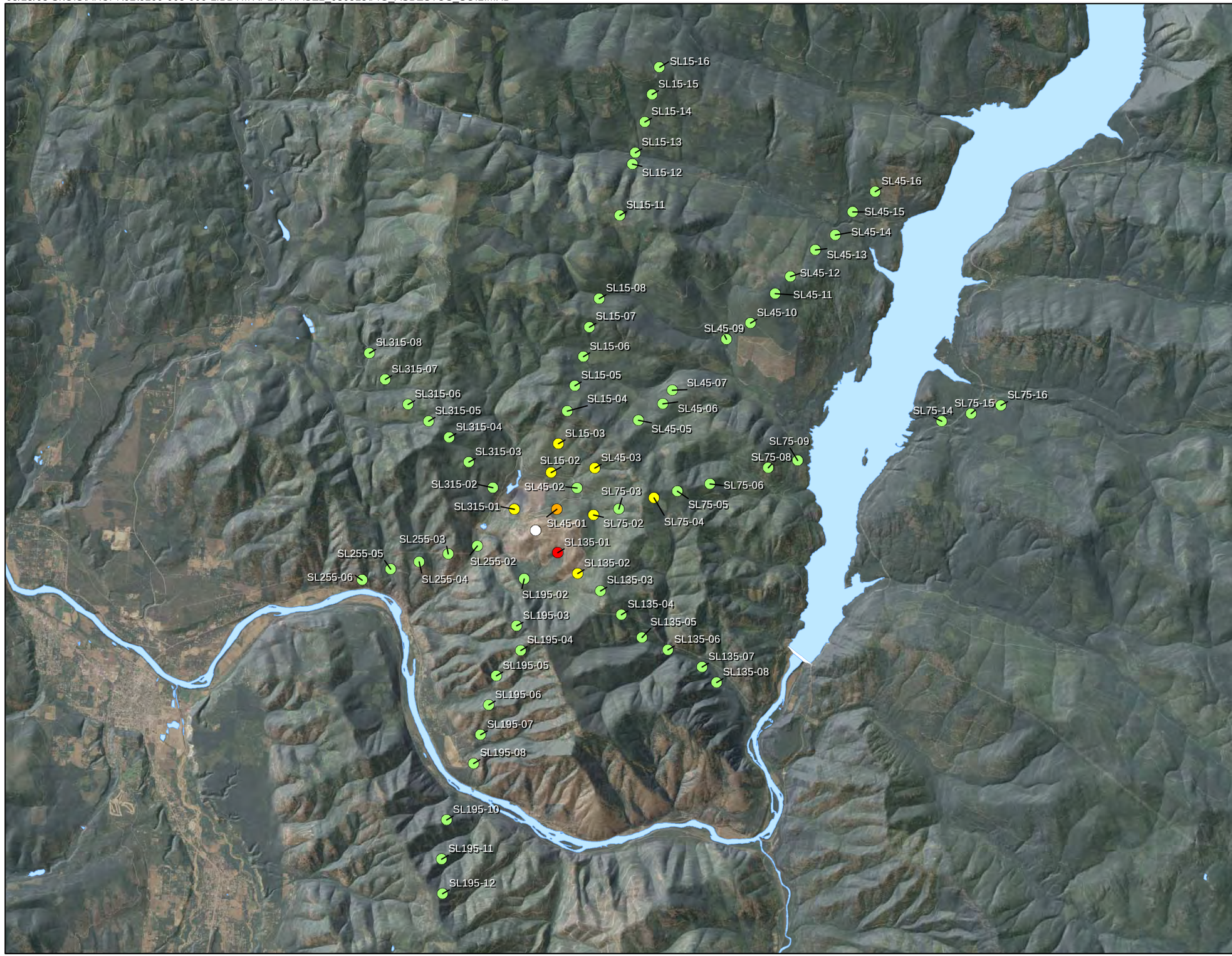
Libby Montana Superfund Site - OU3
Project 0100-008-900

Figure 3-15

Asbestos Levels in Tree Bark Along Transect 315° to NW



05/18/08 S:\GIS\ARCPRJ2\0100-008-900-LIBBYMT\PLT\PHASE2_080518\FIG_ASBESTOS_SOIL.MXD



Legend

- Open Water
- Origin of Transects

Asbestos Levels in Soil (PLM-VE)

