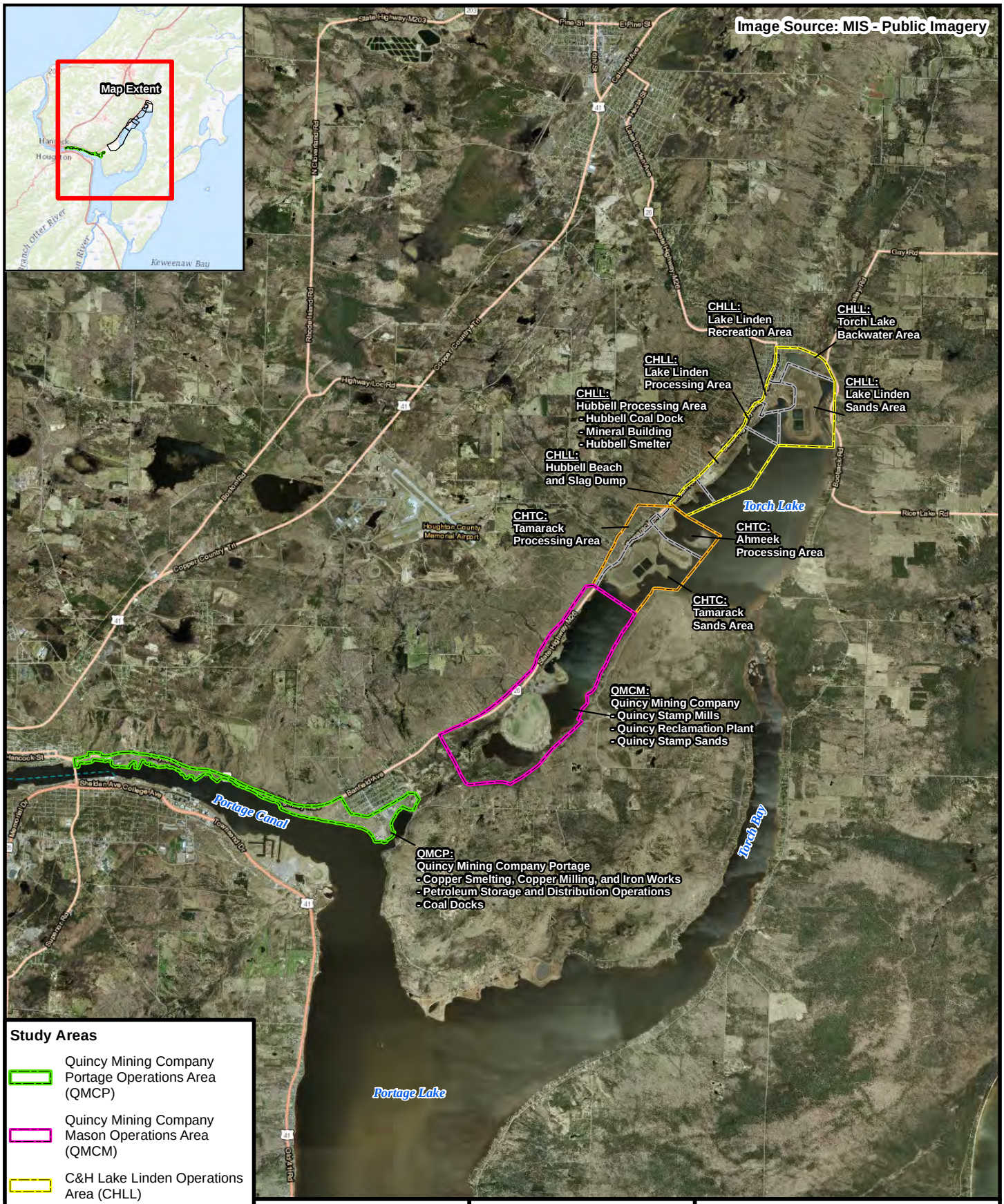

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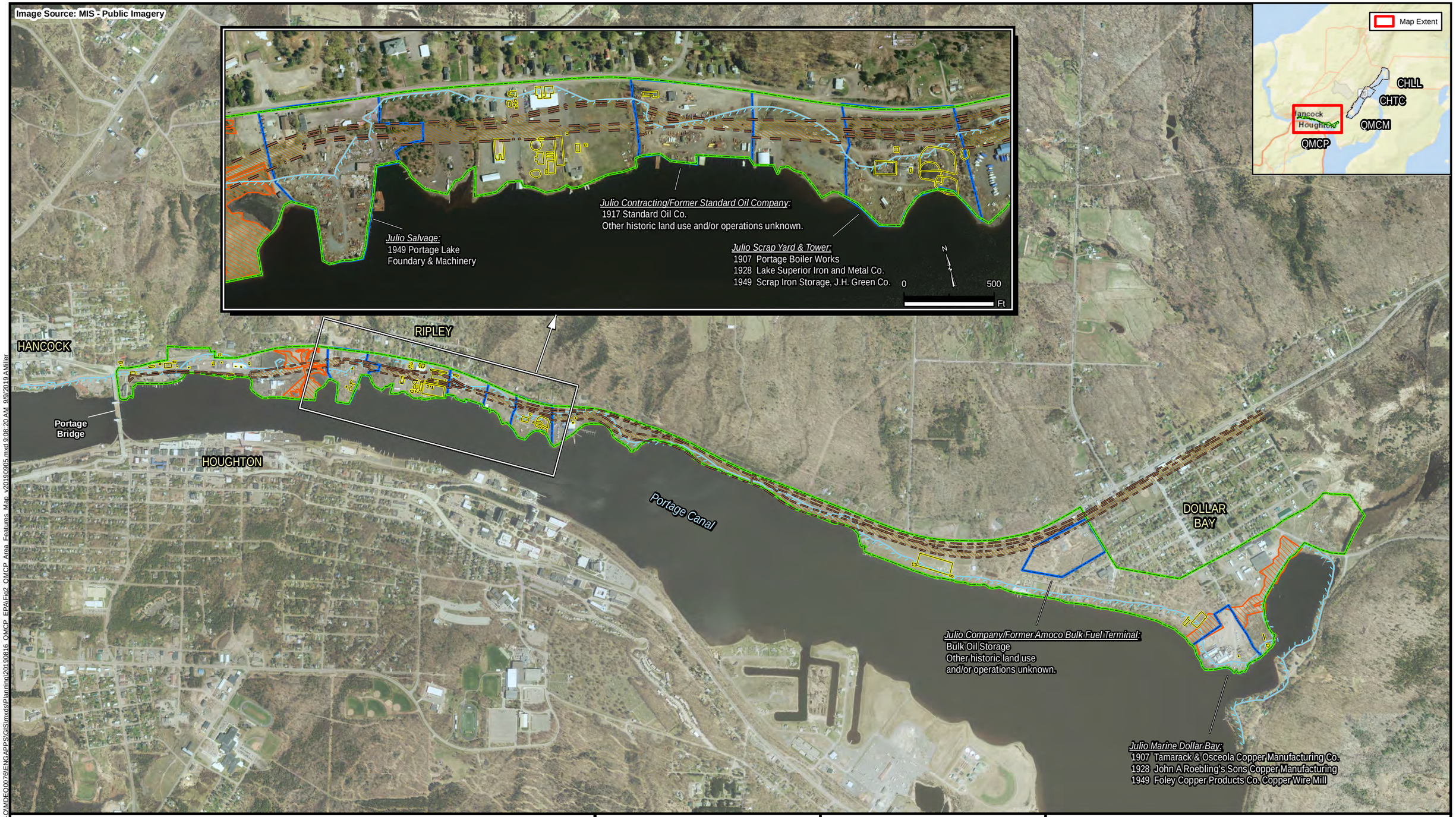
Figure 1

Project Location Map
Houghton County,
Michigan

FILE: W:\Projects\Projects K-O\MDEQ076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPAFig1_QMCP_Project_Location_v20190827.mxd 5:00:19 PM 8/27/2019 AMiller



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Copper Heritage Trail ROW

1865 Shoreline

QMCP Study Area Boundary

Approximate Parcel Boundaries

Features Identified on Sanborn Maps

EPA Cap Boundary

Notes:
Historic land use and/or operations refer to noted years on available Sanborn Maps.

N

0 1,500 Ft

Coordinate System: MIGeoRef(m)

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Figure 2
Area Features Map
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

DATA SOURCES

Sample IDs	Date Range
1) **QMCP-ASBBLK...**	**September 2018**

-EGLE RRD. *SI results not published.*

-Bulk Oil Storage
-Other historic land use and/or operations unknown.

Sample with Asbestos Not Detected

1865 Shoreline
Copper Heritage Trail ROW
Approximate Parcel Boundaries
QMCP Study Area Boundary

N

0 125 Ft

Coordinate System: MIGeoRef(m)

Notes:
- Underlying imagery from Michigan Imagery Solution (Houghton - 2013)

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Figure 3 **DRAFT**

Sample Analytical Result Map - Suspect Asbestos Containing Material
Julio Company/Former Amoco Bulk Fuel Terminal
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig3_QMCP_ASBBLK_v20190905.mxd 8:41:03 AM 9/9/2019 AMiller

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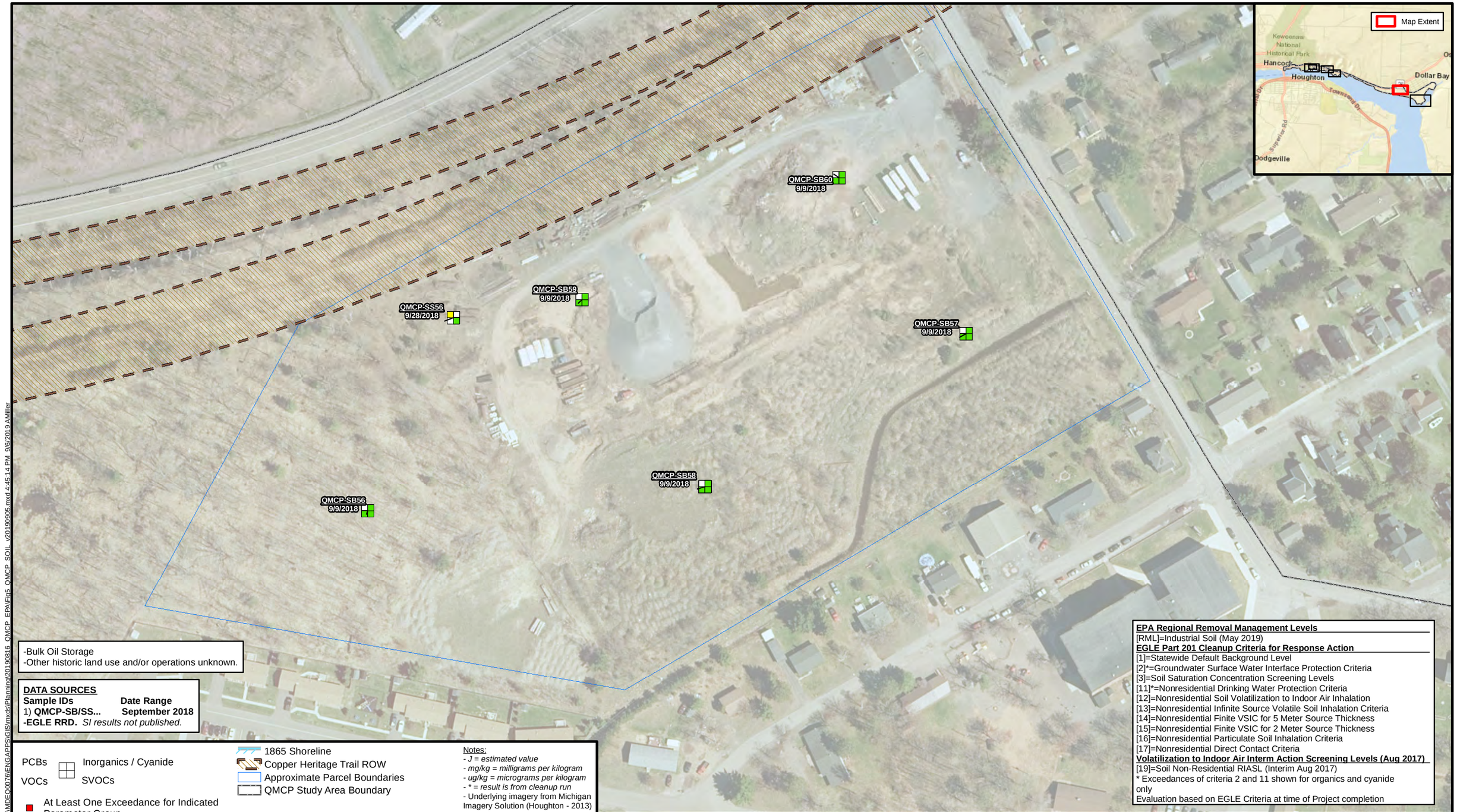
Figure 4

DRAFT

Sample Analytical Result Map - Residual Process Material, Abandoned Container, and Waste - Julio Company/Former Amoco Bulk Fuel Terminal
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPAFig4_QMCP_RPM_AC_Waste_v20190905(P1-3of4).mxd 8:59:24 AM, 9/9/2019 AMiller



-Bulk Oil Storage
-Other historic land use and/or operations unknown.

DATA SOURCES

Sample IDs	Date Range
1) **QMCP-SB/SS...**	**September 2018**

-EGLE RRD. *SI results not published.*

EPA Regional Removal Management Levels
[RML]=Industrial Soil (May 2019)
EGLE 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
[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
Volatilization to Indoor Air Interm Action Screening Levels (Aug 2017)
[19]=Soil Non-Residential RIASL (Interim Aug 2017)
* Exceedances of criteria 2 and 11 shown for organics and cyanide only
Evaluation based on EGLE Criteria at time of Project completion

PCBs
VOCs
Inorganics / Cyanide
SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

1865 Shoreline
Copper Heritage Trail ROW
Approximate Parcel Boundaries
QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *ug/kg = micrograms per kilogram*
- ** = result is from cleanup run*
- Underlying imagery from Michigan Imagery Solution (Houghton - 2013)

N
0 125 Ft
Coordinate System: MIGeoRef(m)

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Figure 5 *DRAFT*

Sample Analytical Result Map - Soil
Julio Company/Former Amoco Bulk Fuel Terminal
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig5_QMCP_SOIL_v20190905.mxd 4:45:14 PM 9/6/2019 AMiller

-Bulk Oil Storage
-Other historic land use and/or operations unknown.

DATA SOURCES

Sample IDs	Date Range
1) **QMCP-GW...**	**September 2018**

-EGLE RRD. *SI results not published*

EPA Regional Removal Management Levels
[RML]=Residential Tapwater (May 2019)
EGLE Part 201 Cleanup Criteria for Response Action
[2]*=Nonresidential Drinking Water Criteria
[3]*=Groundwater Surface Water Interface Criteria
[5]=Nonresidential Groundwater Vol to Indoor Air Inhalation
[6]=Water Solubility
[7]=Flammability and Explosivity Screening Level
Volatilization to Indoor Air Interim Action Screening Levels (Aug 2017)
[9]=Shallow Groundwater Non-Residential RIASL
[12]=Groundwater Non-Residential RIASL
[13]=Groundwater Non-Residential $RIASL_{12}$
[14]=Groundwater Non-Residential $TSRIASL_{12}$
* Exceedances of criteria 2, and 3 are shown for organics only
Evaluation based on EGLE Criteria at time of Project completion

PCBs
VOCs
Inorganics / Cyanide
SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

- 1865 Shoreline
- Copper Heritage Trail ROW
- Features Identified on Sanborn Maps
- Approximate Parcel Boundaries
- QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *ug/l = micrograms per liter*
- *# = results are from laboratory cleanup run*

N
0 130 Ft
Coordinate System: MIGeoRef(m)

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DRAFT

Figure 6
Sample Analytical Results Map - Groundwater
Julio Company/Former Amoco Bulk Fuel Terminal
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPAFig6_QMCP_GW_v20190905.mxd 4:33:40 PM 9/6/2019 AMiller

