# SECTION 9

# DETAILED FINDINGS REPORT – HUBBELL PROCESSING AREA FIGURES

Prepared for:
**Michigan Department of Environmental Quality**

Prepared By:
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**Figure 9-1a**
Sampling Location Map
Hubbell Processing Area - Coal Dock
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\2016_CHLL_SI_Report\Sec09-HubProcess\Fig09_1a_Sampling_Locations_CoalDock_v20160219.mxd 11:00:38 AM 2/19/2016 BROWNK

**Sampling Location Type**

- Bulk Asbestos
- Residual Process Material
- Waste Pile
- Soil
- Groundwater
- Surface Water
- Sediment
- Conceptual Site and Geographic Area Boundaries

N

0 150 Ft

Coordinate System: MIGeoRef(m)

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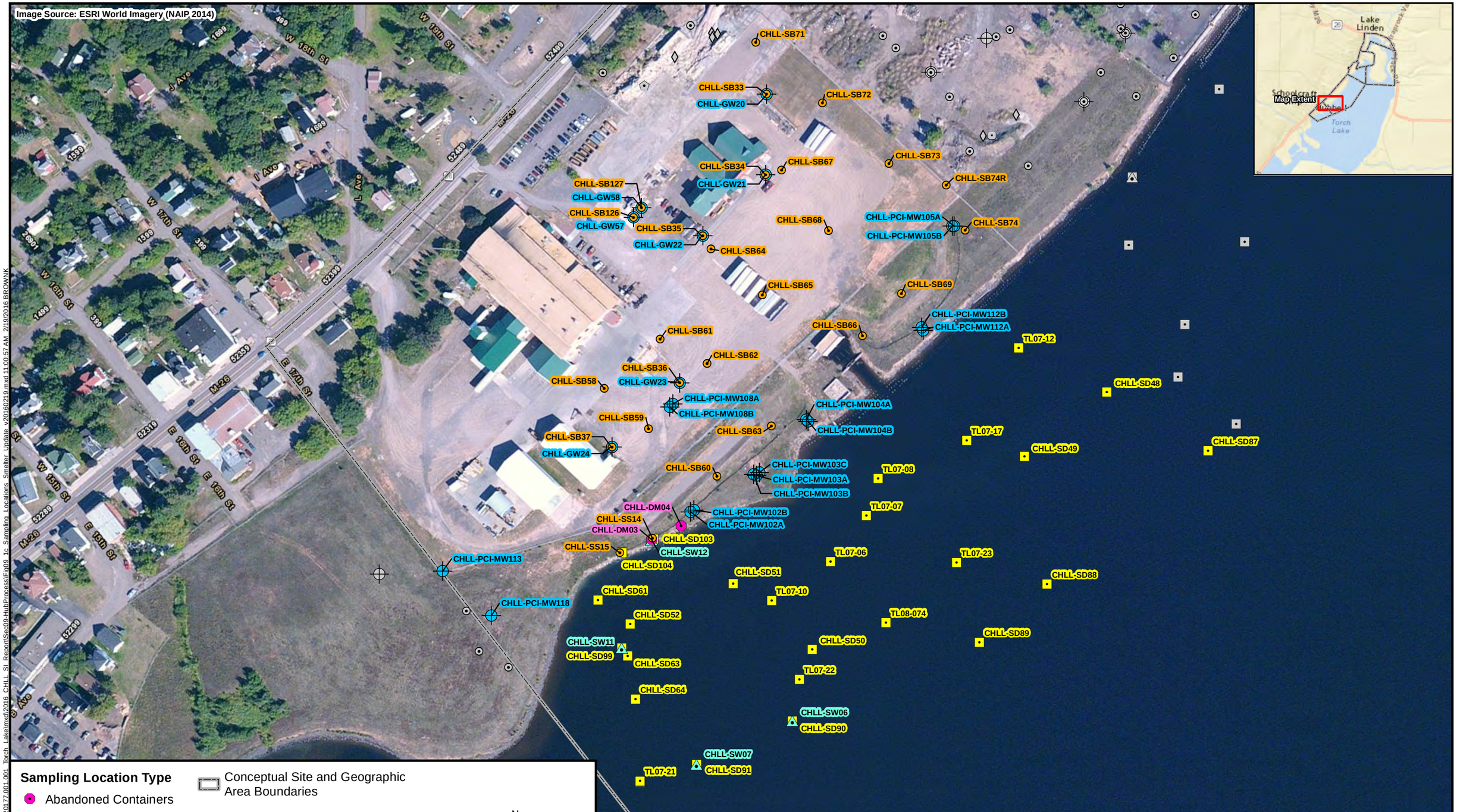
**Figure 9-1b**

Sampling Location Map
Hubbell Processing Area - Mineral Building
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\2016_CHLL_SI_Report\Sec09-HubProcess\Fig09_1b_Sampling_Locations_MineralBuilding_v20160219.mxd 11:00:43 AM 2/19/2016 BROWNK




**Sampling Location Type**

- Abandoned Containers
- Soil
- Groundwater
- Surface Water
- Sediment

Conceptual Site and Geographic Area Boundaries

N

0 175 Ft

Coordinate System: MIGeoRef(m)

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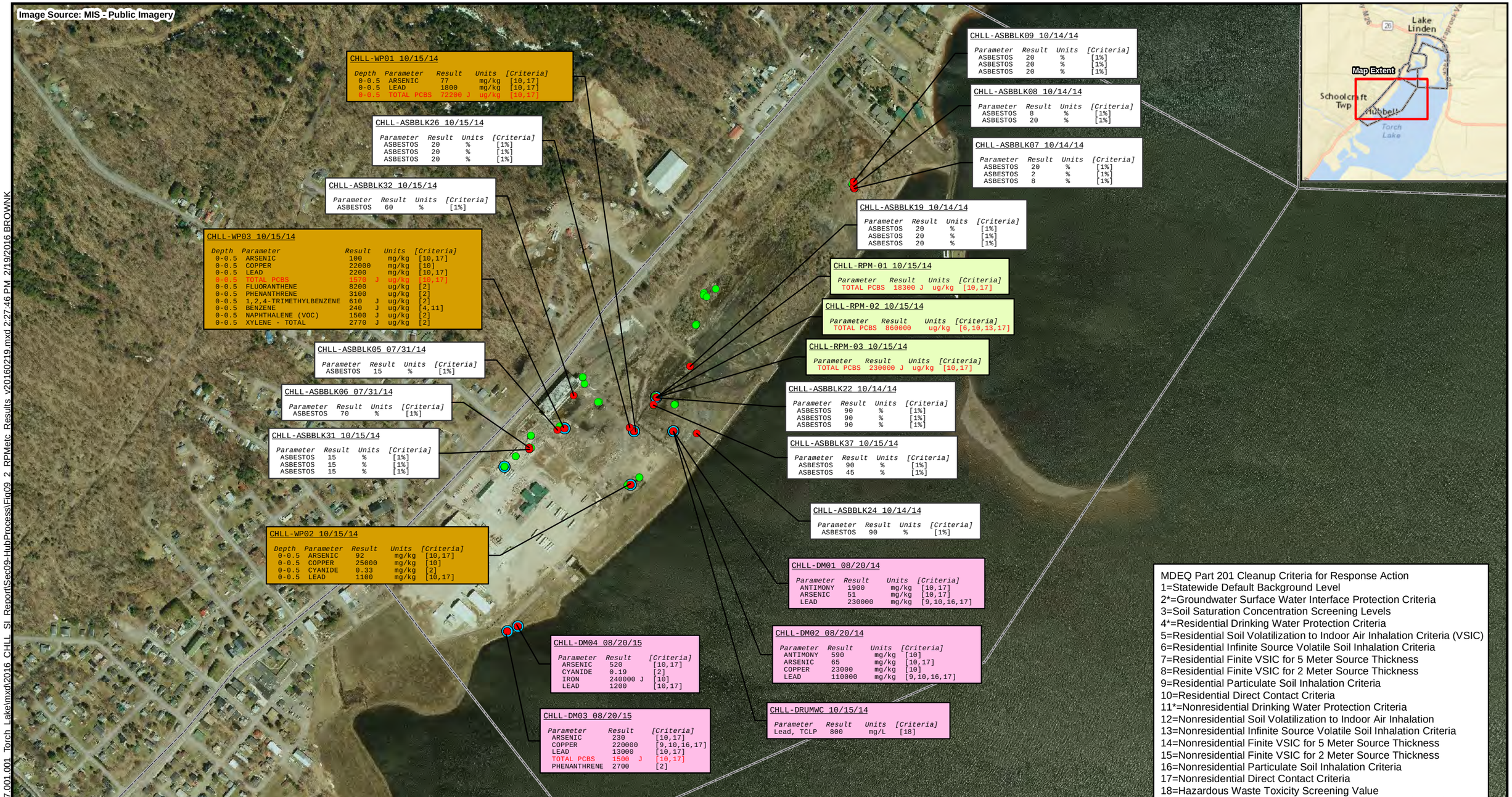
**Figure 9-1c**