- ND
- TR
- <1%
- 2 - 6%

N

0 1 2

Miles

LIBBY MONTANA SUPERFUND SITE

OPERABLE UNIT 3

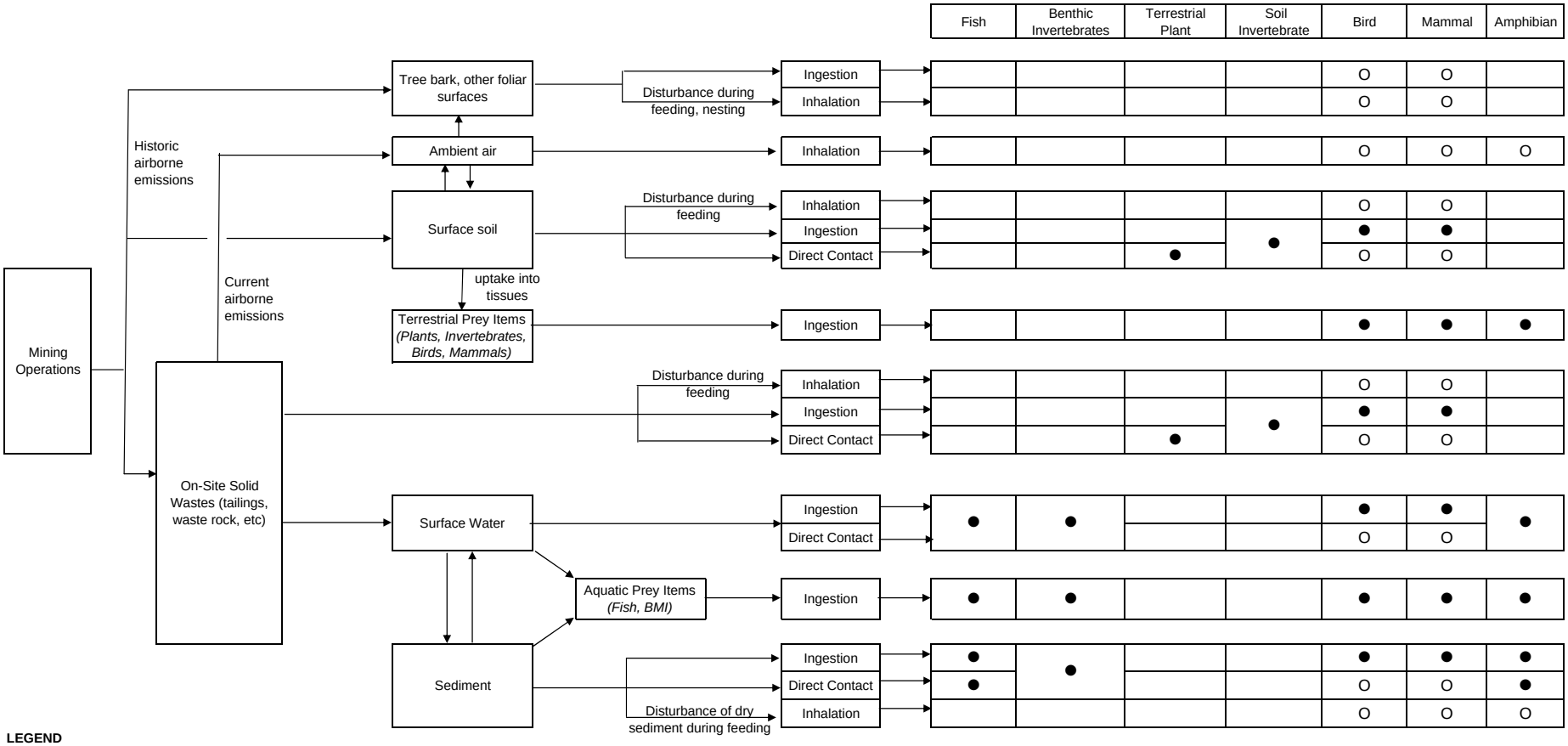
FIGURE 3-16

ASBESTOS LEVELS IN FOREST SOILS

PROJECT: 0100-008-900	MAY 18, 2008	
REV: 0	BY: VFS	CHK: ACK

NEWFIELDS

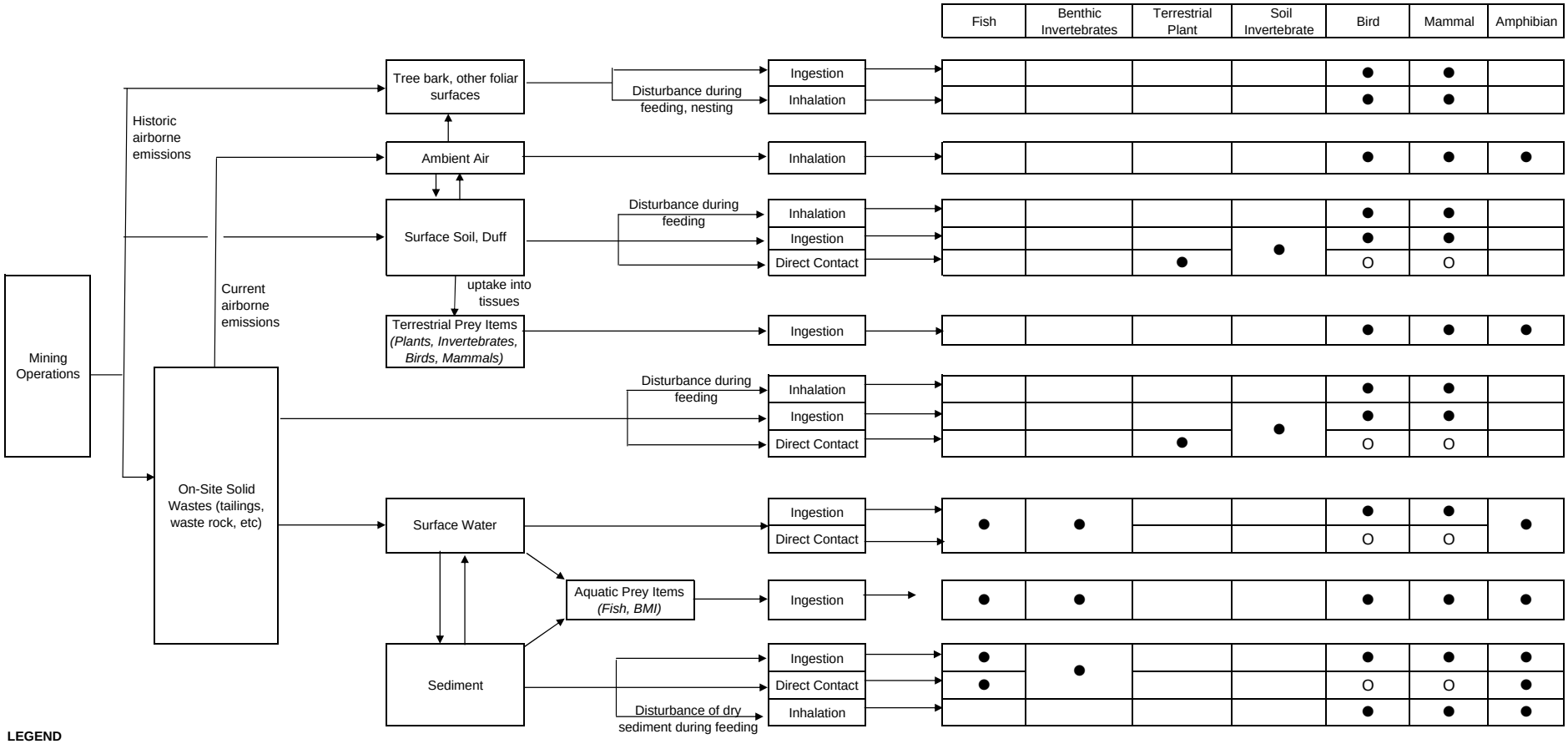
Figure 4-1. Conceptual Site Model for Exposure of Ecological Receptors to Non-Asbestos Contaminanats at OU3



LEGEND

●	Pathway is believed to be complete, and which may provide an important contribution to the total risk to the receptor.
O	Pathway is believed to be complete but is unlikely to be a major contributor to the total risk to the receptor (in comparison to one or more other pathways that are evaluated).
	Pathway is incomplete or believed to be negligible