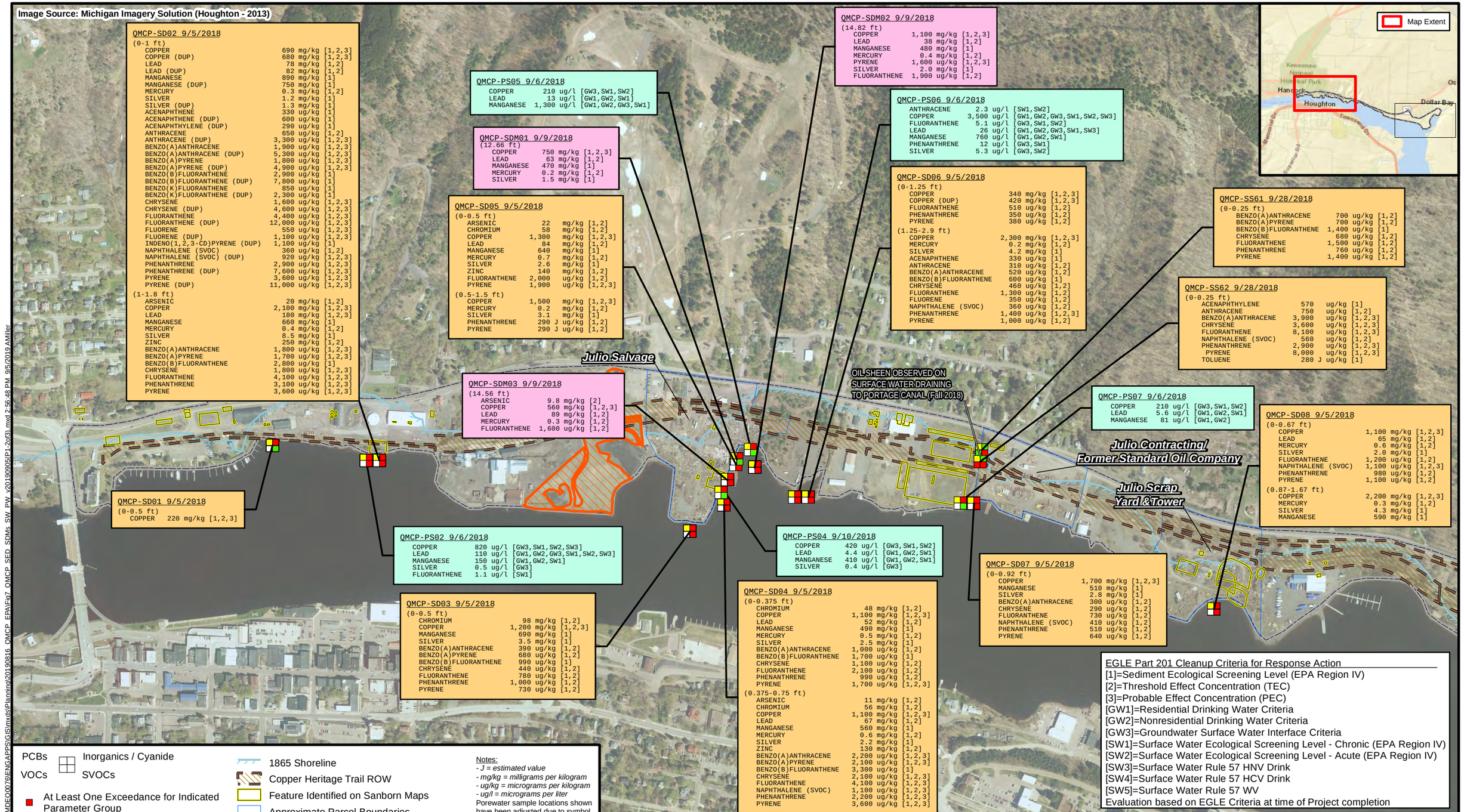

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Figure 7-a

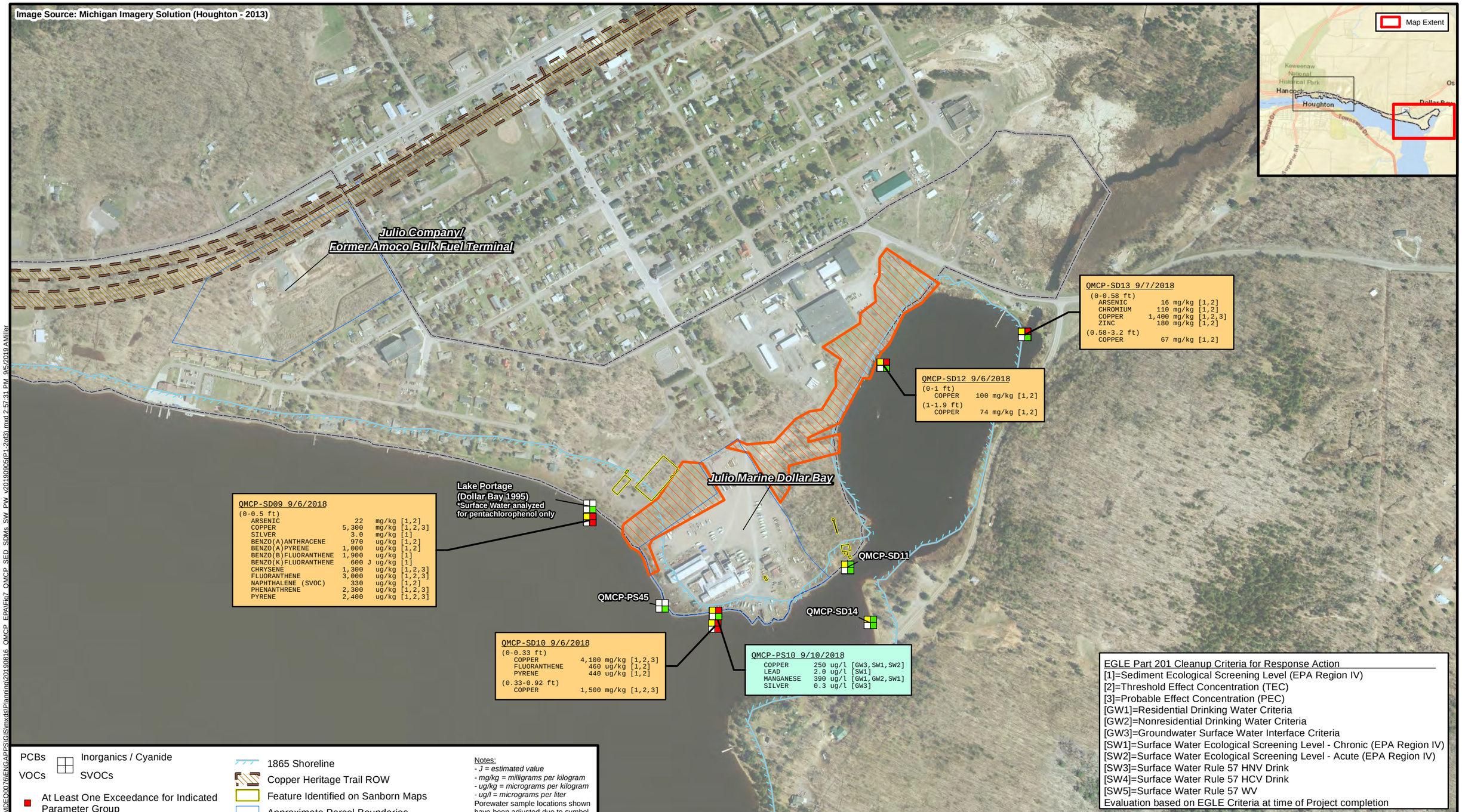
DRAFT

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects_K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:56:48 PM 9/5/2019 AMiller



PCBs
VOCs
Inorganics / Cyanide
SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

- 1865 Shoreline
- Copper Heritage Trail ROW
- Feature Identified on Sanborn Maps
- Approximate Parcel Boundaries
- EPA Cap Boundary
- QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *ug/kg = micrograms per kilogram*
- *ug/l = micrograms per liter*

Porewater sample locations shown have been adjusted due to symbol size

N

0 550 Ft

Coordinate System: MIGeoRef(m)

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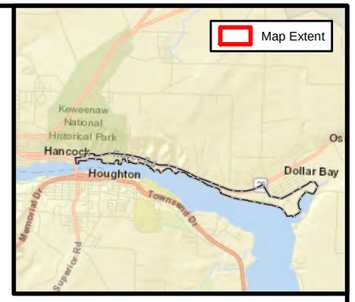
Figure 7-b ***DRAFT***

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:57:31 PM 9/5/2019 AMiller



AREA	Year	Historical Operations
Julio Salvage	1907, 1917, 1928, 1949	Portage Lake Foundry & Machinery
Julio Contracting/ Former Standard Oil Company	1917	Standard Oil Company Other historic land use and/or operations unknown.
Julio Scrap Yard and Tower	1907 1917, 1928 1949	Portage Boiler Works Lake Superior Iron and Metal Co. Scrap Iron Storage, J.H. Green Co. (Scrap Iron Yard)
Julio Company/ Former Amoco Bulk Fuel Terminal		Bulk Oil Storage Other historic land use and/or operations unknown.
Julio Marine Dollar Bay	1907 1917, 1928 1949	Tamarack & Osceola Copper Manufacturing Co. John A Roebling's Sons Copper Manufacturing Foley Copper Products Co. Copper Wire Mill

Notes:
- Historic opeations based on Sanborn Map review

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Figure 7-c
DRAFT
Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater - Notes
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_OMCP_EPA\Fig7_OMCP_SED_SDMs_SW_PW_v20190905(P3of3).mxd 2:50:24 PM, 9/5/2019 AMiller

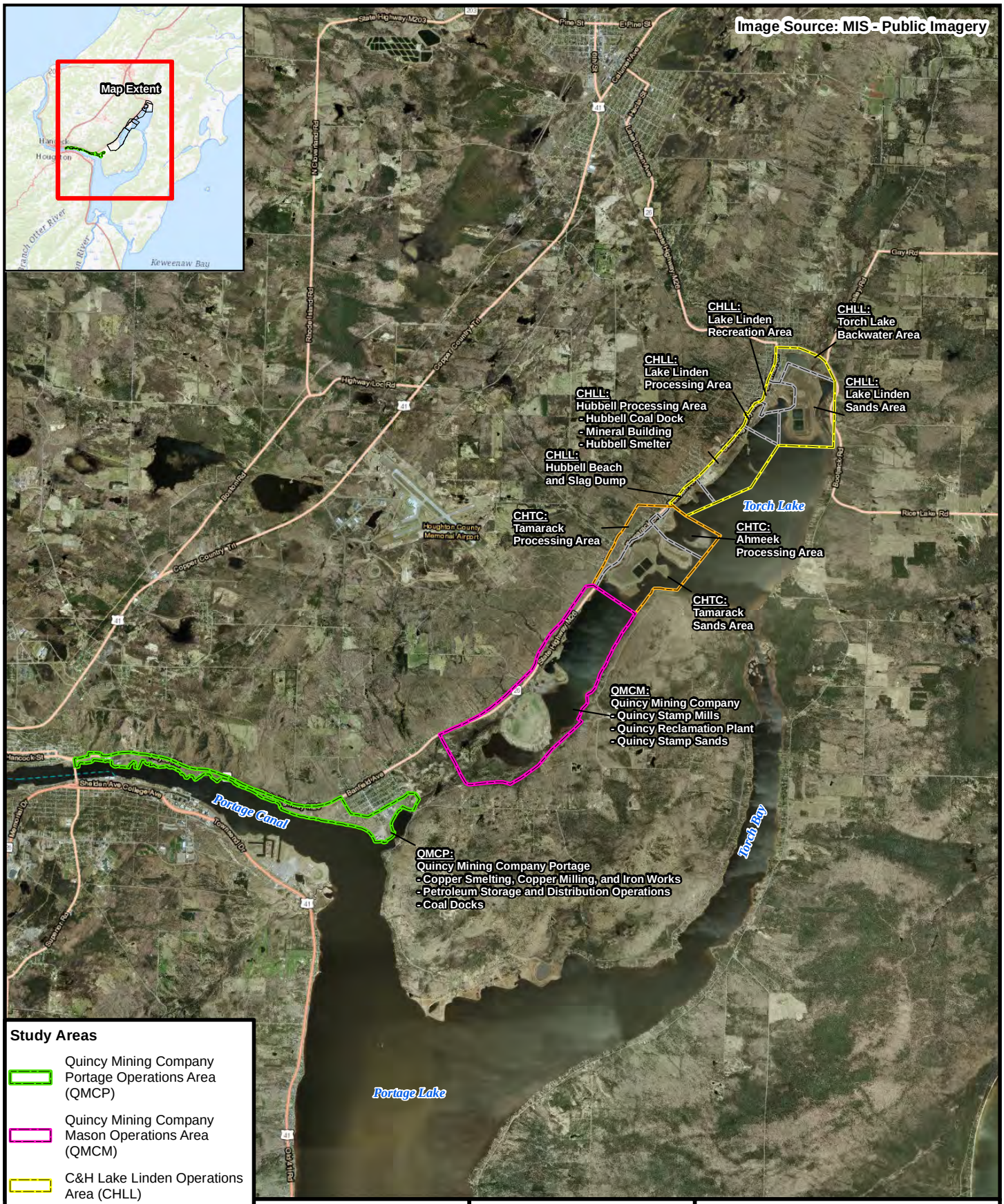

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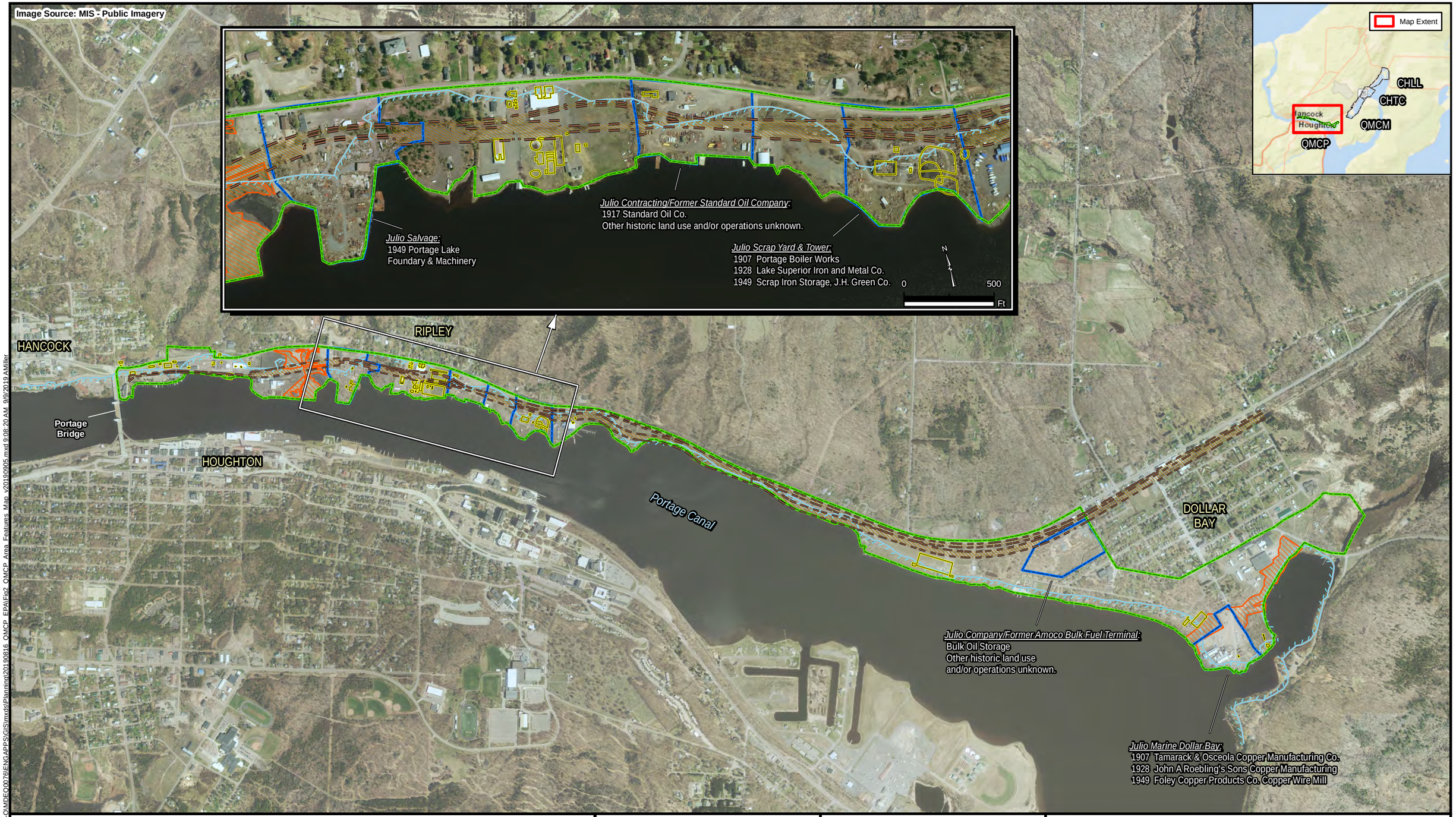
Figure 1

Project Location Map
Houghton County,
Michigan

FILE: W:\Projects\Projects K-O\MDEQ076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPAFig1_QMCP_Project_Location_v20190827.mxd 5:00:19 PM 8/27/2019 AMiller



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Copper Heritage Trail ROW

1865 Shoreline

QMCP Study Area Boundary

Approximate Parcel Boundaries

Features Identified on Sanborn Maps

EPA Cap Boundary

Notes:
Historic land use and/or operations refer to noted years on available Sanborn Maps.

N

0 1,500 Ft

Coordinate System: MIGeoRef(m)

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Figure 2
Area Features Map
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

DATA SOURCES

Sample IDs	Date Range
1) **QMCP-ASBBLK...**	**September 2018**

-EGLE RRD. *SI results not published.*

- 1917 Standard Oil Co.
- Other historic land use and/or operations unknown

Sample with Asbestos Greater than 1%

Sample with Asbestos Not Detected

1865 Shoreline

Copper Heritage Trail ROW

Feature Identified on Sanborn Maps

Approximate Parcel Boundaries

QMCP Study Area Boundary

N

0 100 Ft

Coordinate System: MIGeoRef(m)

Notes:
- Underlying imagery from Michigan Imagery Solution (Houghton - 2013)

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Figure 3 **DRAFT**

Sample Analytical Result Map - Suspect Asbestos Containing Material
Julio Contracting/Former Standard Oil Company
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig3_QMCP_ASBBLK_v20190905.mxd 8:39:21 AM 9/9/2019 AMiller

-1917 Standard Oil Company
- Other historic land use and/or operations unknown

DATA SOURCES

Sample IDs	Date Range
1) **Julio**	**1995**

-MDEQ Environmental Lab Report.