Sampling Location Map
Hubbell Processing Area - Smelter
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\2016_CHLL_SI_Report\Sec09-HubProcess\Fig09_1c_Sampling_Locations_Smelter_Update_v20160219.mxd 11:00:57 AM 2/19/2016 BROWNK




Sampling locations with at least one exceedance

Sampling locations with no exceedances

Locations are included within a different geographical area boundary

**Locations Analyzed for PCBs**

No Detections

At Least One Detection

Conceptual Site and Geographic Area Boundaries

Notes:
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

N

0 500 Ft

Coordinate System: MIGeoRef(m)

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**Figure 9-2**
Sample Analytical Result Map
Building Materials, Containers, and Wastes
Hubbell Processing Area
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\2016_CHLL_SI_Report\Sec09-HubProcess\Fig09_2_RPMetc_Results_v20160219.mxd 2:27:46 PM 2/19/2016 BROWNK

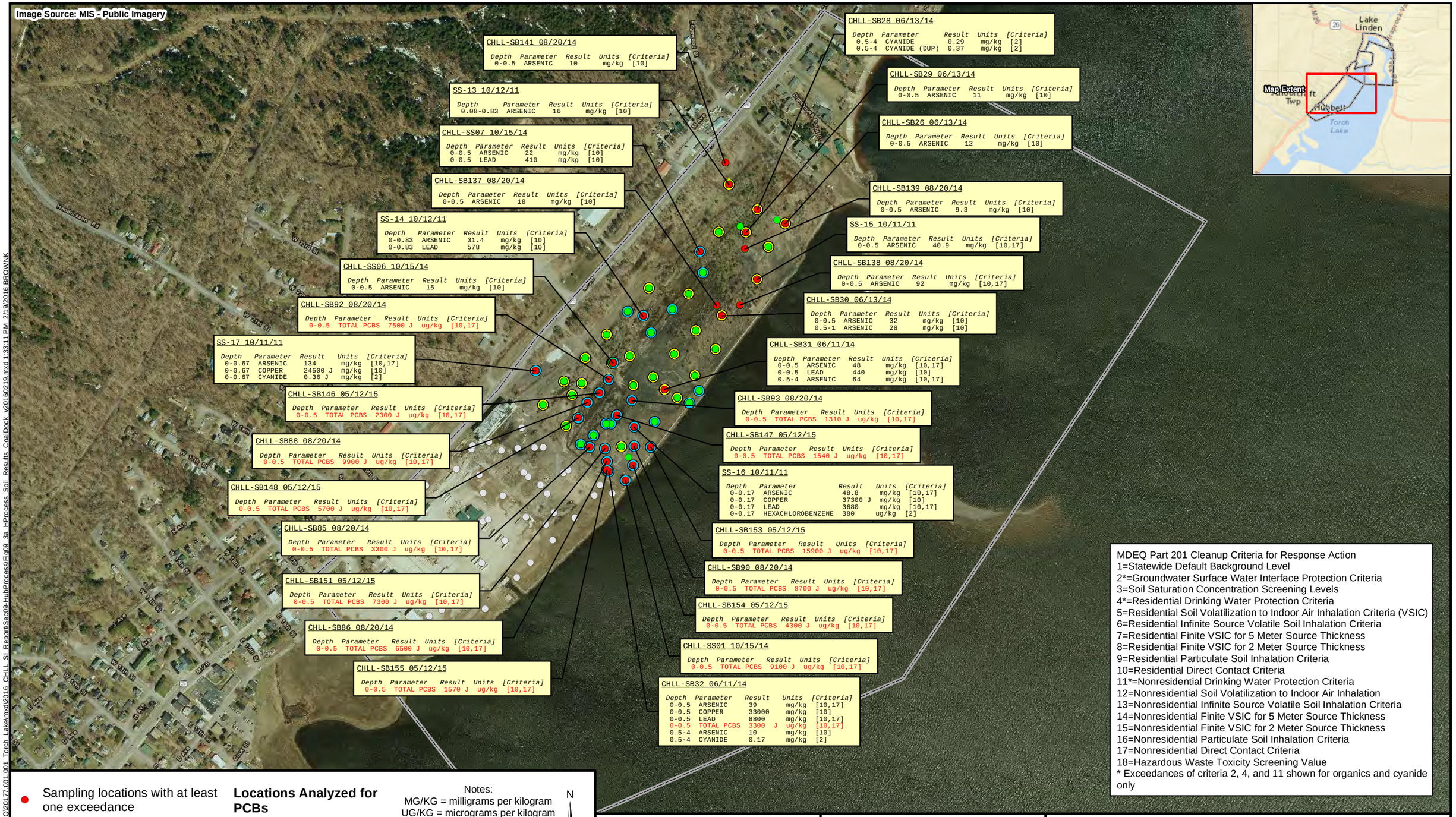
Image Source: MIS - Public Imagery
Map Extent
Lake Linden
Schoolcraft Twp
Hubbell
Torch Lake
Hedrickson Rd
W 2nd St
W 3rd St
W 4th St
W 5th St
W 6th St
W 7th St
W 8th St
W 9th St
W 10th St
W 11th St
W 12th St
W 13th St
W 14th St
W 15th St
W 16th St
W 17th St
W 18th St
W 19th St
W 20th St
Edgewood St
Lake Linden
Business Park Dr
Lake Linden
Lake Linden
Lake Linden

- Sampling locations with at least one exceedance
- Sampling locations with no exceedances
- Locations are included within a different geographical area boundary

**Locations Analyzed for PCBs**

- No Detections
- At Least One Detection
- Conceptual Site and Geographic Area Boundaries

Notes:
MG/KG = milligrams per kilogram
UG/KG = micrograms per kilogram
Sample depths shown in feet below ground surface.