Figure 4-2. Conceptual Site Model for Exposure of Ecological Receptors to Asbestos at OU3



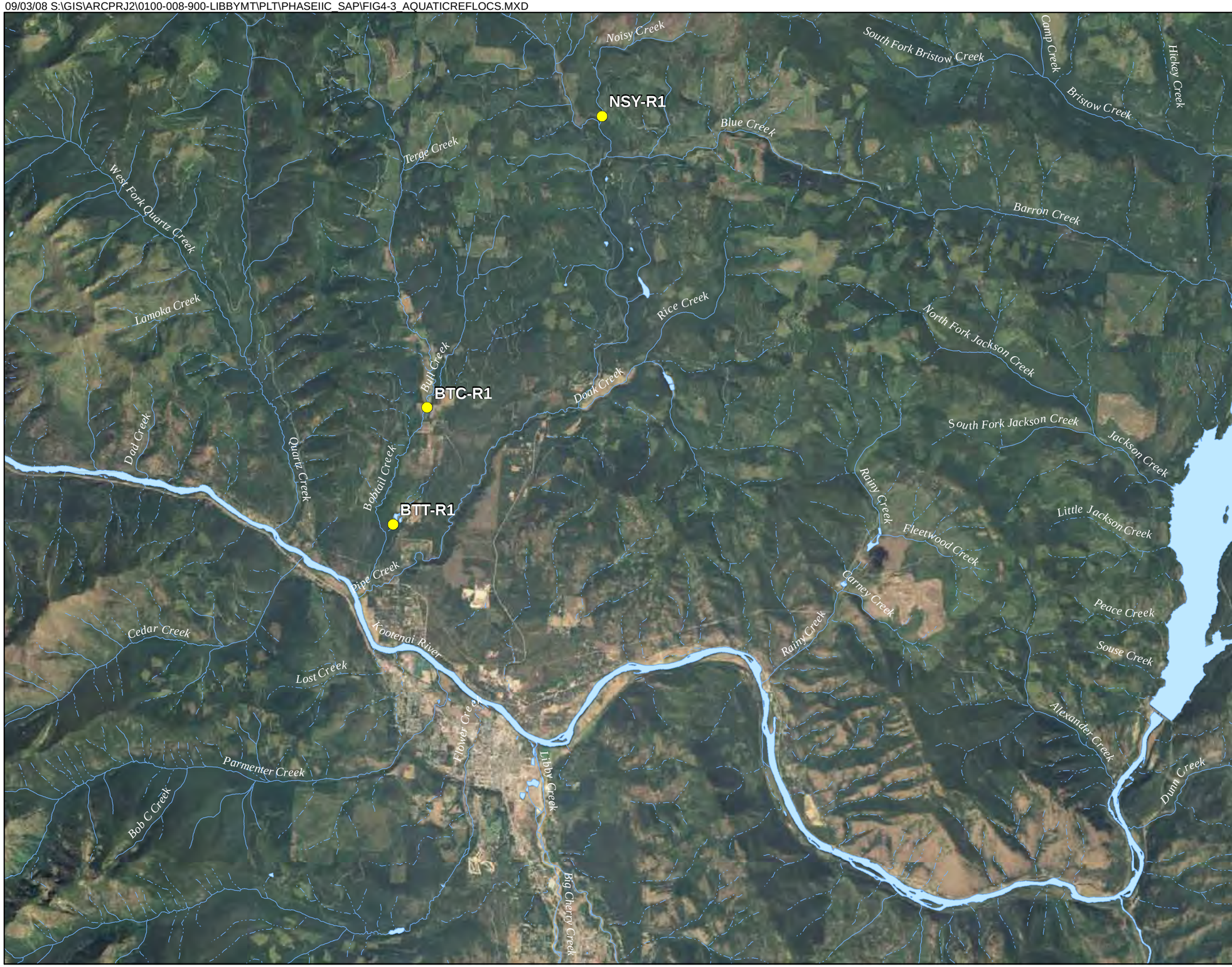
LEGEND

● Pathway is believed to be complete

O Pathway is believed to be complete but is unlikely to be a major contributor to the total risk to the receptor (in comparison to one or more other pathways).