Julio Contracting/Former Standard Oil Company
1-25 gallon containers: 8
35-40 gallon containers: 9
55 gallon drums: 43
Fuel Tanks: 2
AST/USTs: 6
Pressurized Vessels/Compressed Cylinder: 1

EPA Regional Removal Management Levels
[RML]=Industrial Soil (May 2019)
EGLE 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
[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
Volatilization to Indoor Air Interm Action Screening Levels (Aug 2017)
[19]=Soil Non-Residential RIASL (Interim Aug 2017)
Title 40 CFR, Chapter 1, Section 261.20-24
[20]=Hazardous Waste Toxicity Screening Values
* Exceedances of criteria 2 and 11 shown for organics and cyanide only
Evaluation based on EGLE Criteria at time of Project completion

Waste Sample with Results Less than Criteria
Approximate Compressed Cylinder Observation (#) = Number of cylinders in general area
1865 Shoreline
Copper Heritage Trail ROW
Feature Identified on Sanborn Maps
Approximate Parcel Boundaries
QMCP Study Area Boundary
Updated Aerial Imagery Extent (26 June 2019)

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *mg/l = milligrams per liter*
- *ug/kg = micrograms per kilogram*
- RPM = Residual Process Material
- TCLP = Toxicity Characteristic Leaching Procedure
- Underlying Imagery from Michigan Imagery Solution (Houghton - 2013)

N
0 100 Ft
Coordinate System: MIGeoRef(m)

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Figure 4
DRAFT
Sample Analytical Result Map - Residual Process Material, Abandoned Container, and Waste - Julio Contracting/Former Standard Oil Company
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPAIFin4_QMCP_RPM_AC_Waste_v20190905(P1-3of4).mxd 8:57:30 AM, 9/9/2019 AMiller

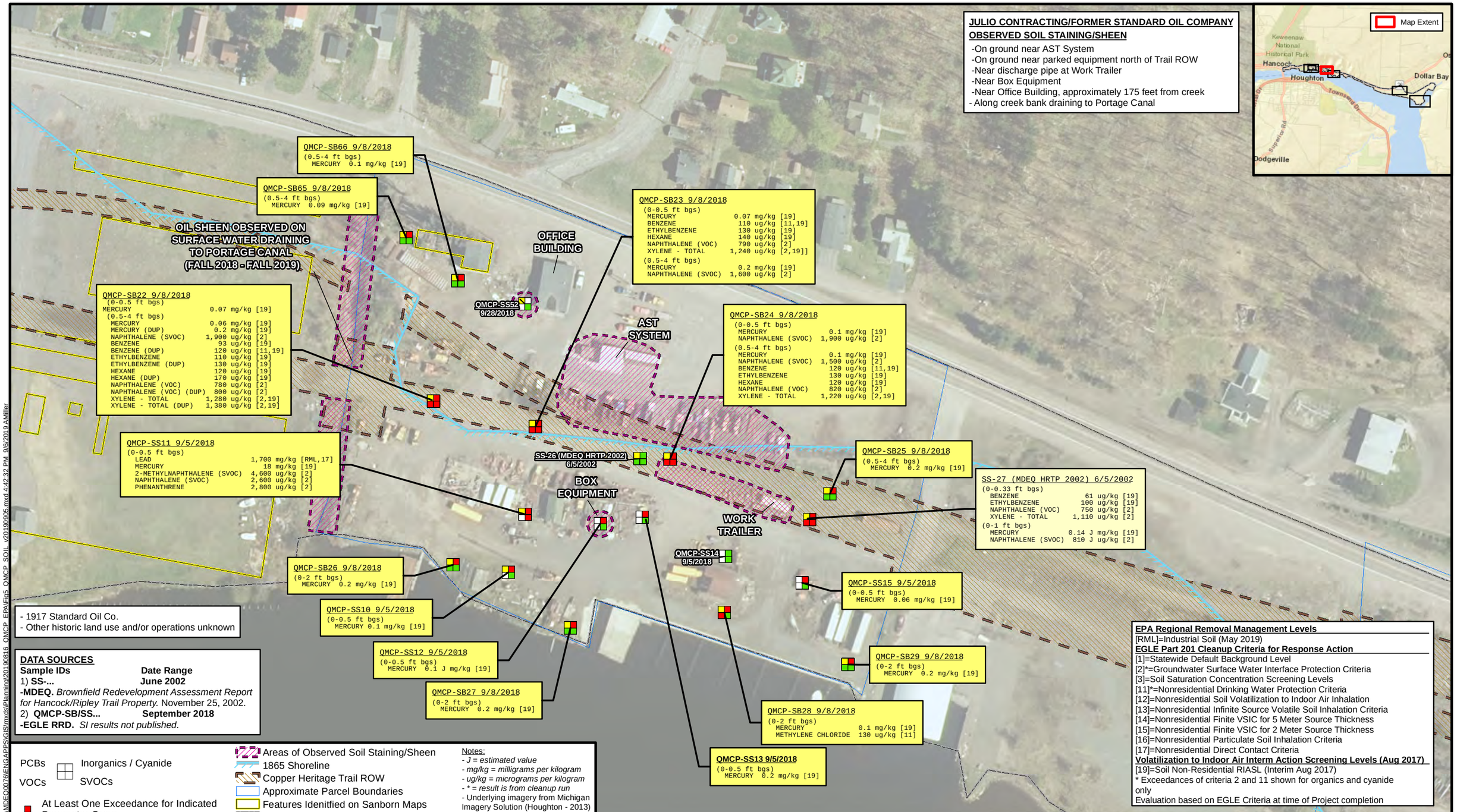

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Figure 5

DRAFT

Sample Analytical Result Map - Soil
Julio Contracting/Former Standard Oil Company
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects_K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_ERA\Fig5_QMCP_SOIL_v20190905.mxd 4:42:32 PM 9/6/2019 AMiller

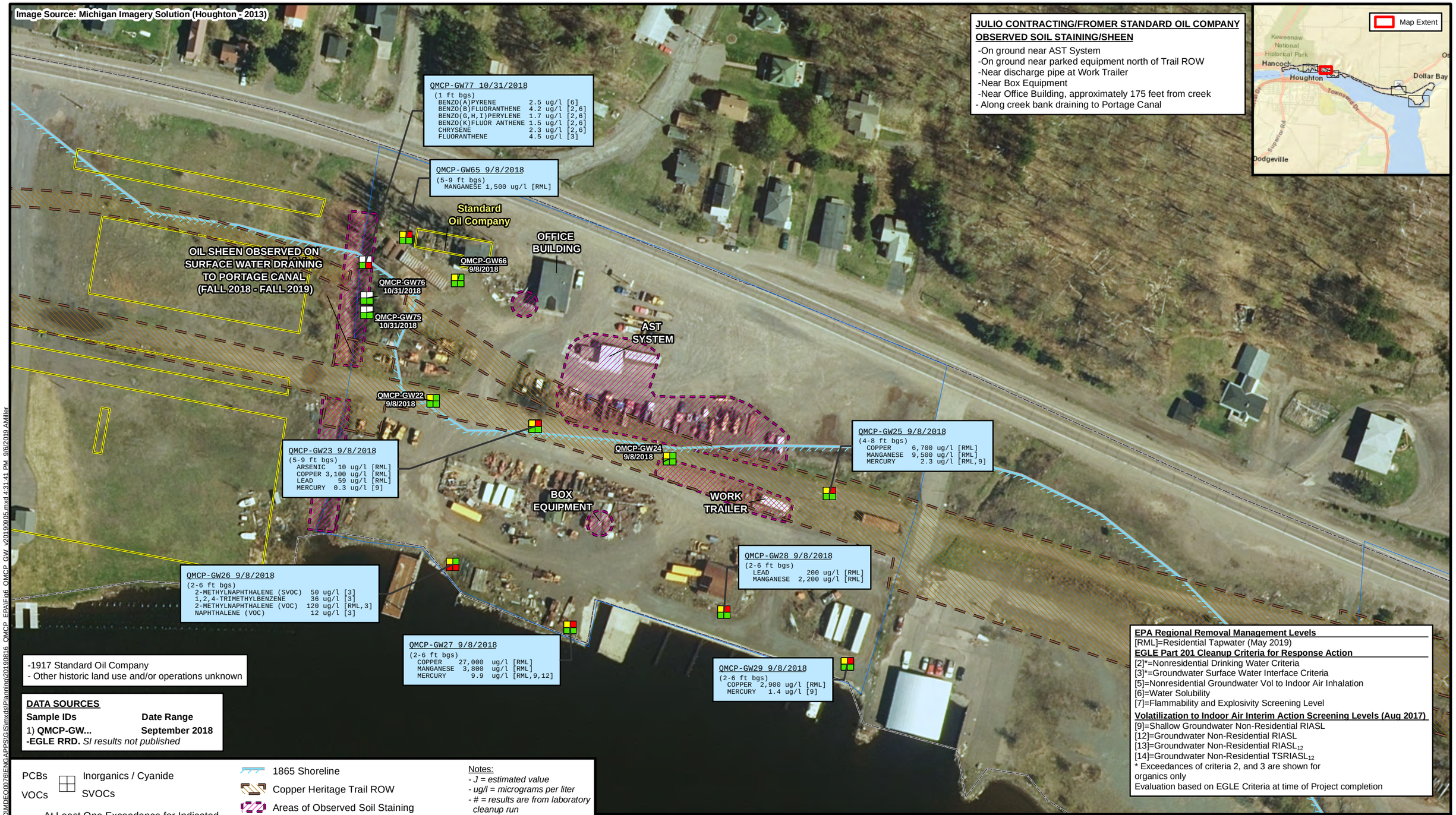

Figure 6
Sample Analytical Results Map - Groundwater
Julio Contracting/Former Standard Oil Company
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

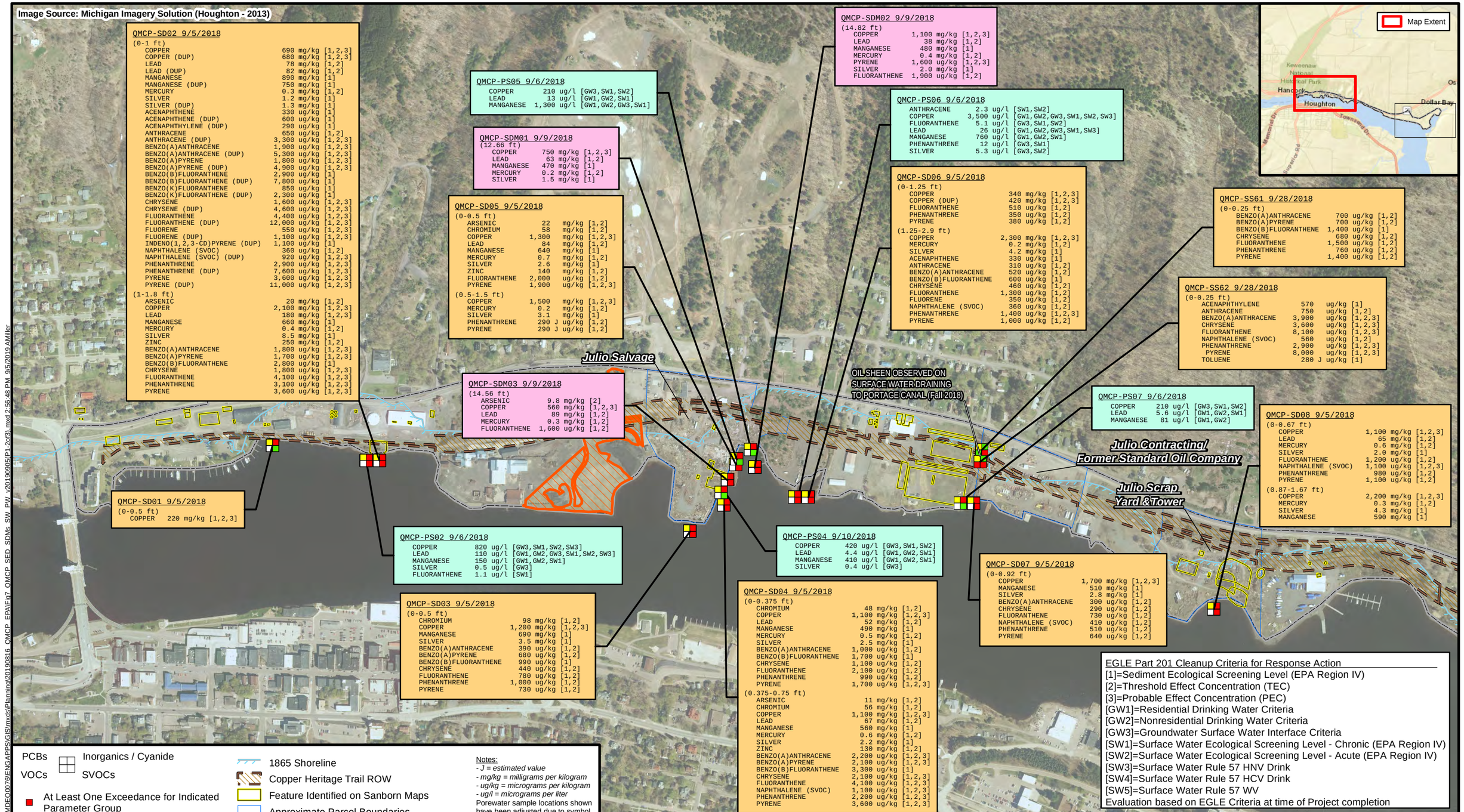

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Figure 7-a

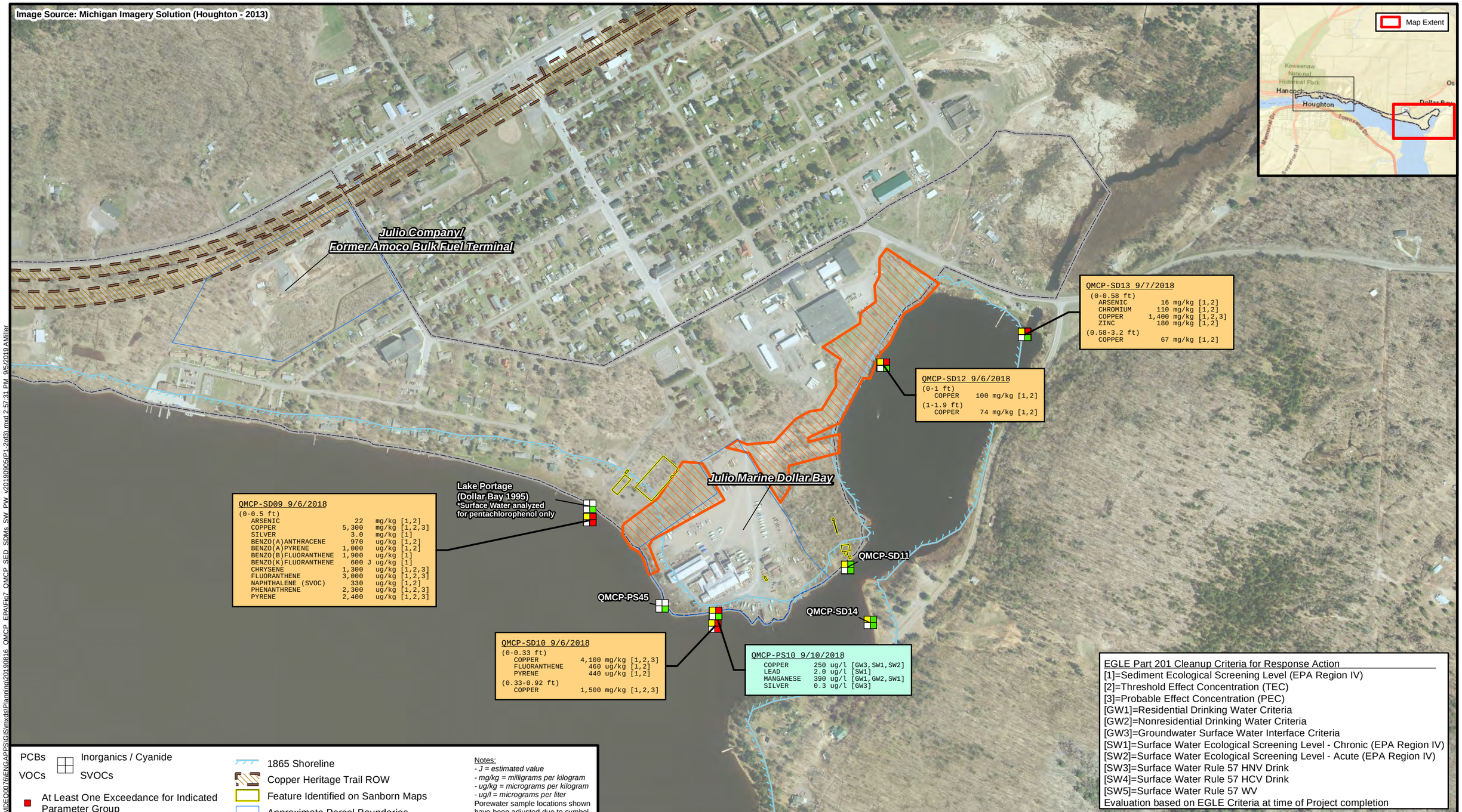
DRAFT

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects_K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:56:48 PM 9/5/2019 AMiller