N

0 200 Ft

Coordinate System: MIGeoRef(m)

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**Figure 9-3b**

Sample Analytical Result Map - Soil
Hubbell Processing Area - Mineral Building
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\2016_CHLL_SI_Report\Sec09-HubProcess\Fig09_3b_HProcess_Soil_Results_MineralBldg_v20160219.mxd 1:31:37 PM 2/19/2016 BROWNK

MDEQ Part 201 Cleanup Criteria for Response Action
1=Statewide Default Background Level
2*=Groundwater Surface Water Interface Protection Criteria
3=Soil Saturation Concentration Screening Levels
4*=Residential Drinking Water Protection Criteria
5=Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC)
6=Residential Infinite Source Volatile Soil Inhalation Criteria
7=Residential Finite VSIC for 5 Meter Source Thickness
8=Residential Finite VSIC for 2 Meter Source Thickness
9=Residential Particulate Soil Inhalation Criteria
10=Residential Direct Contact Criteria
11*=Nonresidential Drinking Water Protection Criteria
12=Nonresidential Soil Volatilization to Indoor Air Inhalation
13=Nonresidential Infinite Source Volatile Soil Inhalation Criteria
14=Nonresidential Finite VSIC for 5 Meter Source Thickness
15=Nonresidential Finite VSIC for 2 Meter Source Thickness
16=Nonresidential Particulate Soil Inhalation Criteria
17=Nonresidential Direct Contact Criteria
18=Hazardous Waste Toxicity Screening Value
* Exceedances of criteria 2, 4, and 11 shown for organics and cyanide only

- Sampling locations with at least one exceedance
- Sampling locations with no exceedances
- Locations are included within a different geographical area boundary

**Locations Analyzed for PCBs**

- No Detections
- At Least One Detection
- Conceptual Site and Geographic Area Boundaries

Notes:
MG/KG = milligrams per kilogram
UG/KG = micrograms per kilogram
Sample depths shown in feet below ground surface.

N

0 200 Ft

Coordinate System: MIGeoRef(m)

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**Figure 9-3c**
Sample Analytical Result Map - Soil
Hubbell Processing Area - Smelter
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\2016_CHLL_SI_Report\Sec09-HubProcess\Fin09_3c_HProcess_Soil_Results_Smelter_v20160219.mxd 1:32:35 PM 2/19/2016 BROWNK

**Locations Screened for Metals - At least one exceedance of:**

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria

- Screening locations with no exceedances
- Locations are included within a different geographical area boundary
- Conceptual Site and Geographic Area Boundaries

*Xray Fluorescence screening results are from surface soils unless otherwise specified.*

N

0 250 Ft

Coordinate System: MIGeoRef(m)

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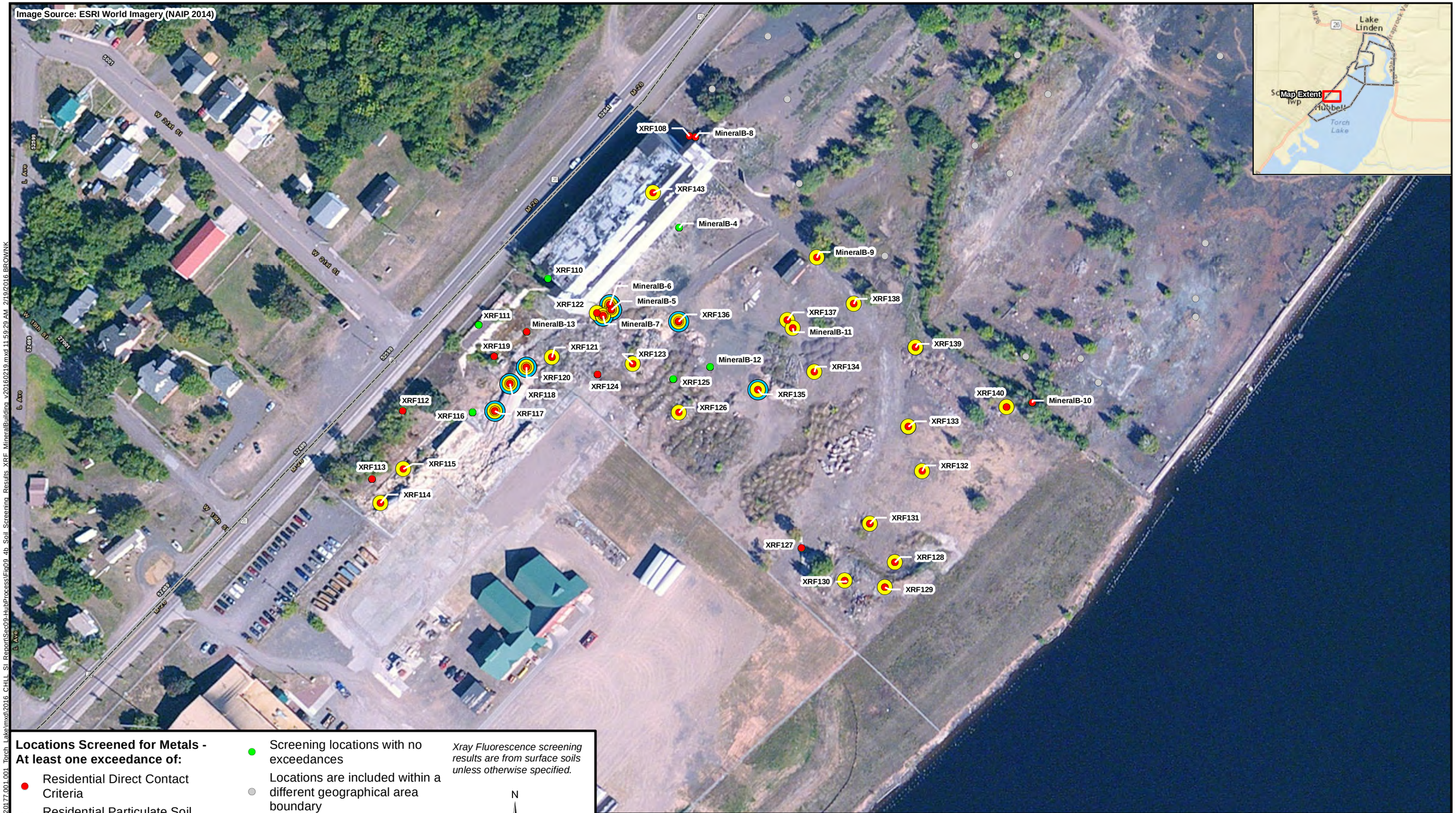
**Figure 9-4a**

Soil Screening Results Map - Soil
Hubbell Processing Area - Coal Dock
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\2016_CHLL_SI_Report\Sec09-HubProcess\Fig09_4a_Soil_Screening_Results_XRF_CoalDock_v20160219.mxd 11:56:23 AM 2/19/2016 B.BROWNK




**Locations Screened for Metals - At least one exceedance of:**

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria
- Screening locations with no exceedances
- Locations are included within a different geographical area boundary
- Conceptual Site and Geographic Area Boundaries

*Xray Fluorescence screening results are from surface soils unless otherwise specified.*

N

0 125 Ft

Coordinate System: MIGeoRef(m)

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**Figure 9-4b**

Soil Screening Results Map - Soil
Hubbell Processing Area - Mineral Building
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\2016_CHLL_SI_Report\Sec09-HubProcess\Fig09_4b_Soil_Screening_Results_XRF_MineralBuilding_v20160219.mxd 11:59:29 AM 2/19/2016 BROWNK

Sampling locations with at least one exceedance

Sampling locations with no exceedances

Locations are included within a different geographical area boundary

**Locations Analyzed for PCBs**

No Detections

At Least One Detection

Conceptual Site and Geographic Area Boundaries

Notes:
MG/L = milligrams per liter
UG/L = micrograms per liter
[#-#] = screen intervals
bgs = below ground surface

N

0 500 Ft

Coordinate System: MIGeoRef(m)