Pathway is incomplete or believed to be negligible

09/03/08 S:\GIS\ARCPRJ2\0100-008-900-LIBBYMT\PLT\PHASEIIC_SAP\FIG4-3_AQUATICREFLOCS.MXD



Legend

- Aquatic Reference Location

N

0 2 4

Miles

LIBBY MONTANA SUPERFUND SITE

OPERABLE UNIT 3

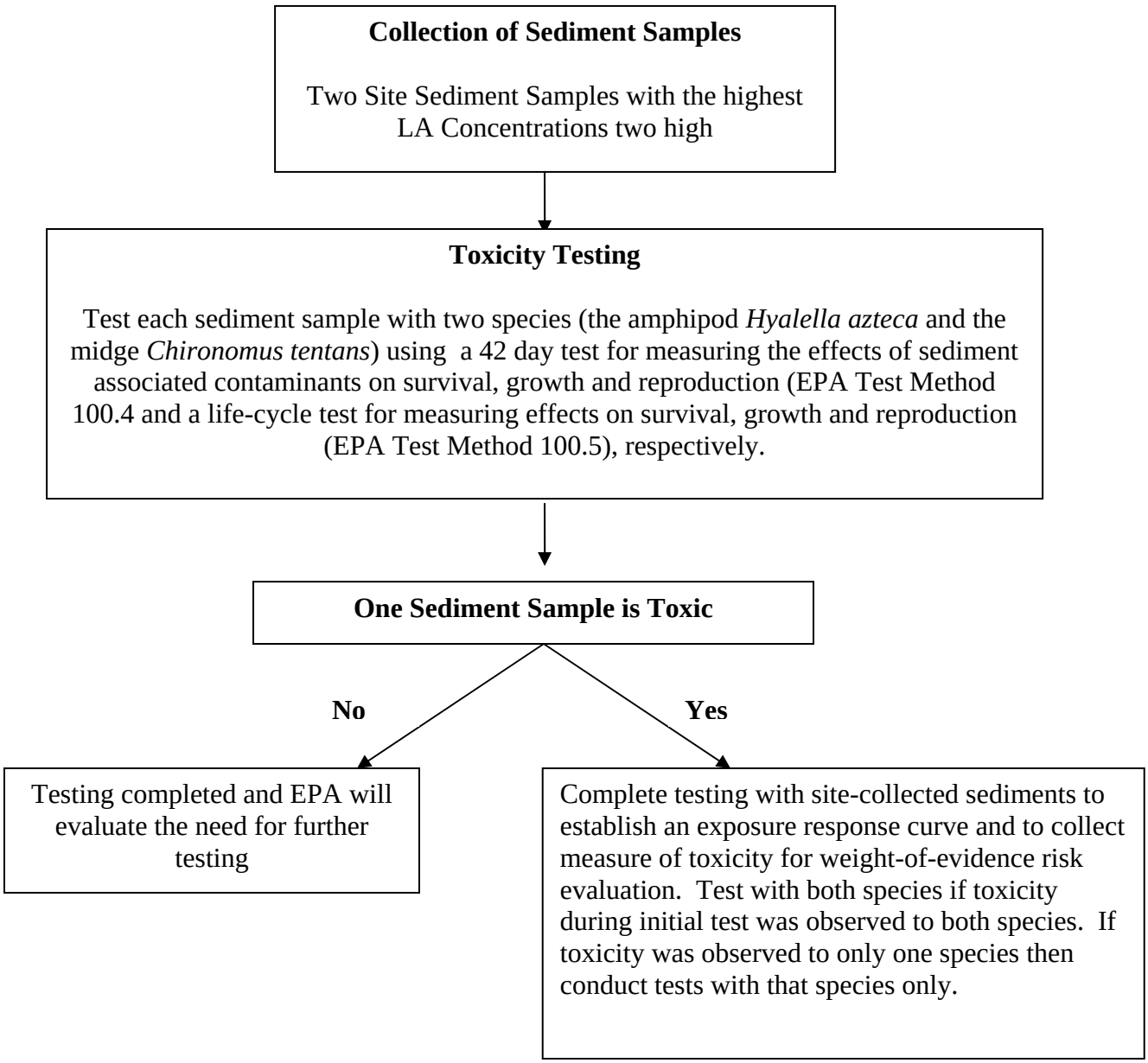
FIGURE 4-3

AQUATIC REFERENCE LOCATIONS

PROJECT: 0100-008-900	SEP 03, 2008	
REV: 0	BY: VFS	CHECKED: ACK

NEWFIELDS

Figure 5-1
Site-Specific Toxicity Testing of Risks to Benthic Invertebrates from Asbestos in Sediment
Phase IIC SAP