PCBs
VOCs
Inorganics / Cyanide
SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

- 1865 Shoreline
- Copper Heritage Trail ROW
- Feature Identified on Sanborn Maps
- Approximate Parcel Boundaries
- EPA Cap Boundary
- QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *ug/kg = micrograms per kilogram*
- *ug/l = micrograms per liter*

Porewater sample locations shown have been adjusted due to symbol size

N

0 550 Ft

Coordinate System: MIGeoRef(m)

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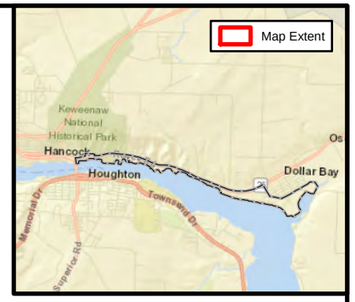
Figure 7-b ***DRAFT***

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:57:31 PM 9/5/2019 AMiller



AREA	Year	Historical Operations
Julio Salvage	1907, 1917, 1928, 1949	Portage Lake Foundry & Machinery
Julio Contracting/ Former Standard Oil Company	1917	Standard Oil Company Other historic land use and/or operations unknown.
Julio Scrap Yard and Tower	1907 1917, 1928 1949	Portage Boiler Works Lake Superior Iron and Metal Co. Scrap Iron Storage, J.H. Green Co. (Scrap Iron Yard)
Julio Company/ Former Amoco Bulk Fuel Terminal		Bulk Oil Storage Other historic land use and/or operations unknown.
Julio Marine Dollar Bay	1907 1917, 1928 1949	Tamarack & Osceola Copper Manufacturing Co. John A Roebling's Sons Copper Manufacturing Foley Copper Products Co. Copper Wire Mill

Notes:
- Historic opeations based on Sanborn Map review

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Figure 7-c
DRAFT
Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater - Notes
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_OMCP_EPA\Fig7_OMCP_SED_SDMs_SW_PW_v20190905(P3of3).mxd 2:50:24 PM, 9/5/2019 AMiller

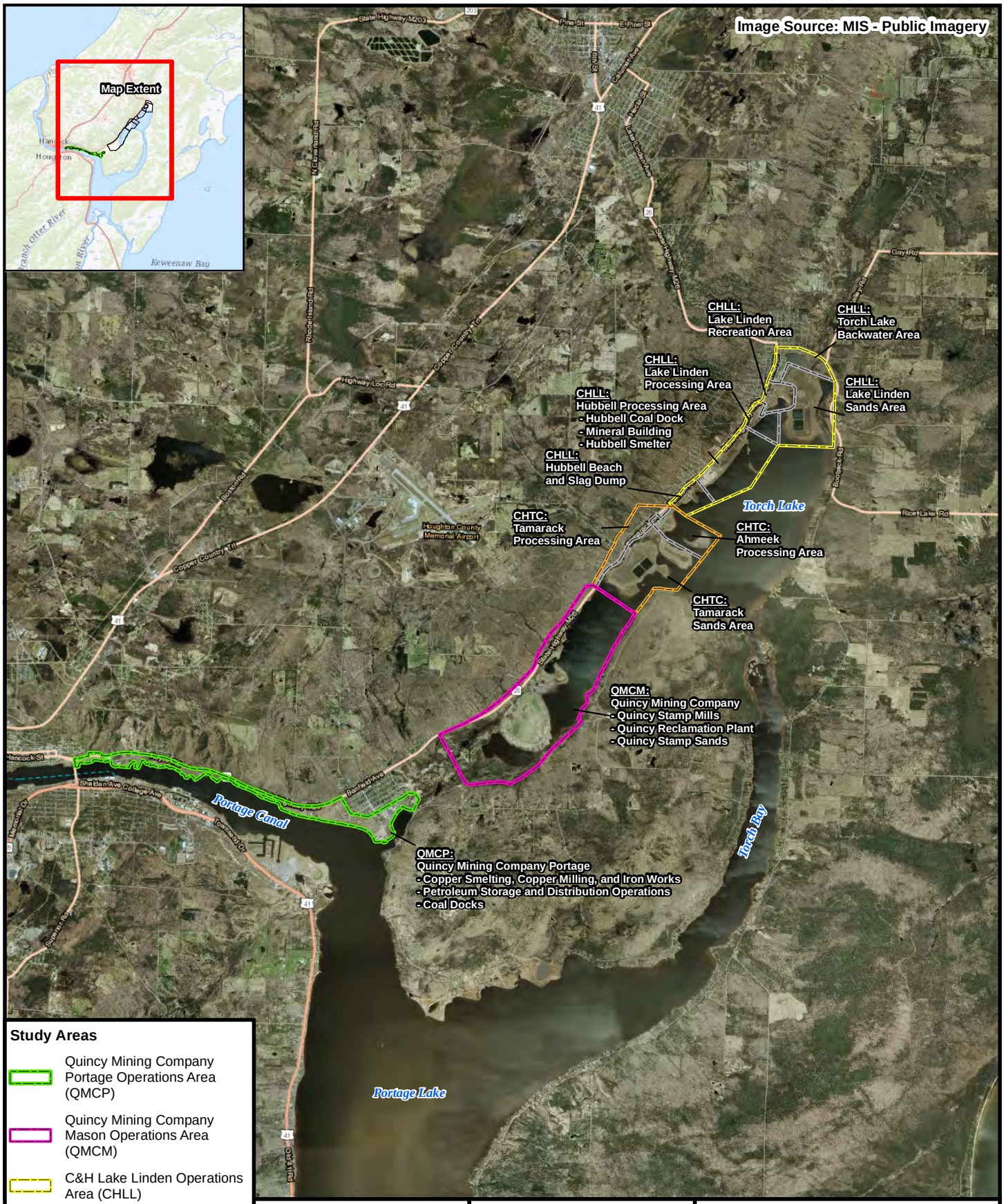

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Figure 1

Project Location Map
Houghton County,
Michigan

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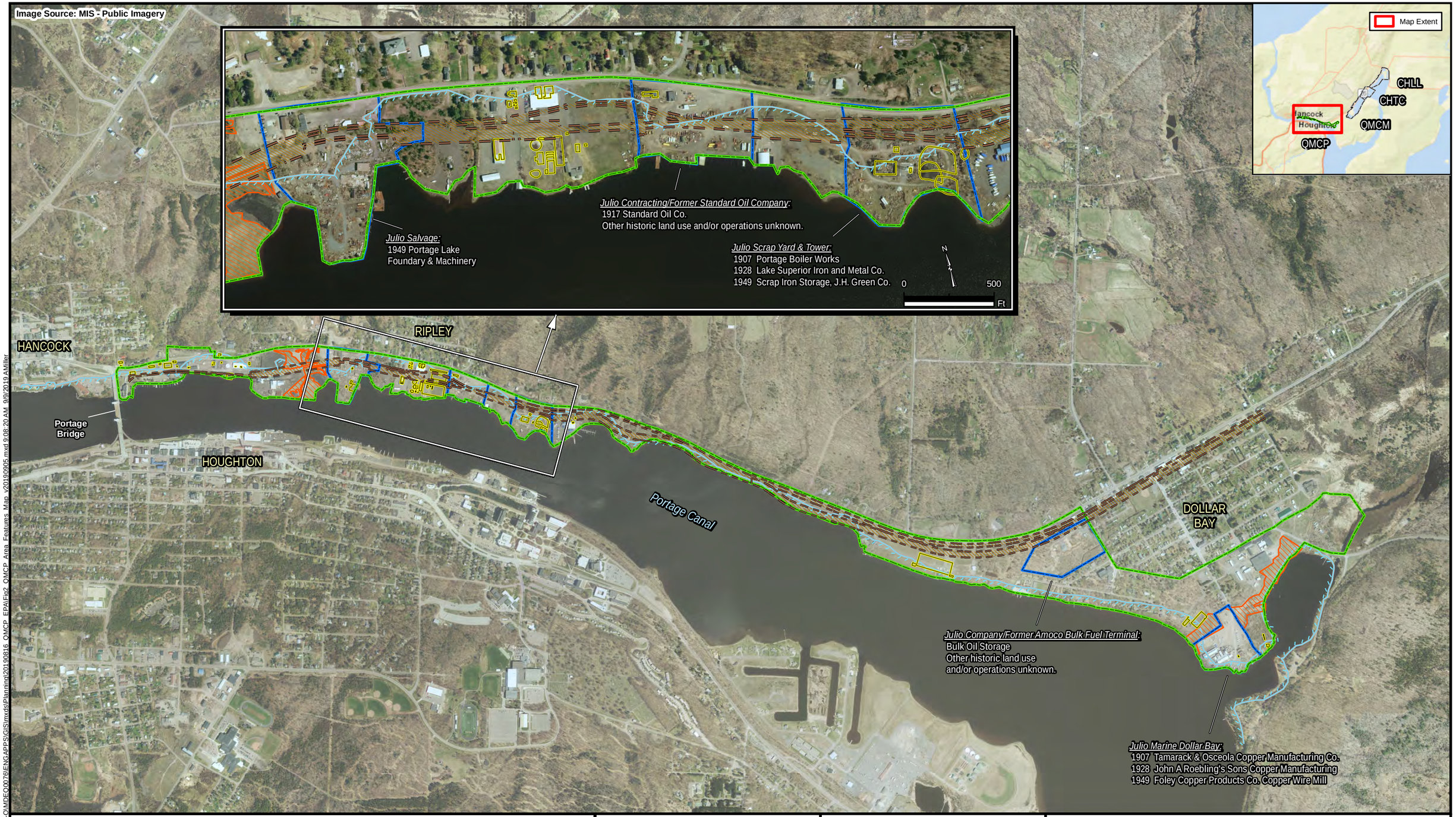

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Copper Heritage Trail ROW

1865 Shoreline

QMCP Study Area Boundary

Approximate Parcel Boundaries

Features Identified on Sanborn Maps

EPA Cap Boundary

Notes:
Historic land use and/or operations refer to noted years on available Sanborn Maps.

N

0 1,500 Ft

Coordinate System: MIGeoRef(m)

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Figure 2
Area Features Map
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

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Figure 3 *DRAFT*

Sample Analytical Result Map - Suspect Asbestos Containing Material
Julio Salvage (Pre-2019)
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

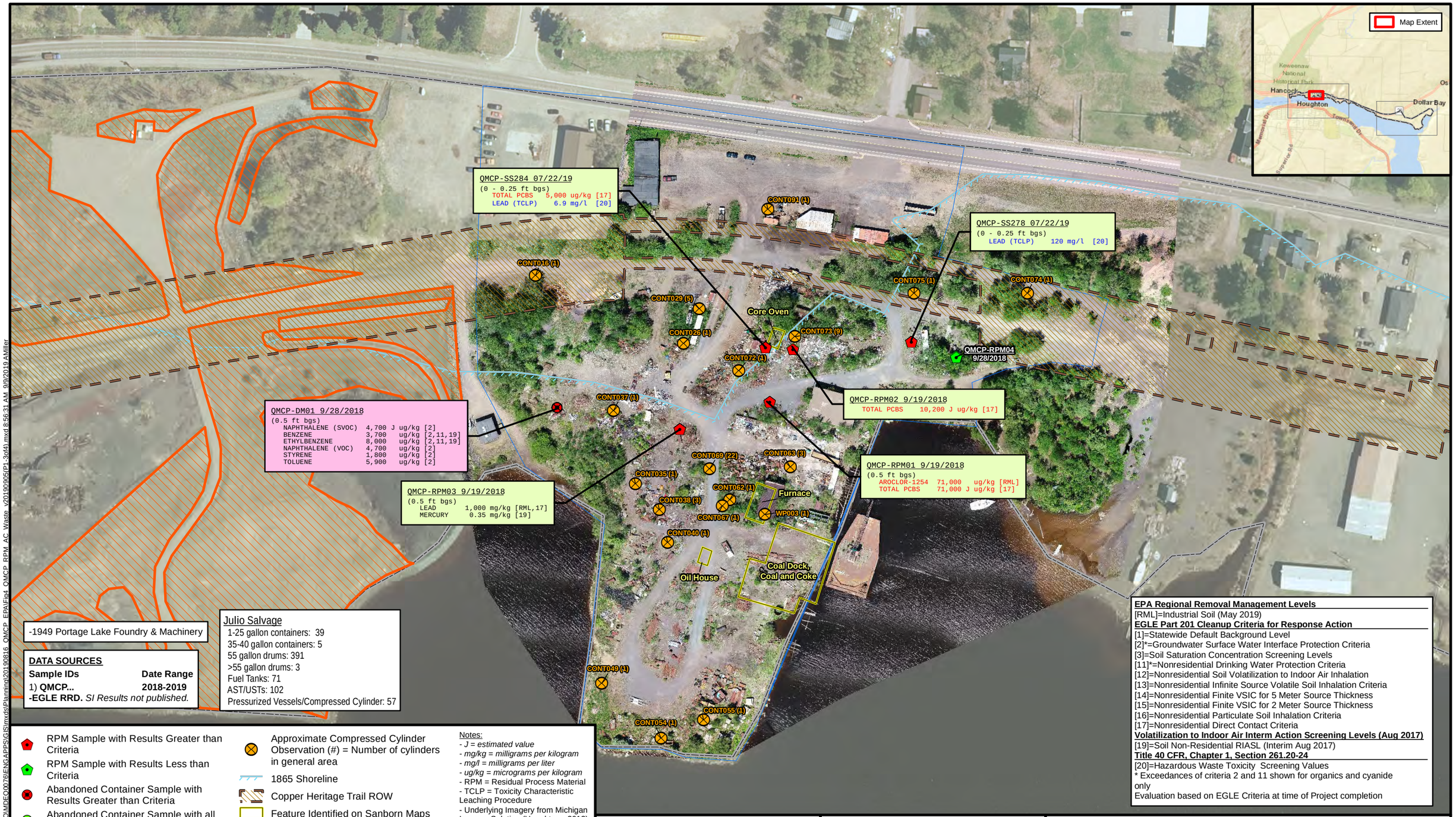

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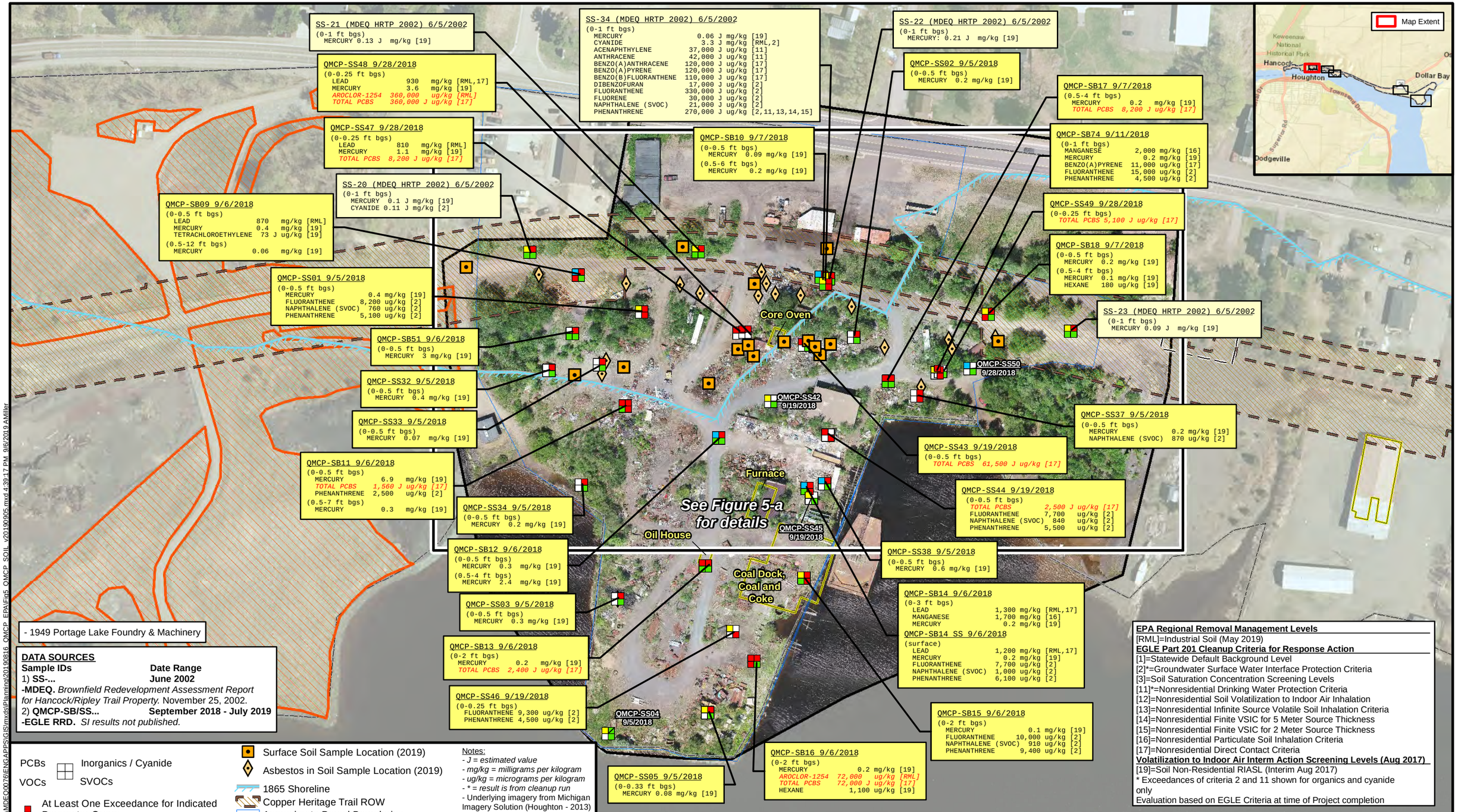
Figure 4