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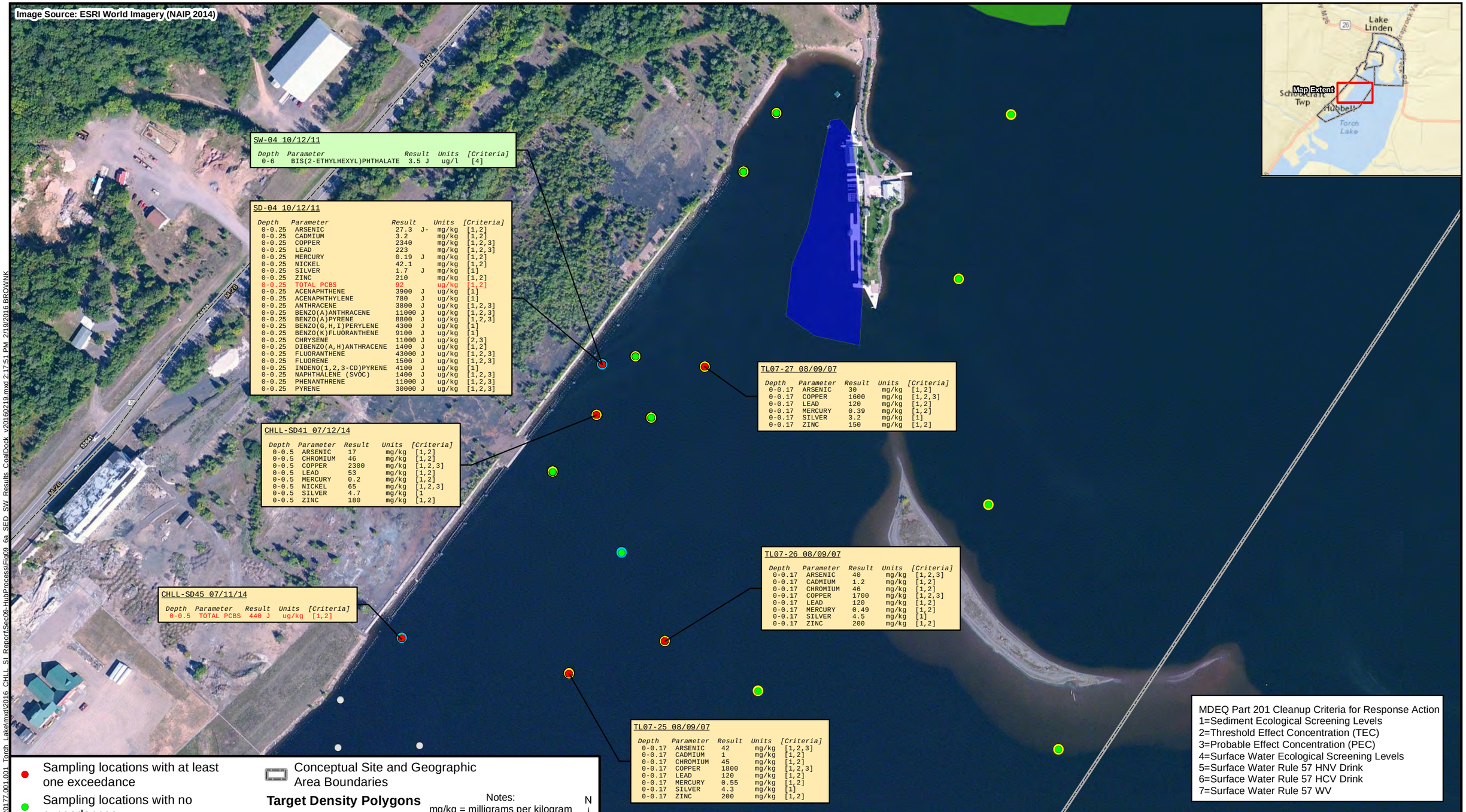
**Figure 9-5**

Sample Analytical Result Map - Groundwater
Hubbell Processing Area
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\Working Drafts\2015_CHLL_SI_Report\Sec09-HubProcess\Fig09_5_HubProcGW_Results_DRAFTv20151008.mxd 1:52:05 PM 2/19/2016 BROWNK




Sampling locations with at least one exceedance

Sampling locations with no exceedances

Locations are included within a different geographical area boundary

**Locations Analyzed for PCBs**

No Detections

At Least One Detection

Conceptual Site and Geographic Area Boundaries

**Target Density Polygons**

Low Density

Medium Density

High Density

Notes:
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
ug/l = micrograms per liter
Sample depths shown in feet below ground surface

N

0 250 Ft

Coordinate System: MIGeoRef(m)

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**Figure 9-6a**

Sample Analytical Result Map - Sediment and Surface Water
Hubbell Processing Area - Coal Dock
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\2016_CHLL_SI_Report\Sec09-HubProcess\Fig09_6a_SED_SW_Results_CoalDock_v20160219.mxd 2:17:51 PM 2/19/2016 BROWNK