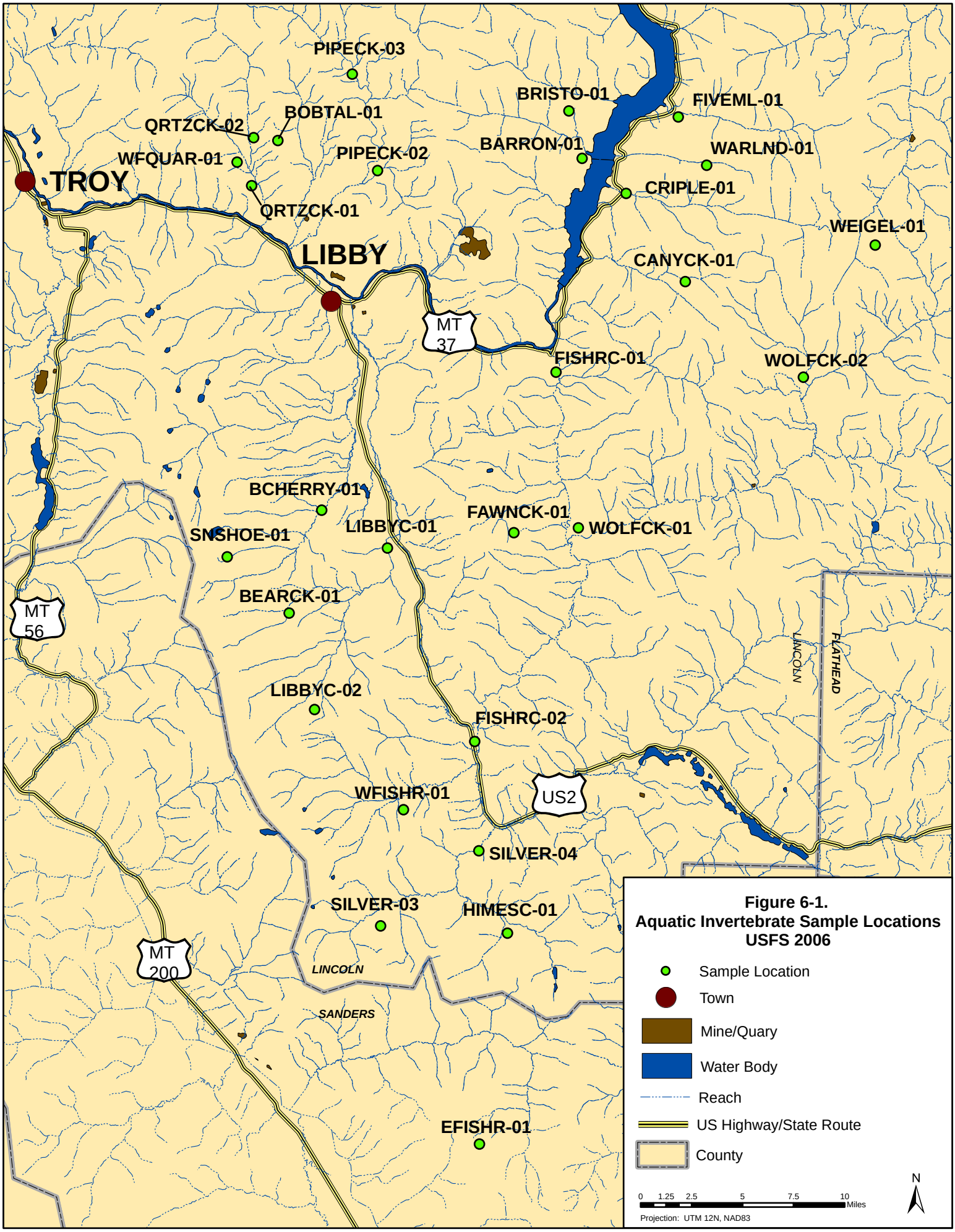


Figure 6-1.
Aquatic Invertebrate Sample Locations
USFS 2006