DRAFT

Sample Analytical Result Map - Residual Process Material, Abandoned Container, and Waste - Julio Salvage
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan



DATA SOURCES

Sample IDs	Date Range
1) **SS-...**	**June 2002**
-MDEQ. *Brownfield Redevelopment Assessment Report for Hancock/Ripley Trail Property.* November 25, 2002.	
2) **QMCP-SB/SS...**	**September 2018 - July 2019**
-EGLE RRD. *SI results not published.*	

EPA Regional Removal Management Levels
[RML]=Industrial Soil (May 2019)
EGLE 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
[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
Volatilization to Indoor Air Interm Action Screening Levels (Aug 2017)
[19]=Soil Non-Residential RIASL (Interim Aug 2017)
* Exceedances of criteria 2 and 11 shown for organics and cyanide only
Evaluation based on EGLE Criteria at time of Project completion

PCBs — Inorganics / Cyanide
VOCs — SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

- Surface Soil Sample Location (2019)
- Asbestos in Soil Sample Location (2019)
- 1865 Shoreline
- Copper Heritage Trail ROW
- Approximate Parcel Boundaries
- EPA Cap Boundary
- Features Idenitfied on Sanborn Maps
- QMCP Study Area Boundary
- Updated Aerial Imagery Extent (26 June 2019)

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *ug/kg = micrograms per kilogram*
- ** = result is from cleanup run*
- Underlying imagery from Michigan Imagery Solution (Houghton - 2013)

N
0 125 Ft
Coordinate System: MIGeoRef(m)

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Figure 5 *DRAFT*

Sample Analytical Result Map - Soil
Julio Salvage (Pre-2019)
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPAFig5_QMCP_SOIL_v20190905.mxd 4:39:17 PM, 9/6/2019 AMiller

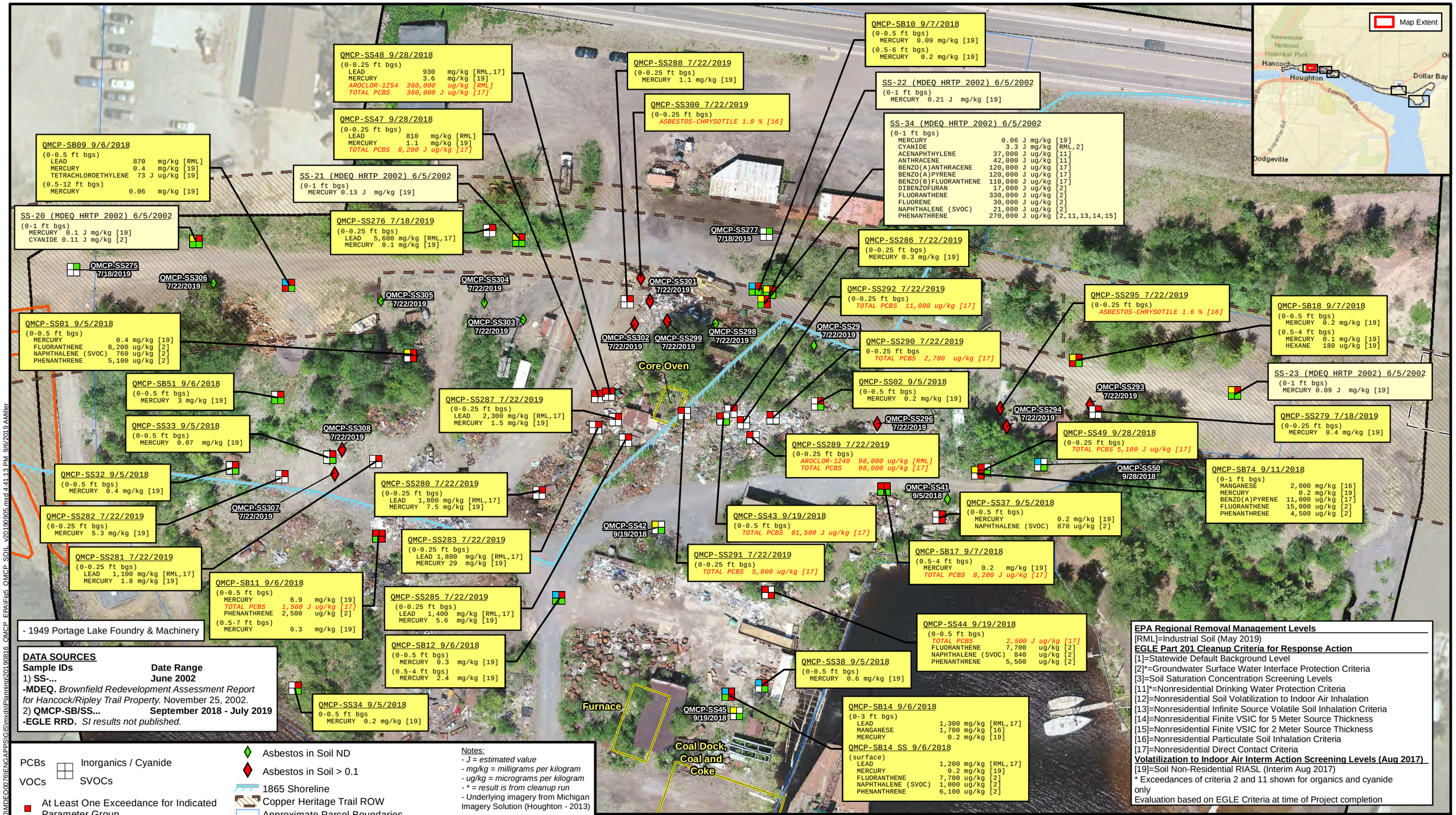

Figure 5-a DRAFT

Sample Analytical Result Map - Soil
Julio Salvage (ROW and Adjacent)
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

Figure 6
Sample Analytical Results Map - Groundwater
Julio Salvage
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENG\APPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig6_QMCP_GW_v20190905.mxd 4:30:52 PM 9/6/2019 AMiller

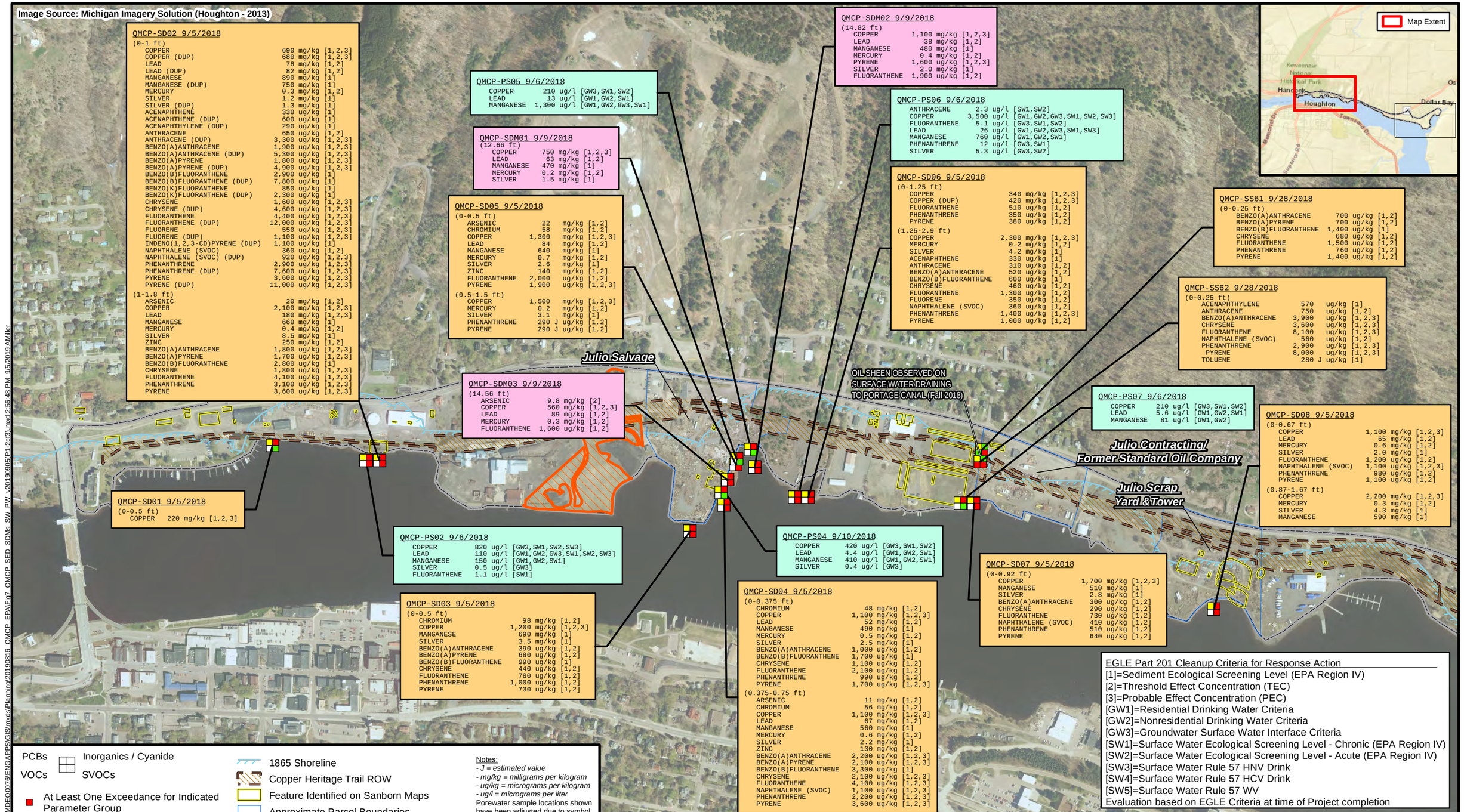

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Figure 7-a

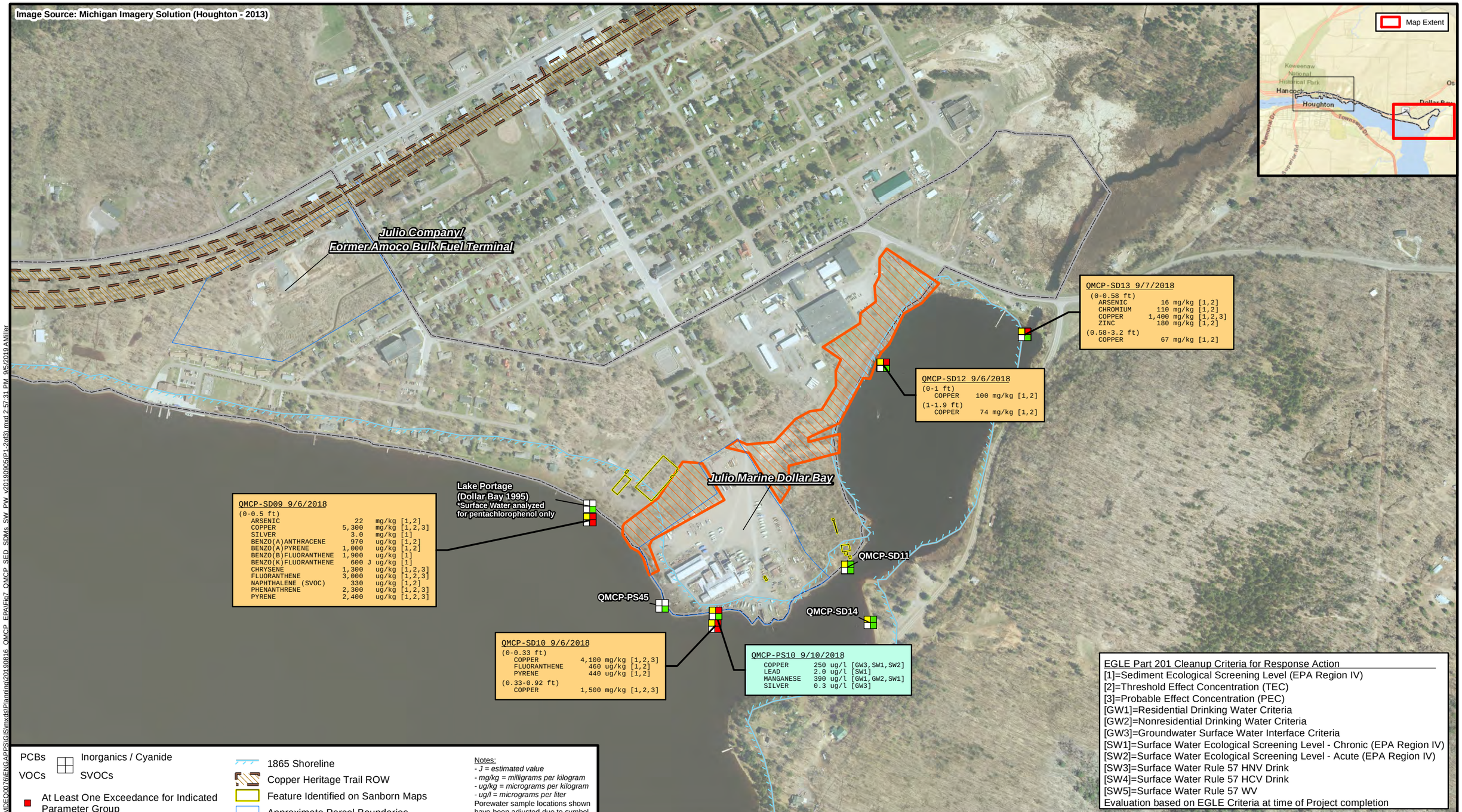
DRAFT

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects_K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:56:48 PM 9/5/2019 AMiller



PCBs
VOCs
Inorganics / Cyanide
SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

- 1865 Shoreline
- Copper Heritage Trail ROW
- Feature Identified on Sanborn Maps
- Approximate Parcel Boundaries
- EPA Cap Boundary
- QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *ug/kg = micrograms per kilogram*
- *ug/l = micrograms per liter*

Porewater sample locations shown have been adjusted due to symbol size

N

0 550 Ft

Coordinate System: MIGeoRef(m)

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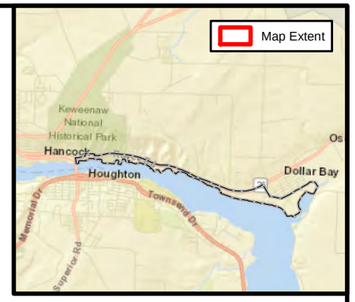
Figure 7-b ***DRAFT***

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:57:31 PM 9/5/2019 AMiller



AREA	Year	Historical Operations
Julio Salvage	1907, 1917, 1928, 1949	Portage Lake Foundry & Machinery
Julio Contracting/ Former Standard Oil Company	1917	Standard Oil Company Other historic land use and/or operations unknown.
Julio Scrap Yard and Tower	1907 1917, 1928 1949	Portage Boiler Works Lake Superior Iron and Metal Co. Scrap Iron Storage, J.H. Green Co. (Scrap Iron Yard)
Julio Company/ Former Amoco Bulk Fuel Terminal		Bulk Oil Storage Other historic land use and/or operations unknown.
Julio Marine Dollar Bay	1907 1917, 1928 1949	Tamarack & Osceola Copper Manufacturing Co. John A Roebling's Sons Copper Manufacturing Foley Copper Products Co. Copper Wire Mill

Notes:
- Historic opeations based on Sanborn Map review

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Figure 7-c
DRAFT
Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater - Notes
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_OMCP_EPA\Fig7_OMCP_SED_SDMs_SW_PW_v20190905(P3of3).mxd 2:50:24 PM, 9/5/2019 AMiller