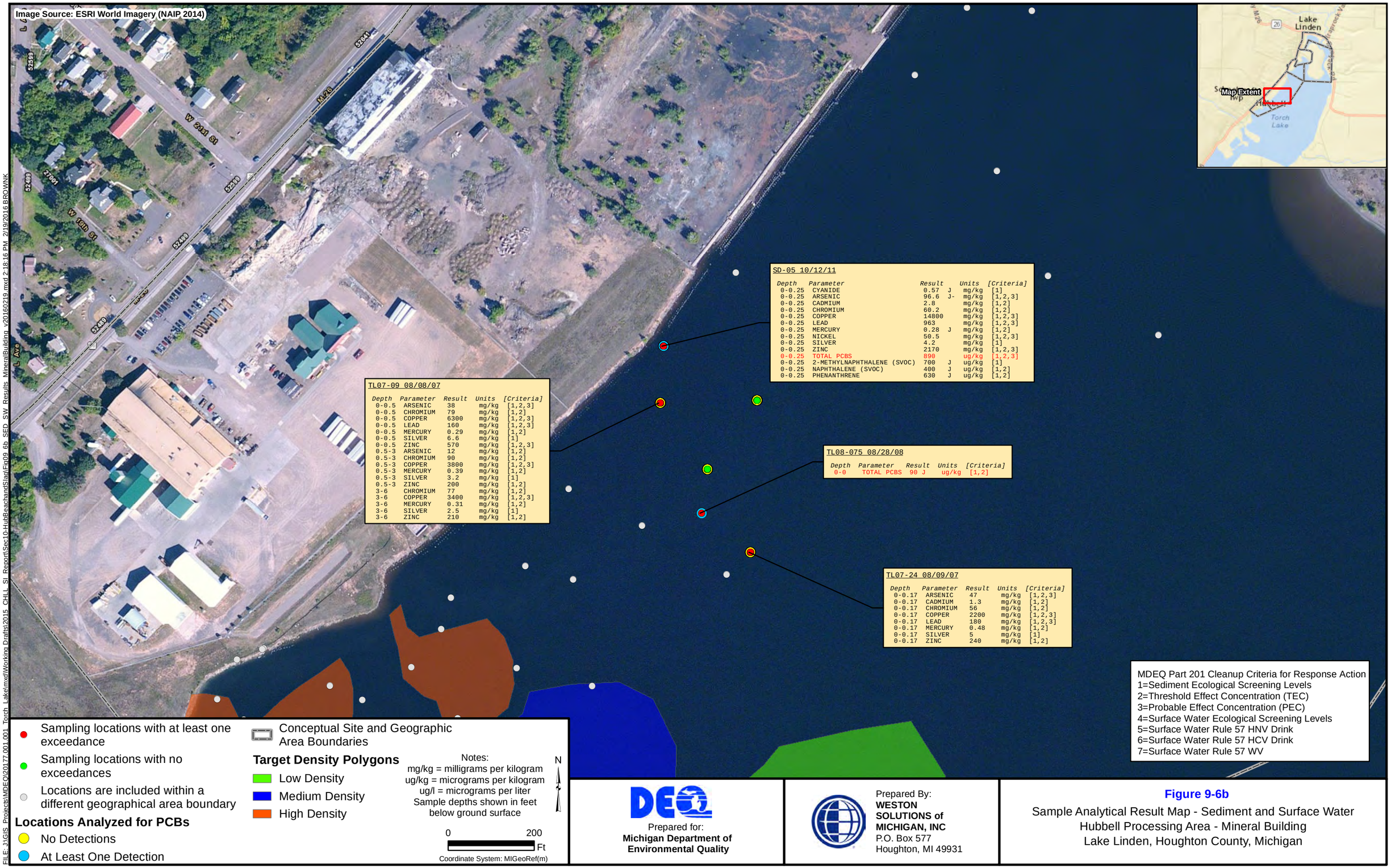
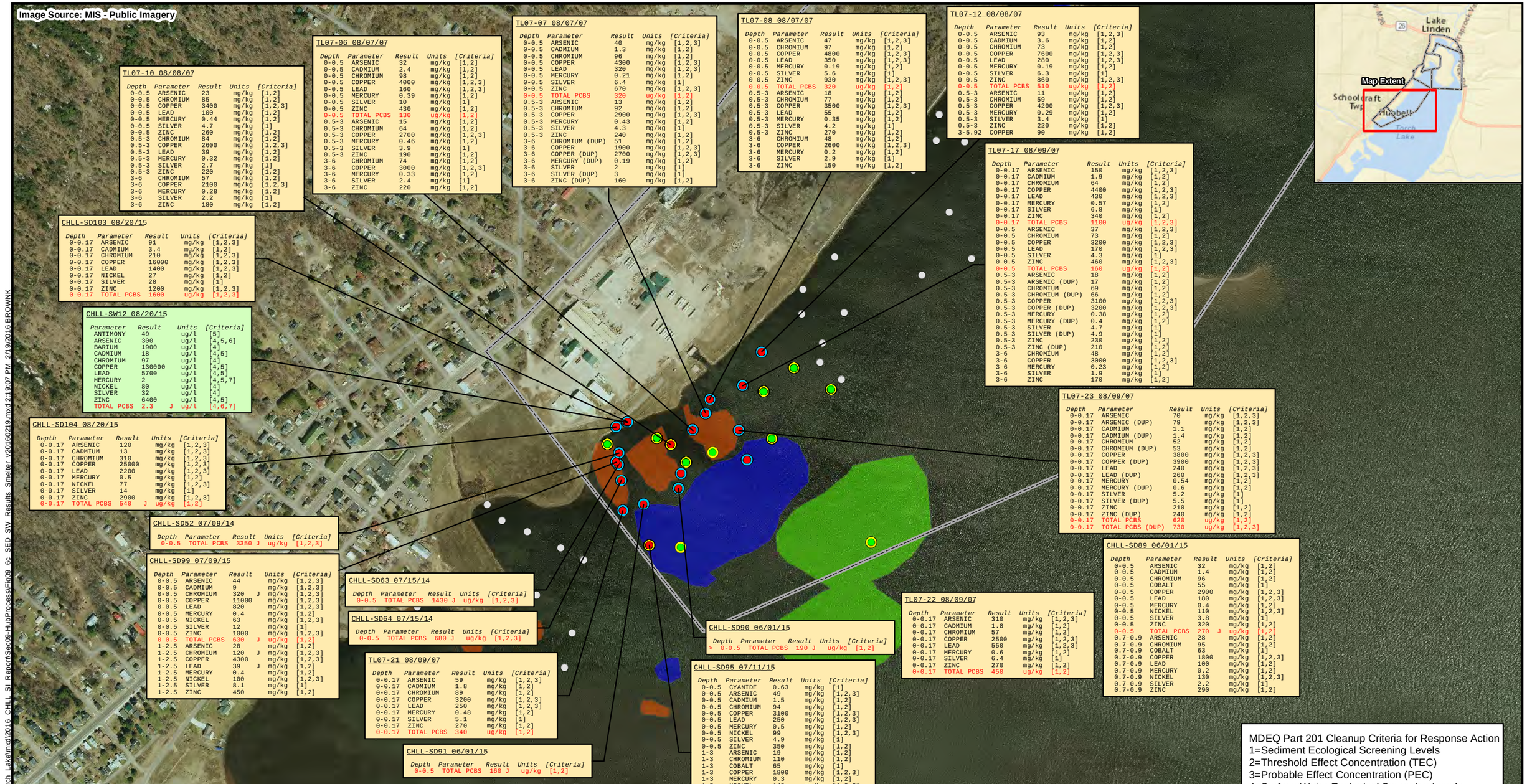



**Figure 9-6b**

Sample Analytical Result Map - Sediment and Surface Water
Hubbell Processing Area - Mineral Building
Lake Linden, Houghton County, Michigan

FILE: J:\GIS_Projects\MDEQ\20177.001.001_Torch_Lake\mxd\Working Drafts\2015_CHLL_SI_Report\Sec10-HubBeachandSlag\Fig09_6b_SED_SW_Results_MineralBuilding_v20160219.mxd 2:18:16 PM, 2/19/2016 BROWNK




**TL07-10 08/08/07**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.5 | ARSENIC | 23 | mg/kg | [1,2] |
| 0-0.5 | CHROMIUM | 85 | mg/kg | [1,2] |
| 0-0.5 | COPPER | 3400 | mg/kg | [1,2,3] |
| 0-0.5 | LEAD | 100 | mg/kg | [1,2] |
| 0-0.5 | MERCURY | 0.44 | mg/kg | [1,2] |
| 0-0.5 | SILVER | 4.7 | mg/kg | [1] |
| 0-0.5 | ZINC | 260 | mg/kg | [1,2] |
| 0.5-3 | CHROMIUM | 84 | mg/kg | [1,2] |
| 0.5-3 | COPPER | 2600 | mg/kg | [1,2,3] |
| 0.5-3 | LEAD | 39 | mg/kg | [1,2] |
| 0.5-3 | MERCURY | 0.32 | mg/kg | [1,2] |
| 0.5-3 | SILVER | 2.7 | mg/kg | [1] |
| 0.5-3 | ZINC | 220 | mg/kg | [1,2] |
| 3-6 | CHROMIUM | 57 | mg/kg | [1,2] |
| 3-6 | COPPER | 2100 | mg/kg | [1,2,3] |
| 3-6 | MERCURY | 0.28 | mg/kg | [1,2] |
| 3-6 | SILVER | 2.2 | mg/kg | [1] |
| 3-6 | ZINC | 180 | mg/kg | [1,2] |

**TL07-06 08/07/07**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.5 | ARSENIC | 32 | mg/kg | [1,2] |
| 0-0.5 | CADMIUM | 2.4 | mg/kg | [1,2] |
| 0-0.5 | CHROMIUM | 98 | mg/kg | [1,2] |
| 0-0.5 | COPPER | 4000 | mg/kg | [1,2,3] |
| 0-0.5 | LEAD | 160 | mg/kg | [1,2,3] |
| 0-0.5 | MERCURY | 0.39 | mg/kg | [1,2] |
| 0-0.5 | SILVER | 10 | mg/kg | [1] |
| 0-0.5 | ZINC | 430 | mg/kg | [1,2] |
| 0-0.5 | TOTAL PCBS | 130 | ug/kg | [1,2] |
| 0.5-3 | ARSENIC | 15 | mg/kg | [1,2] |
| 0.5-3 | CHROMIUM | 64 | mg/kg | [1,2] |
| 0.5-3 | COPPER | 2700 | mg/kg | [1,2,3] |
| 0.5-3 | MERCURY | 0.46 | mg/kg | [1,2] |
| 0.5-3 | SILVER | 3.9 | mg/kg | [1] |
| 0.5-3 | ZINC | 190 | mg/kg | [1,2] |
| 3-6 | CHROMIUM | 74 | mg/kg | [1,2] |
| 3-6 | COPPER | 3000 | mg/kg | [1,2,3] |
| 3-6 | MERCURY | 0.33 | mg/kg | [1,2] |
| 3-6 | SILVER | 2.4 | mg/kg | [1] |
| 3-6 | ZINC | 220 | mg/kg | [1,2] |

**TL07-07 08/07/07**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.5 | ARSENIC | 40 | mg/kg | [1,2,3] |
| 0-0.5 | CADMIUM | 1.3 | mg/kg | [1,2] |
| 0-0.5 | CHROMIUM | 96 | mg/kg | [1,2] |
| 0-0.5 | COPPER | 4300 | mg/kg | [1,2,3] |
| 0-0.5 | LEAD | 320 | mg/kg | [1,2,3] |
| 0-0.5 | MERCURY | 0.21 | mg/kg | [1,2] |
| 0-0.5 | SILVER | 6.4 | mg/kg | [1] |
| 0-0.5 | ZINC | 670 | mg/kg | [1,2,3] |
| 0-0.5 | TOTAL PCBS | 320 | ug/kg | [1,2] |
| 0.5-3 | ARSENIC | 13 | mg/kg | [1,2] |
| 0.5-3 | CHROMIUM | 92 | mg/kg | [1,2] |
| 0.5-3 | COPPER | 2900 | mg/kg | [1,2,3] |
| 0.5-3 | MERCURY | 0.43 | mg/kg | [1,2] |
| 0.5-3 | SILVER | 4.3 | mg/kg | [1] |
| 0.5-3 | ZINC | 240 | mg/kg | [1,2] |
| 3-6 | CHROMIUM (DUP) | 51 | mg/kg | [1,2] |
| 3-6 | COPPER | 1900 | mg/kg | [1,2,3] |
| 3-6 | COPPER (DUP) | 2700 | mg/kg | [1,2,3] |
| 3-6 | MERCURY (DUP) | 0.19 | mg/kg | [1,2] |
| 3-6 | SILVER | 2 | mg/kg | [1] |
| 3-6 | SILVER (DUP) | 3 | mg/kg | [1] |
| 3-6 | ZINC (DUP) | 160 | mg/kg | [1,2] |

**TL07-08 08/07/07**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.5 | ARSENIC | 47 | mg/kg | [1,2,3] |
| 0-0.5 | CHROMIUM | 97 | mg/kg | [1,2] |
| 0-0.5 | COPPER | 4800 | mg/kg | [1,2,3] |
| 0-0.5 | LEAD | 350 | mg/kg | [1,2,3] |
| 0-0.5 | MERCURY | 0.19 | mg/kg | [1,2] |
| 0-0.5 | SILVER | 5.6 | mg/kg | [1] |
| 0-0.5 | ZINC | 930 | mg/kg | [1,2,3] |
| 0-0.5 | TOTAL PCBS | 320 | ug/kg | [1,2] |
| 0.5-3 | ARSENIC | 18 | mg/kg | [1,2] |
| 0.5-3 | CHROMIUM | 77 | mg/kg | [1,2] |
| 0.5-3 | COPPER | 3500 | mg/kg | [1,2,3] |
| 0.5-3 | LEAD | 55 | mg/kg | [1,2] |
| 0.5-3 | MERCURY | 0.35 | mg/kg | [1,2] |
| 0.5-3 | SILVER | 4.2 | mg/kg | [1] |
| 0.5-3 | ZINC | 270 | mg/kg | [1,2] |
| 3-6 | CHROMIUM | 48 | mg/kg | [1,2] |
| 3-6 | COPPER | 2600 | mg/kg | [1,2,3] |
| 3-6 | MERCURY | 0.2 | mg/kg | [1,2] |
| 3-6 | SILVER | 2.9 | mg/kg | [1] |
| 3-6 | ZINC | 150 | mg/kg | [1,2] |

**TL07-12 08/08/07**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.5 | ARSENIC | 93 | mg/kg | [1,2,3] |
| 0-0.5 | CADMIUM | 3.6 | mg/kg | [1,2] |
| 0-0.5 | CHROMIUM | 73 | mg/kg | [1,2] |
| 0-0.5 | COPPER | 7600 | mg/kg | [1,2,3] |
| 0-0.5 | LEAD | 280 | mg/kg | [1,2,3] |
| 0-0.5 | MERCURY | 0.19 | mg/kg | [1,2] |
| 0-0.5 | SILVER | 6.3 | mg/kg | [1] |
| 0-0.5 | ZINC | 860 | mg/kg | [1,2,3] |
| 0-0.5 | TOTAL PCBS | 510 | ug/kg | [1,2] |
| 0.5-3 | ARSENIC | 11 | mg/kg | [1,2] |
| 0.5-3 | CHROMIUM | 59 | mg/kg | [1,2] |
| 0.5-3 | COPPER | 4200 | mg/kg | [1,2,3] |
| 0.5-3 | MERCURY | 0.29 | mg/kg | [1,2] |
| 0.5-3 | SILVER | 3.4 | mg/kg | [1] |
| 0.5-3 | ZINC | 220 | mg/kg | [1,2] |
| 3-5.92 | COPPER | 90 | mg/kg | [1,2] |

**TL07-17 08/09/07**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.17 | ARSENIC | 150 | mg/kg | [1,2,3] |
| 0-0.17 | CADMIUM | 1.9 | mg/kg | [1,2] |
| 0-0.17 | CHROMIUM | 64 | mg/kg | [1,2] |
| 0-0.17 | COPPER | 4400 | mg/kg | [1,2,3] |
| 0-0.17 | LEAD | 430 | mg/kg | [1,2,3] |
| 0-0.17 | MERCURY | 0.57 | mg/kg | [1,2] |
| 0-0.17 | SILVER | 6.8 | mg/kg | [1] |
| 0-0.17 | ZINC | 340 | mg/kg | [1,2] |
| 0-0.17 | TOTAL PCBS | 1100 | ug/kg | [1,2,3] |
| 0-0.5 | ARSENIC | 37 | mg/kg | [1,2,3] |
| 0-0.5 | CHROMIUM | 73 | mg/kg | [1,2] |
| 0-0.5 | COPPER | 3200 | mg/kg | [1,2,3] |
| 0-0.5 | LEAD | 170 | mg/kg | [1,2,3] |
| 0-0.5 | SILVER | 4.3 | mg/kg | [1] |
| 0-0.5 | ZINC | 460 | mg/kg | [1,2,3] |
| 0-0.5 | TOTAL PCBS | 160 | ug/kg | [1,2] |
| 0.5-3 | ARSENIC | 18 | mg/kg | [1,2] |
| 0.5-3 | ARSENIC (DUP) | 17 | mg/kg | [1,2] |
| 0.5-3 | CHROMIUM | 69 | mg/kg | [1,2] |
| 0.5-3 | CHROMIUM (DUP) | 66 | mg/kg | [1,2] |
| 0.5-3 | COPPER | 3100 | mg/kg | [1,2,3] |
| 0.5-3 | COPPER (DUP) | 3200 | mg/kg | [1,2,3] |
| 0.5-3 | MERCURY | 0.38 | mg/kg | [1,2] |
| 0.5-3 | MERCURY (DUP) | 0.4 | mg/kg | [1,2] |
| 0.5-3 | SILVER | 4.7 | mg/kg | [1] |
| 0.5-3 | SILVER (DUP) | 4.9 | mg/kg | [1] |
| 0.5-3 | ZINC | 230 | mg/kg | [1,2] |
| 0.5-3 | ZINC (DUP) | 210 | mg/kg | [1,2] |
| 3-6 | CHROMIUM | 48 | mg/kg | [1,2] |
| 3-6 | COPPER | 3000 | mg/kg | [1,2,3] |
| 3-6 | MERCURY | 0.23 | mg/kg | [1,2] |
| 3-6 | SILVER | 1.9 | mg/kg | [1] |
| 3-6 | ZINC | 170 | mg/kg | [1,2] |