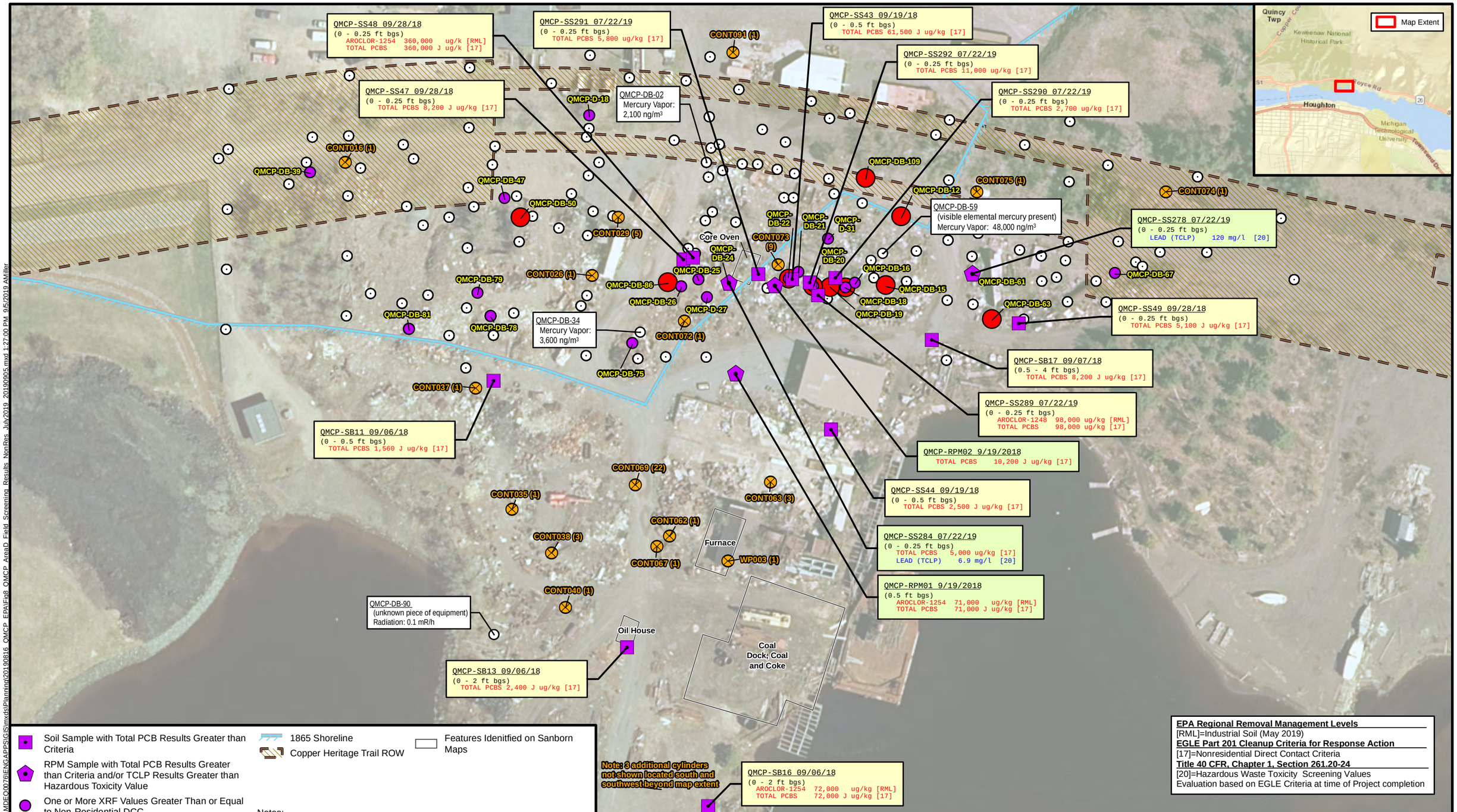

Figure 8

Julio Salvage - Field Screening, Observations, PCB and TCLP Results
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

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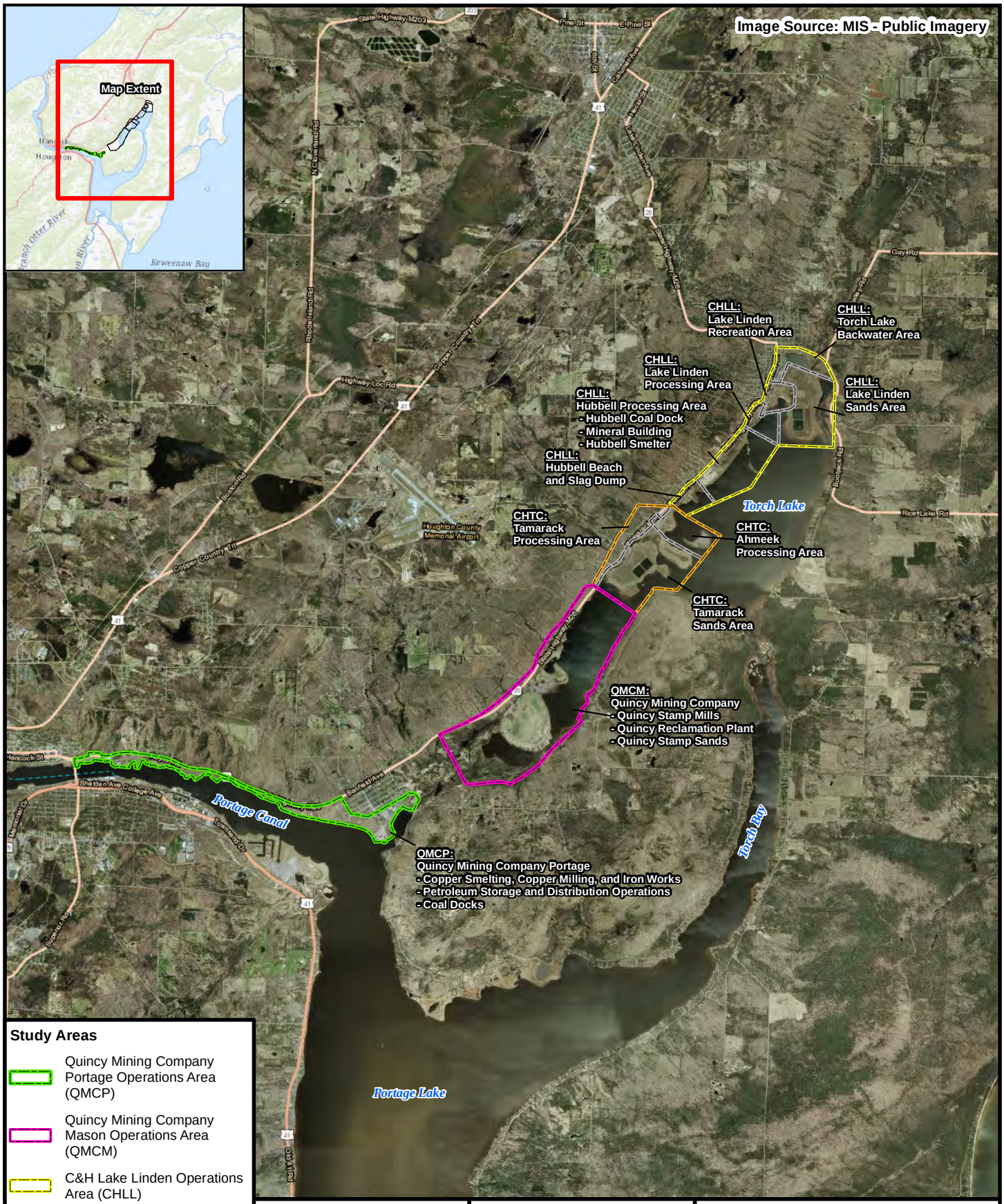

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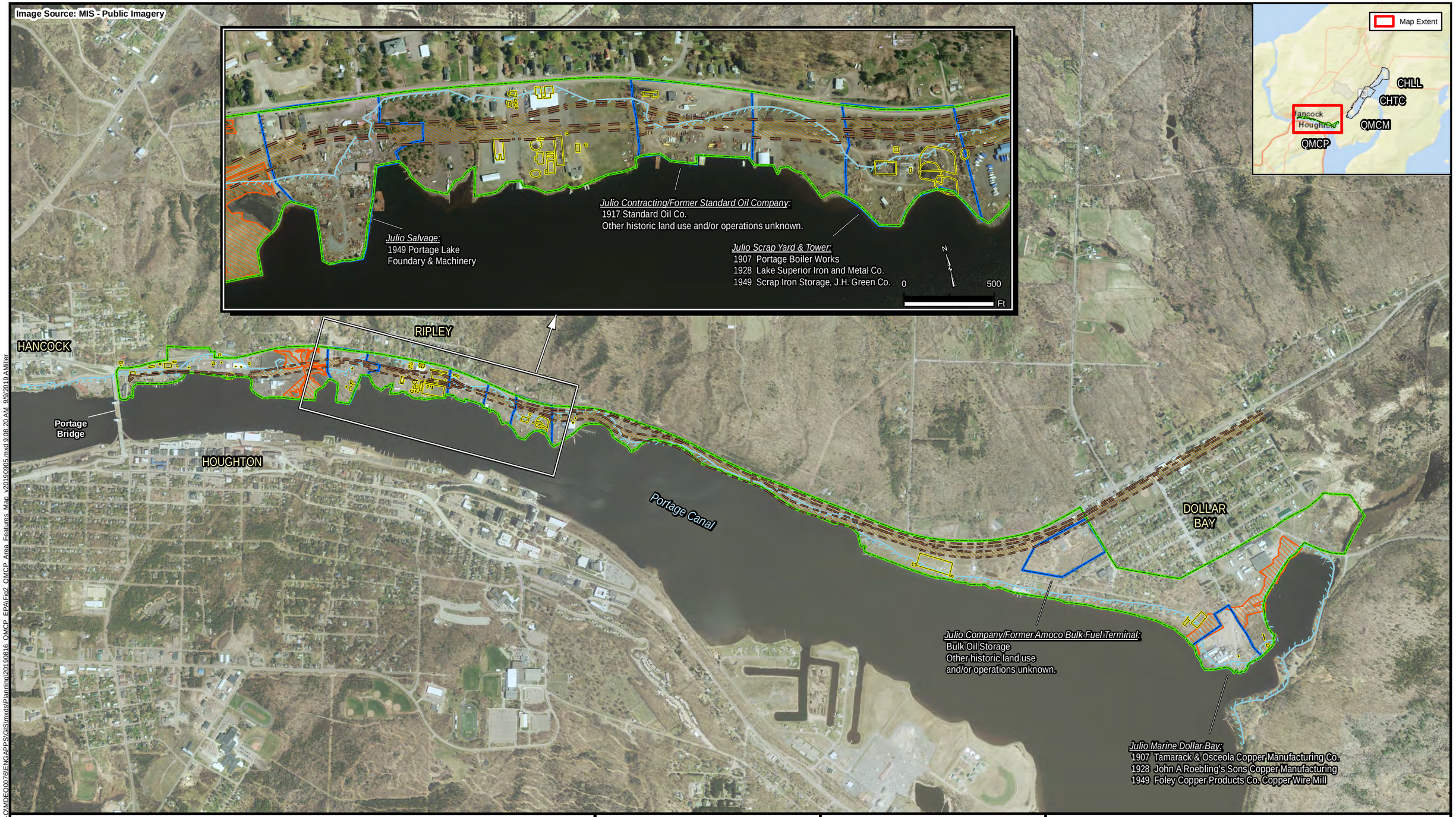
Figure 1

Project Location Map
Houghton County,
Michigan

FILE: W:\Projects\Projects K-O\MDEQ076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPAFig1_QMCP_Project_Location_v20190827.mxd 5:00:19 PM 8/27/2019 AMiller



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Copper Heritage Trail ROW

1865 Shoreline

QMCP Study Area Boundary

Approximate Parcel Boundaries

Features Identified on Sanborn Maps

EPA Cap Boundary

Notes:
Historic land use and/or operations refer to noted years on available Sanborn Maps.

N

0 1,500 Ft

Coordinate System: MIGeoRef(m)

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Figure 2
Area Features Map
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

DATA SOURCES

Sample IDs	Date Range
1) **QMCP-ASBBLK...**	**September 2018**

-EGLE RRD. *SI results not published.*

- 1907 Portage Boiler Works
- 1928 Lake Superior Iron and Metal Co.
- 1949 A & Scrap Iron Storage, J.H. Green Co.

Sample with Asbestos Greater than 1%

Sample with Asbestos Not Detected

1865 Shoreline

Copper Heritage Trail ROW

Feature Identified on Sanborn Maps

Approximate Parcel Boundaries

QMCP Study Area Boundary

N

0 100 Ft

Coordinate System: MIGeoRef(m)

Notes:
- Underlying imagery from Michigan Imagery Solution (Houghton - 2013)

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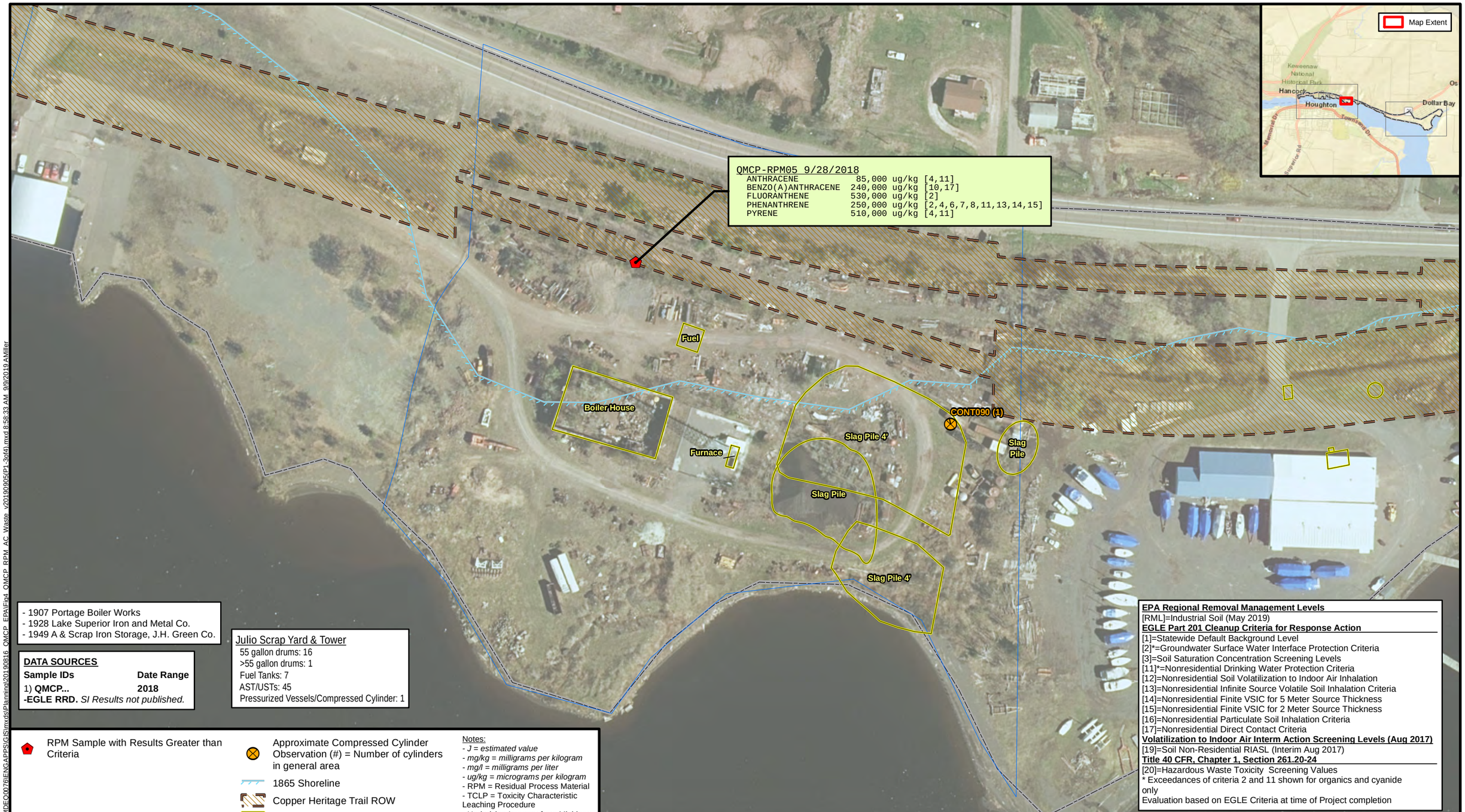
Figure 3 **DRAFT**

Sample Analytical Result Map - Suspect Asbestos Containing Material
Julio Scrap Yard & Tower
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig3_QMCP_ASBBLK_v20190905.mxd 8:40:16 AM 9/9/2019 AMiller



- 1907 Portage Boiler Works
- 1928 Lake Superior Iron and Metal Co.
- 1949 A & Scrap Iron Storage, J.H. Green Co.