**CHLL-SD103 08/20/15**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.17 | ARSENIC | 91 | mg/kg | [1,2,3] |
| 0-0.17 | CADMIUM | 3.4 | mg/kg | [1,2] |
| 0-0.17 | CHROMIUM | 210 | mg/kg | [1,2,3] |
| 0-0.17 | COPPER | 16000 | mg/kg | [1,2,3] |
| 0-0.17 | LEAD | 1400 | mg/kg | [1,2,3] |
| 0-0.17 | NICKEL | 27 | mg/kg | [1,2] |
| 0-0.17 | SILVER | 28 | mg/kg | [1] |
| 0-0.17 | ZINC | 1200 | mg/kg | [1,2,3] |
| 0-0.17 | TOTAL PCBS | 1600 | ug/kg | [1,2,3] |

**CHLL-SW12 08/20/15**

| Parameter | Result | | Units | [Criteria] |
|---|---|---|---|---|
| ANTIMONY | 49 | | ug/l | [5] |
| ARSENIC | 300 | | ug/l | [4,5,6] |
| BARIUM | 1900 | | ug/l | [4] |
| CADMIUM | 18 | | ug/l | [4,5] |
| CHROMIUM | 97 | | ug/l | [4] |
| COPPER | 130000 | | ug/l | [4,5] |
| LEAD | 5700 | | ug/l | [4,5] |
| MERCURY | 2 | | ug/l | [4,5,7] |
| NICKEL | 80 | | ug/l | [4] |
| SILVER | 32 | | ug/l | [4] |
| ZINC | 6400 | | ug/l | [4,5] |
| TOTAL PCBS | 2.3 | J | ug/l | [4,6,7] |

**CHLL-SD104 08/20/15**

| Depth | Parameter | Result | | Units | [Criteria] |
|---|---|---|---|---|---|
| 0-0.17 | ARSENIC | 120 | | mg/kg | [1,2,3] |
| 0-0.17 | CADMIUM | 13 | | mg/kg | [1,2,3] |
| 0-0.17 | CHROMIUM | 310 | | mg/kg | [1,2,3] |
| 0-0.17 | COPPER | 25000 | | mg/kg | [1,2,3] |
| 0-0.17 | LEAD | 2200 | | mg/kg | [1,2,3] |
| 0-0.17 | MERCURY | 0.5 | | mg/kg | [1,2] |
| 0-0.17 | NICKEL | 77 | | mg/kg | [1,2,3] |
| 0-0.17 | SILVER | 14 | | mg/kg | [1] |
| 0-0.17 | ZINC | 2900 | | mg/kg | [1,2,3] |
| 0-0.17 | TOTAL PCBS | 540 | J | ug/kg | [1,2] |

**CHLL-SD52 07/09/14**

| Depth | Parameter | Result | | Units | [Criteria] |
|---|---|---|---|---|---|
| 0-0.5 | TOTAL PCBS | 3350 | J | ug/kg | [1,2,3] |

**CHLL-SD99 07/09/15**

| Depth | Parameter | Result | | Units | [Criteria] |
|---|---|---|---|---|---|
| 0-0.5 | ARSENIC | 44 | | mg/kg | [1,2,3] |
| 0-0.5 | CADMIUM | 9 | | mg/kg | [1,2,3] |
| 0-0.5 | CHROMIUM | 320 | J | mg/kg | [1,2,3] |
| 0-0.5 | COPPER | 11000 | | mg/kg | [1,2,3] |
| 0-0.5 | LEAD | 820 | | mg/kg | [1,2,3] |
| 0-0.5 | MERCURY | 0.4 | | mg/kg | [1,2] |
| 0-0.5 | NICKEL | 63 | | mg/kg | [1,2,3] |
| 0-0.5 | SILVER | 12 | | mg/kg | [1] |
| 0-0.5 | ZINC | 1000 | | mg/kg | [1,2,3] |
| 0-0.5 | TOTAL PCBS | 630 | J | ug/kg | [1,2] |
| 1-2.5 | ARSENIC | 28 | | mg/kg | [1,2] |
| 1-2.5 | CHROMIUM | 120 | J | mg/kg | [1,2,3] |
| 1-2.5 | COPPER | 4300 | | mg/kg | [1,2,3] |
| 1-2.5 | LEAD | 39 | J | mg/kg | [1,2] |
| 1-2.5 | MERCURY | 0.4 | | mg/kg | [1,2] |
| 1-2.5 | NICKEL | 100 | | mg/kg | [1,2,3] |
| 1-2.5 | SILVER | 8.1 | | mg/kg | [1] |
| 1-2.5 | ZINC | 450 | | mg/kg | [1,2] |

**CHLL-SD63 07/15/14**

| Depth | Parameter | Result | | Units | [Criteria] |
|---|---|---|---|---|---|
| 0-0.5 | TOTAL PCBS | 1430 | J | ug/kg | [1,2,3] |

**CHLL-SD64 07/15/14**

| Depth | Parameter | Result | | Units | [Criteria] |
|---|---|---|---|---|---|
| 0-0.5 | TOTAL PCBS | 680 | J | ug/kg | [1,2,3] |

**TL07-21 08/09/07**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.17 | ARSENIC | 59 | mg/kg | [1,2,3] |
| 0-0.17 | CADMIUM | 1.8 | mg/kg | [1,2] |
| 0-0.17 | CHROMIUM | 89 | mg/kg | [1,2] |
| 0-0.17 | COPPER | 3200 | mg/kg | [1,2,3] |
| 0-0.17 | LEAD | 250 | mg/kg | [1,2,3] |
| 0-0.17 | MERCURY | 0.48 | mg/kg | [1,2] |
| 0-0.17 | SILVER | 5.1 | mg/kg | [1] |
| 0-0.17 | ZINC | 270 | mg/kg | [1,2] |
| 0-0.17 | TOTAL PCBS | 340 | ug/kg | [1,2] |

**CHLL-SD91 06/01/15**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.5 | TOTAL PCBS | 160 | J ug/kg | [1,2] |

**CHLL-SD90 06/01/15**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| > 0-0.5 | TOTAL PCBS | 190 | J ug/kg | [1,2] |

**CHLL-SD95 07/11/15**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.5 | CYANIDE | 0.63 | mg/kg | [1] |
| 0-0.5 | ARSENIC | 49 | mg/kg | [1,2,3] |
| 0-0.5 | CADMIUM | 1.5 | mg/kg | [1,2] |
| 0-0.5 | CHROMIUM | 94 | mg/kg | [1,2] |
| 0-0.5 | COPPER | 3100 | mg/kg | [1,2,3] |
| 0-0.5 | LEAD | 250 | mg/kg | [1,2,3] |
| 0-0.5 | MERCURY | 0.5 | mg/kg | [1,2] |
| 0-0.5 | NICKEL | 99 | mg/kg | [1,2,3] |
| 0-0.5 | SILVER | 4.9 | mg/kg | [1] |
| 0-0.5 | ZINC | 350 | mg/kg | [1,2] |
| 1-3 | ARSENIC | 19 | mg/kg | [1,2] |
| 1-3 | CHROMIUM | 110 | mg/kg | [1,2] |
| 1-3 | COBALT | 65 | mg/kg | [1] |
| 1-3 | COPPER | 1800 | mg/kg | [1,2,3] |
| 1-3 | MERCURY | 0.3 | mg/kg | [1,2] |
| 1-3 | NICKEL | 140 | mg/kg | [1,2,3] |
| 1-3 | SILVER | 6.5 | mg/kg | [1] |
| 1-3 | ZINC | 310 | mg/kg | [1,2] |
| 3-5 | CHROMIUM | 61 | mg/kg | [1,2] |
| 3-5 | COPPER | 1600 | mg/kg | [1,2,3] |
| 3-5 | MERCURY | 0.6 | mg/kg | [1,2] |
| 3-5 | NICKEL | 85 | mg/kg | [1,2,3] |
| 3-5 | SILVER | 6.1 | mg/kg | [1] |
| 3-5 | ZINC | 170 | mg/kg | [1,2] |

**TL07-22 08/09/07**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.17 | ARSENIC | 310 | mg/kg | [1,2,3] |
| 0-0.17 | CADMIUM | 1.8 | mg/kg | [1,2] |
| 0-0.17 | CHROMIUM | 57 | mg/kg | [1,2] |
| 0-0.17 | COPPER | 2500 | mg/kg | [1,2,3] |
| 0-0.17 | LEAD | 550 | mg/kg | [1,2,3] |
| 0-0.17 | MERCURY | 0.6 | mg/kg | [1,2] |
| 0-0.17 | SILVER | 6.4 | mg/kg | [1] |
| 0-0.17 | ZINC | 270 | mg/kg | [1,2] |
| 0-0.17 | TOTAL PCBS | 450 | ug/kg | [1,2] |

**TL07-23 08/09/07**

| Depth | Parameter | Result | Units | [Criteria] |
|---|---|---|---|---|
| 0-0.17 | ARSENIC | 70 | mg/kg | [1,2,3] |
| 0-0.17 | ARSENIC (DUP) | 79 | mg/kg | [1,2,3] |
| 0-0.17 | CADMIUM | 1.1 | mg/kg | [1,2] |
| 0-0.17 | CADMIUM (DUP) | 1.4 | mg/kg | [1,2] |
| 0-0.17 | CHROMIUM | 52 | mg/kg | [1,2] |
| 0-0.17 | CHROMIUM (DUP) | 53 | mg/kg | [1,2] |
| 0-0.17 | COPPER | 3800 | mg/kg | [1,2,3] |
| 0-0.17 | COPPER (DUP) | 3900 | mg/kg | [1,2,3] |
| 0-0.17 | LEAD | 240 | mg/kg | [1,2,3] |
| 0-0.17 | LEAD (DUP) | 260 | mg/kg | [1,2,3] |
| 0-0.17 | MERCURY | 0.54 | mg/kg | [1,2] |
| 0-0.17 | MERCURY (DUP) | 0.6 | mg/kg | [1,2] |
| 0-0.17 | SILVER | 5.2 | mg/kg | [1] |
| 0-0.17 | SILVER (DUP) | 5.5 | mg/kg | [1] |
| 0-0.17 | ZINC | 210 | mg/kg | [1,2] |
| 0-0.17 | ZINC (DUP) | 240 | mg/kg | [1,2] |
| 0-0.17 | TOTAL PCBS | 620 | ug/kg | [1,2] |
| 0-0.17 | TOTAL PCBS (DUP) | 730 | ug/kg | [1,2,3] |

**CHLL-SD89 06/01/15**

| Depth | Parameter | Result | | Units | [Criteria] |
|---|---|---|---|---|---|
| 0-0.5 | ARSENIC | 32 | | mg/kg | [1,2] |
| 0-0.5 | CADMIUM | 1.4 | | mg/kg | [1,2] |
| 0-0.5 | CHROMIUM | 96 | | mg/kg | [1,2] |
| 0-0.5 | COBALT | 55 | | mg/kg | [1] |
| 0-0.5 | COPPER | 2900 | | mg/kg | [1,2,3] |
| 0-0.5 | LEAD | 180 | | mg/kg | [1,2,3] |
| 0-0.5 | MERCURY | 0.4 | | mg/kg | [1,2] |
| 0-0.5 | NICKEL | 110 | | mg/kg | [1,2,3] |
| 0-0.5 | SILVER | 3.8 | | mg/kg | [1] |
| 0-0.5 | ZINC | 320 | | mg/kg | [1,2] |
| 0-0.5 | TOTAL PCBS | 270 | J | ug/kg | [1,2] |
| 0.7-0.9 | ARSENIC | 28 | | mg/kg | [1,2] |
| 0.7-0.9 | CHROMIUM | 95 | | mg/kg | [1,2] |
| 0.7-0.9 | COBALT | 63 | | mg/kg | [1] |
| 0.7-0.9 | COPPER | 1800 | | mg/kg | [1,2,3] |
| 0.7-0.9 | LEAD | 100 | | mg/kg | [1,2] |
| 0.7-0.9 | MERCURY | 0.2 | | mg/kg | [1,2] |
| 0.7-0.9 | NICKEL | 130 | | mg/kg | [1,2,3] |
| 0.7-0.9 | SILVER | 2.2 | | mg/kg | [1] |
| 0.7-0.9 | ZINC | 290 | | mg/kg | [1,2] |

MDEQ Part 201 Cleanup Criteria for Response Action
1=Sediment Ecological Screening Levels
2=Threshold Effect Concentration (TEC)
3=Probable Effect Concentration (PEC)
4=Surface Water Ecological Screening Levels
5=Surface Water Rule 57 HNV Drink
6=Surface Water Rule 57 HCV Drink
7=Surface Water Rule 57 WV

- Sampling locations with at least one exceedance
- Sampling locations with no exceedances
- Locations are included within a different geographical area boundary

**Locations Analyzed for PCBs**

- No Detections
- At Least One Detection

Conceptual Site and Geographic Area Boundaries

**Target Density Polygons**

- Low Density
- Medium Density
- High Density

Notes:
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
ug/l = micrograms per liter
Sample depths shown in feet below ground surface

N

0 500 Ft

Coordinate System: MIGeoRef(m)

Prepared for:
**Michigan Department of Environmental Quality**

Prepared By:
**WESTON SOLUTIONS of MICHIGAN, INC**
P.O. Box 577
Houghton, MI 49931

**Figure 9-6c**

Sample Analytical Result Map - Sediment and Surface Water
Hubbell Processing Area - Smelter
Lake Linden, Houghton County, Michigan

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**Sampling Location Type**

- Abandoned Container
- Groundwater
- Residual Process Material
- Sediment
- Soil; Surface Soil
- Surface Water
- Waste Pile

RED Symbols = Location with PCB exceedance

YELLOW Symbols = Location with PCBs detected but no exceedance

GREEN Symbols = Location sampled for PCBs but not detected

Conceptual Site and Geographic Area Boundaries

N

0 525 Ft

Coordinate System: MIGeoRef(m)

Prepared for:
**Michigan Department of Environmental Quality**

Prepared By:
**WESTON SOLUTIONS of MICHIGAN, INC**
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**Figure 9-7**
Summary of PCB Detections Map
All Media
Hubbell Processing Area
Lake Linden, Houghton County, Michigan

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