DATA SOURCES

Sample IDs	Date Range
1) **QMCP...**	**2018**

-EGLE RRD. *SI Results not published.*

Julio Scrap Yard & Tower
55 gallon drums: 16
>55 gallon drums: 1
Fuel Tanks: 7
AST/USTs: 45
Pressurized Vessels/Compressed Cylinder: 1

EPA Regional Removal Management Levels
[RML]=Industrial Soil (May 2019)
EGLE 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
[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
Volatilization to Indoor Air Interm Action Screening Levels (Aug 2017)
[19]=Soil Non-Residential RIASL (Interim Aug 2017)
Title 40 CFR, Chapter 1, Section 261.20-24
[20]=Hazardous Waste Toxicity Screening Values
* Exceedances of criteria 2 and 11 shown for organics and cyanide only
Evaluation based on EGLE Criteria at time of Project completion

RPM Sample with Results Greater than Criteria

Approximate Compressed Cylinder Observation (#) = Number of cylinders in general area

1865 Shoreline

Copper Heritage Trail ROW

Feature Identified on Sanborn Maps

Approximate Parcel Boundaries

QMCP Study Area Boundary

Updated Aerial Imagery Extent (26 June 2019)

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *mg/l = milligrams per liter*
- *ug/kg = micrograms per kilogram*
- RPM = Residual Process Material
- TCLP = Toxicity Characteristic Leaching Procedure
- Underlying Imagery from Michigan Imagery Solution (Houghton - 2013)

N

0 100 Ft

Coordinate System: MIGeoRef(m)

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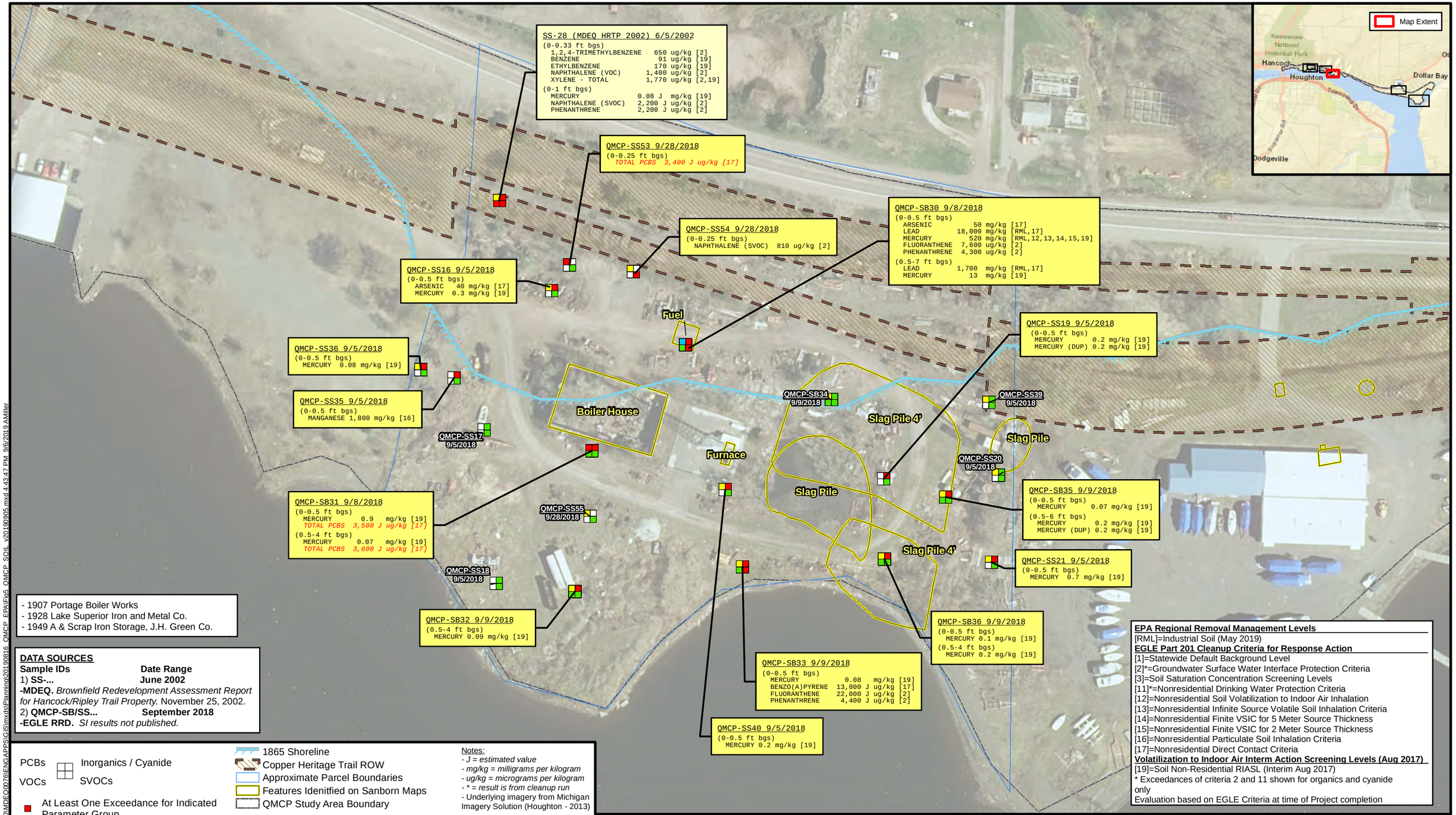
Figure 4

DRAFT

Sample Analytical Result Map - Residual Process Material, Abandoned Container, and Waste - Julio Scrap Yard & Tower
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects_K-O\MDEQ0076\ENG\APPS\GIS\mxds\Planning\20190816_QMCP_EPAFig4_QMCP_RPM_AC_Waste_v20190905(P1_3of4).mxd 8:58:33 AM 9/9/2019 AMiller



- 1907 Portage Boiler Works
- 1928 Lake Superior Iron and Metal Co.
- 1949 A & Scrap Iron Storage, J.H. Green Co.

DATA SOURCES

Sample IDs	Date Range
1) **SS-...**	**June 2002**

-MDEQ. *Brownfield Redevelopment Assessment Report for Hancock/Ripley Trail Property.* November 25, 2002.

2) **QMCP-SB/SS...** **September 2018**

-EGLE RRD. *SI results not published.*

PCBs
VOCs
Inorganics / Cyanide
SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

- 1865 Shoreline
- Copper Heritage Trail ROW
- Approximate Parcel Boundaries
- Features Idenitfied on Sanborn Maps
- QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *ug/kg = micrograms per kilogram*
- ** = result is from cleanup run*
- Underlying imagery from Michigan Imagery Solution (Houghton - 2013)

N

0 100 Ft

Coordinate System: MIGeoRef(m)

EPA Regional Removal Management Levels
[RML]=Industrial Soil (May 2019)
EGLE 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
[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
Volatilization to Indoor Air Interm Action Screening Levels (Aug 2017)
[19]=Soil Non-Residential RIASL (Interim Aug 2017)
* Exceedances of criteria 2 and 11 shown for organics and cyanide only
Evaluation based on EGLE Criteria at time of Project completion

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Figure 5 *DRAFT*

Sample Analytical Result Map - Soil
Julio Scrap Yard & Tower
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

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- 1907 Portage Boiler Works
- 1928 Lake Superior Iron and Metal Co.
- 1949 A & Scrap Iron Storage, J.H. Green Co.

DATA SOURCES

Sample IDs	Date Range
1) **QMCP-GW...**	**September 2018**

-EGLE RRD. *SI results not published*

EPA Regional Removal Management Levels
[RML]=Residential Tapwater (May 2019)
EGLE Part 201 Cleanup Criteria for Response Action
[2]*=Nonresidential Drinking Water Criteria
[3]*=Groundwater Surface Water Interface Criteria
[5]=Nonresidential Groundwater Vol to Indoor Air Inhalation
[6]=Water Solubility
[7]=Flammability and Explosivity Screening Level
Volatilization to Indoor Air Interim Action Screening Levels (Aug 2017)
[9]=Shallow Groundwater Non-Residential RIASL
[12]=Groundwater Non-Residential RIASL
[13]=Groundwater Non-Residential $RIASL_{12}$
[14]=Groundwater Non-Residential $TSRIASL_{12}$
* Exceedances of criteria 2, and 3 are shown for organics only
Evaluation based on EGLE Criteria at time of Project completion

PCBs
VOCs
Inorganics / Cyanide
SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

- 1865 Shoreline
- Copper Heritage Trail ROW
- Features Identified on Sanborn Maps
- Approximate Parcel Boundaries
- QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *ug/l = micrograms per liter*
- *# = results are from laboratory cleanup run*

N
0 100 Ft
Coordinate System: MIGeoRef(m)

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DRAFT

Figure 6
Sample Analytical Results Map - Groundwater
Julio Scrap Yard & Tower
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig6_QMCP_GW_v20190905.mxd 4:32:43 PM 9/6/2019 AMiller

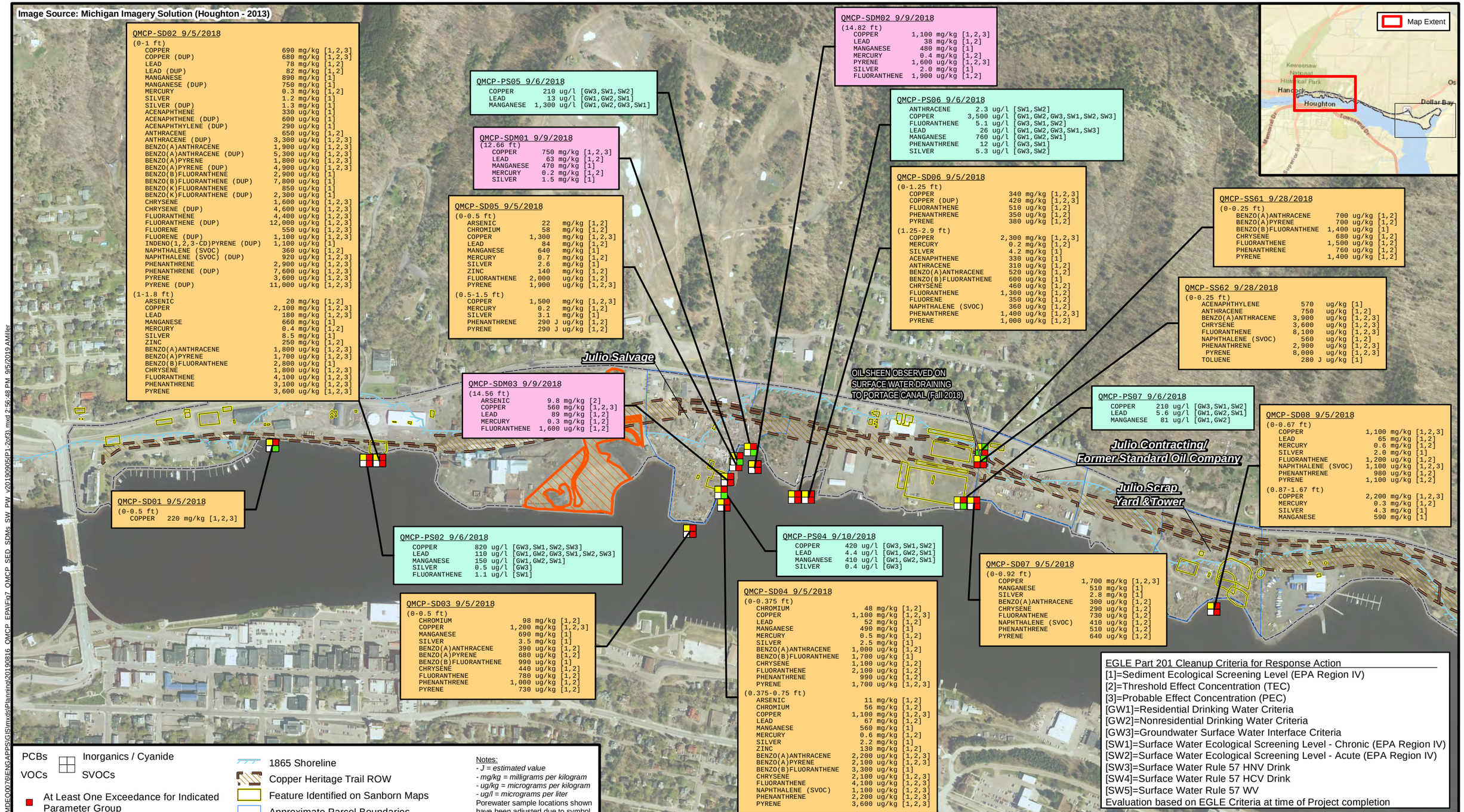

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Figure 7-a

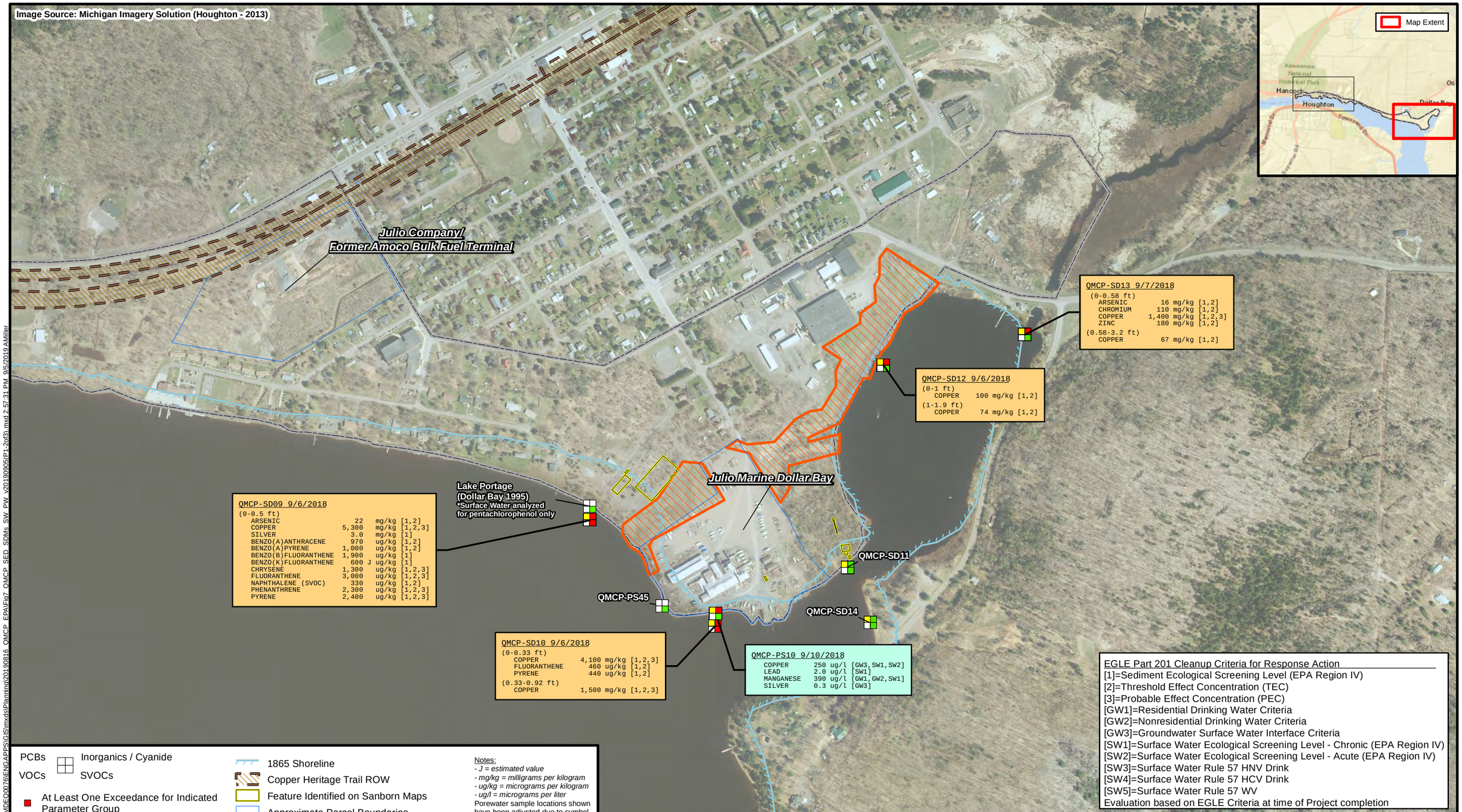
DRAFT

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects_K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:56:48 PM 9/5/2019 AMiller



PCBs
VOCs
Inorganics / Cyanide
SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

- 1865 Shoreline
- Copper Heritage Trail ROW
- Feature Identified on Sanborn Maps
- Approximate Parcel Boundaries
- EPA Cap Boundary
- QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *ug/kg = micrograms per kilogram*
- *ug/l = micrograms per liter*

Porewater sample locations shown have been adjusted due to symbol size

N

0 550 Ft

Coordinate System: MIGeoRef(m)

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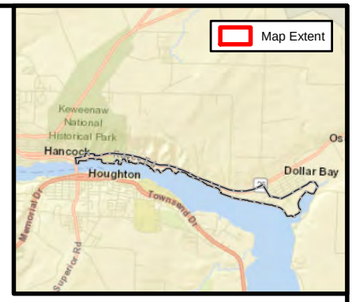
Figure 7-b ***DRAFT***

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:57:31 PM 9/5/2019 AMiller



AREA	Year	Historical Operations
Julio Salvage	1907, 1917, 1928, 1949	Portage Lake Foundry & Machinery
Julio Contracting/ Former Standard Oil Company	1917	Standard Oil Company Other historic land use and/or operations unknown.
Julio Scrap Yard and Tower	1907 1917, 1928 1949	Portage Boiler Works Lake Superior Iron and Metal Co. Scrap Iron Storage, J.H. Green Co. (Scrap Iron Yard)
Julio Company/ Former Amoco Bulk Fuel Terminal		Bulk Oil Storage Other historic land use and/or operations unknown.
Julio Marine Dollar Bay	1907 1917, 1928 1949	Tamarack & Osceola Copper Manufacturing Co. John A Roebling's Sons Copper Manufacturing Foley Copper Products Co. Copper Wire Mill

Notes:
- Historic opeations based on Sanborn Map review

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Figure 7-c
DRAFT
Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater - Notes
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_OMCP_EPA\Fig7_OMCP_SED_SDMs_SW_PW_v20190905(P3of3).mxd 2:50:24 PM, 9/5/2019 AMiller

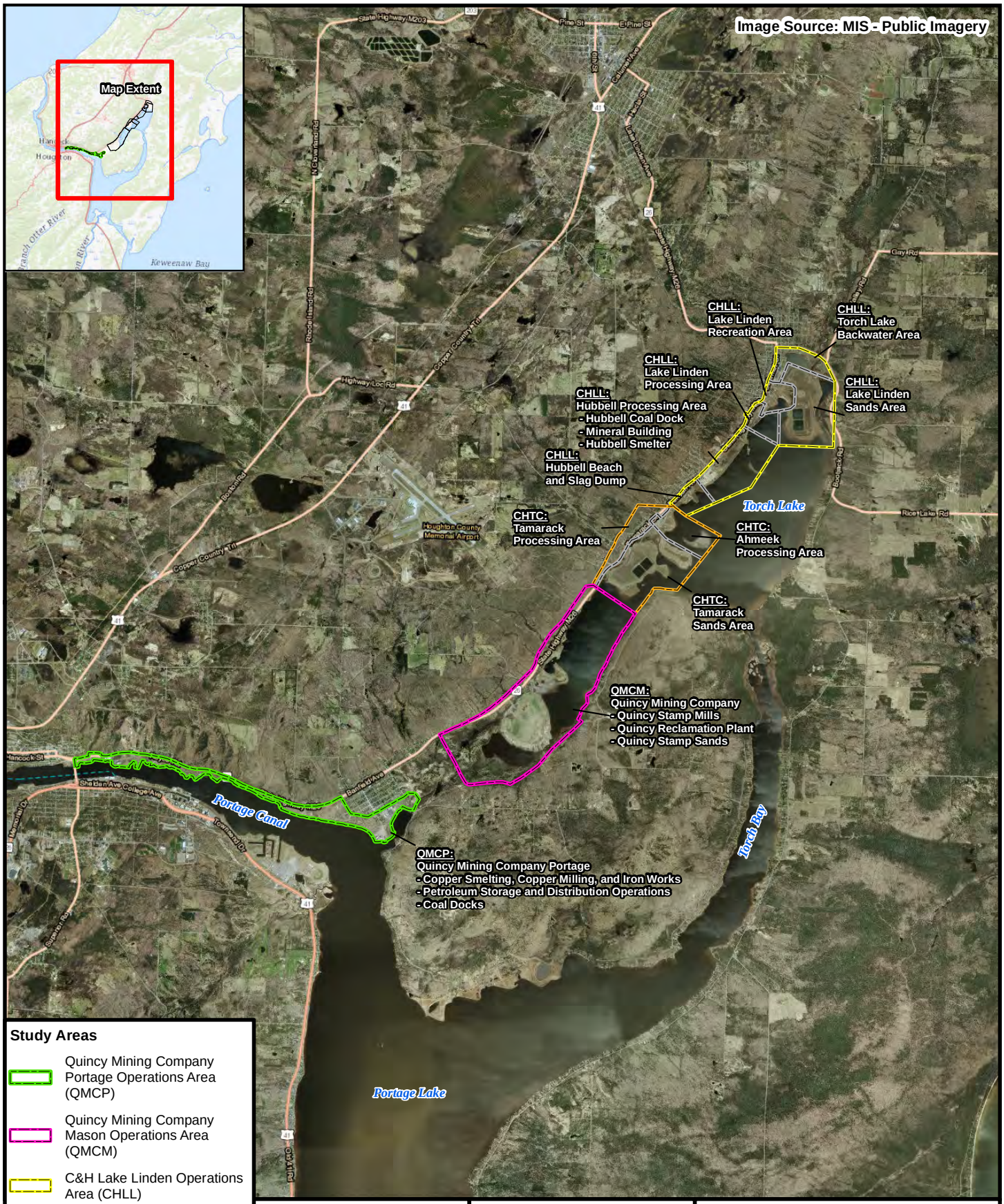

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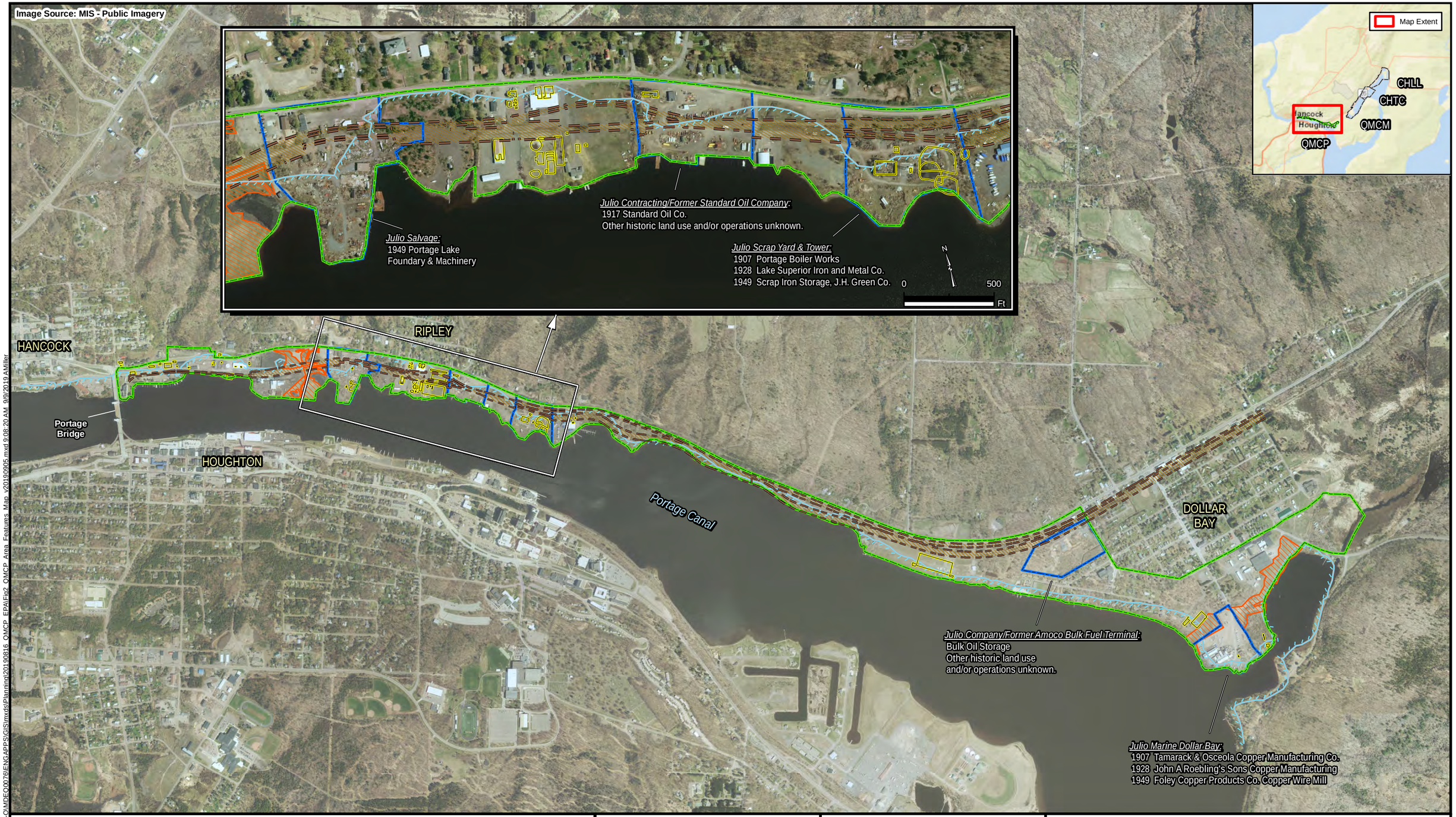
Figure 1

Project Location Map
Houghton County,
Michigan

FILE: W:\Projects\Projects K-O\MDEQ076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPAFig1_QMCP_Project_Location_v20190827.mxd 5:00:19 PM 8/27/2019 AMiller



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Copper Heritage Trail ROW

1865 Shoreline

QMCP Study Area Boundary

Approximate Parcel Boundaries

Features Identified on Sanborn Maps

EPA Cap Boundary

Notes:
Historic land use and/or operations refer to noted years on available Sanborn Maps.

N

0 1,500 Ft

Coordinate System: MIGeoRef(m)

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Figure 2
Area Features Map
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

DATA SOURCES

Sample IDs	Date Range
1) **QMCP-ASBBLK... -EGLE RRD.** *SI results not published.*	**September 2018**

- 1907 Tamarack & Osceola Copper Manufacturing Co.
- 1928 John A Roebling's Sons Copper Manufacturing
- 1949 Foley Copper Products Co. Copper Wire Mill

Sample with Asbestos Greater than 1%

Sample with Asbestos Not Detected

1865 Shoreline

Feature Identified on Sanborn Maps

Approximate Parcel Boundaries

EPA Cap Boundary

QMCP Study Area Boundary

N

0 175 Ft

Coordinate System: MIGeoRef(m)

Notes:
- Underlying imagery from Michigan Imagery Solution (Houghton - 2013)

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Figure 3 **DRAFT**

Sample Analytical Result Map - Suspect Asbestos Containing Material
Julio Marine Dollar Bay
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig3_QMCP_ASBBLK_v20190905.mxd 8:41:53 AM 9/9/2019 AMiller

- 1907 Tamarack & Osceola Copper Manufacturing Co.
- 1928 John A Roebling's Sons Copper Manufacturing
- 1949 Foley Copper Products Co. Copper Wire Mill

Julio Marine Dollar Bay
1-25 gallon containers: 4
35-40 gallon containers: 3
55 gallon drums: 115
Fuel Tanks: 7
AST/USTs: 41
Pressurized Vessels/Compressed Cylinder: 5

EPA Regional Removal Management Levels
[RML]=Industrial Soil (May 2019)
EGLE 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
[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
Volatilization to Indoor Air Interm Action Screening Levels (Aug 2017)
[19]=Soil Non-Residential RIASL (Interim Aug 2017)
Title 40 CFR, Chapter 1, Section 261.20-24
[20]=Hazardous Waste Toxicity Screening Values
* Exceedances of criteria 2 and 11 shown for organics and cyanide only
Evaluation based on EGLE Criteria at time of Project completion

Approximate Compressed Cylinder Observation (#) = Number of cylinders in general area
1865 Shoreline
Copper Heritage Trail ROW
Feature Identified on Sanborn Maps
Approximate Parcel Boundaries
EPA Cap Boundary
QMCP Study Area Boundary

Notes:
- No Samples Collected
- Underlying Imagery from Michigan Imagery Solution (Houghton - 2013)

N
0 175 Ft
Coordinate System: MIGeoRef(m)

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Figure 4
DRAFT
Sample Analytical Result Map - Residual Process Material, Abandoned Container, and Waste - Julio Marine Dollar Bay
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPAFig4_QMCP_RPM_AC_Waste_v20190905(P1-3of4).mxd 9:00:17 AM, 9/9/2019 AMiller

Figure 5

Sample Analytical Result Map - Soil
Julio Marine Dollar Bay
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENG\APPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig5_QMCP_SOIL_v20190905.mxd 4:46:30 PM 9/6/2019 AMiller

- 1907 Tamarack & Osceola Copper Manufacturing Co.
- 1928 John A Roebling's Sons Copper Manufacturing
- 1949 Foley Copper Products Co. Copper Wire Mill

DATA SOURCES

Sample IDs	Date Range
1) **QMCP-GW...**	**September 2018**

-EGLE RRD. *SI results not published*

EPA Regional Removal Management Levels
[RML]=Residential Tapwater (May 2019)
EGLE Part 201 Cleanup Criteria for Response Action
[2]*=Nonresidential Drinking Water Criteria
[3]*=Groundwater Surface Water Interface Criteria
[5]=Nonresidential Groundwater Vol to Indoor Air Inhalation
[6]=Water Solubility
[7]=Flammability and Explosivity Screening Level
Volatilization to Indoor Air Interim Action Screening Levels (Aug 2017)
[9]=Shallow Groundwater Non-Residential RIASL
[12]=Groundwater Non-Residential RIASL
[13]=Groundwater Non-Residential $RIASL_{12}$
[14]=Groundwater Non-Residential $TSRIASL_{12}$
* Exceedances of criteria 2, and 3 are shown for organics only
Evaluation based on EGLE Criteria at time of Project completion

PCBs
VOCs
Inorganics / Cyanide
SVOCs
At Least One Exceedance for Indicated Parameter Group
No Exceedances for Indicated Parameter Group
At Least One Detection of PCBs
PCBs Not Detected
Indicated Parameter Group Not Analyzed
Free Product Observed
1865 Shoreline
Features Identified on Sanborn Maps
Approximate Parcel Boundaries
EPA Cap Boundary
QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *ug/l = micrograms per liter*
- *# = results are from laboratory cleanup run*

N
0 180 Ft
Coordinate System: MIGeoRef(m)

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Figure 6
Sample Analytical Results Map - Groundwater
Julio Marine Dollar Bay
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENG\APPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig6_QMCP_GW_v20190905.mxd 4:34:27 PM, 9/6/2019 AMiller

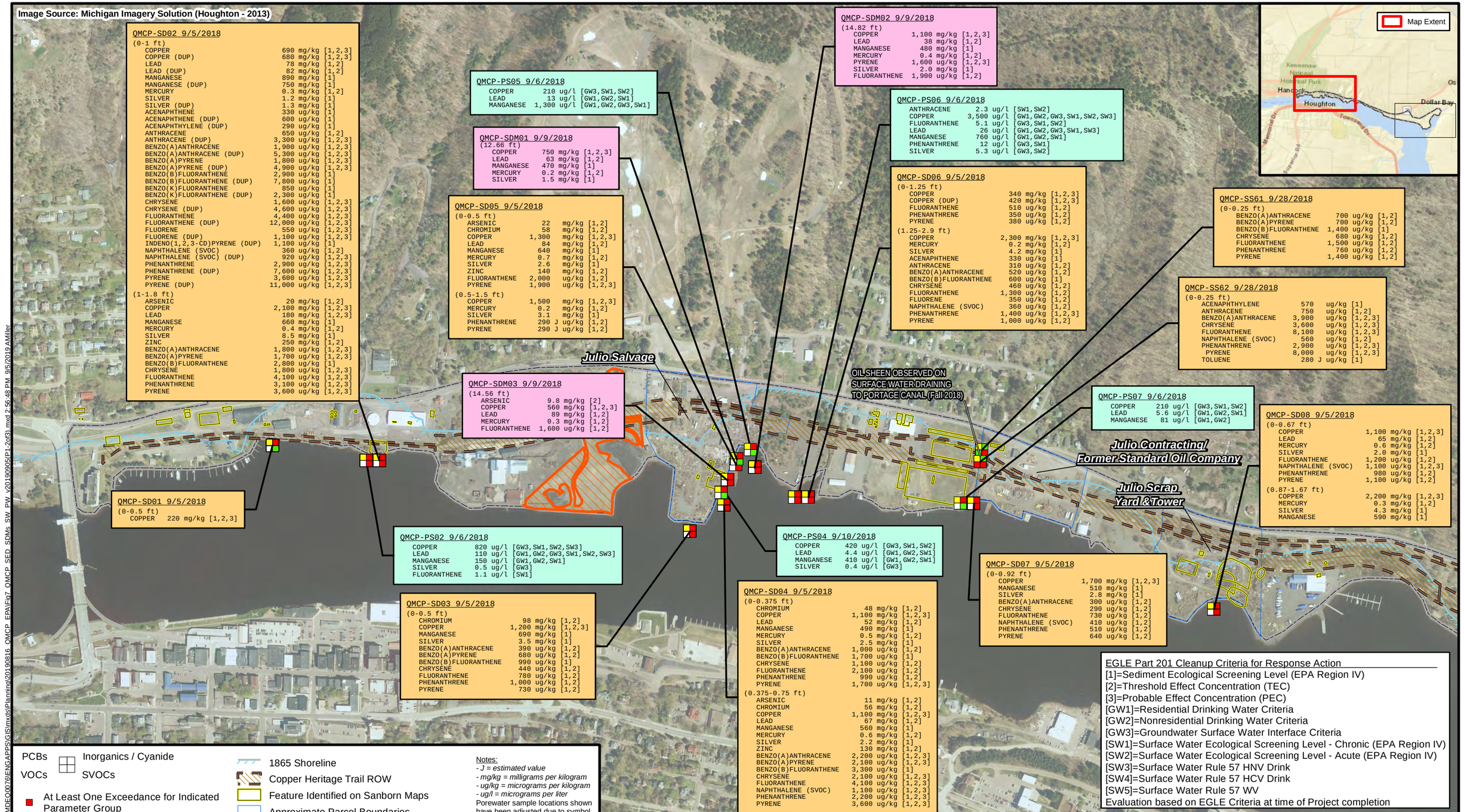

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Figure 7-a

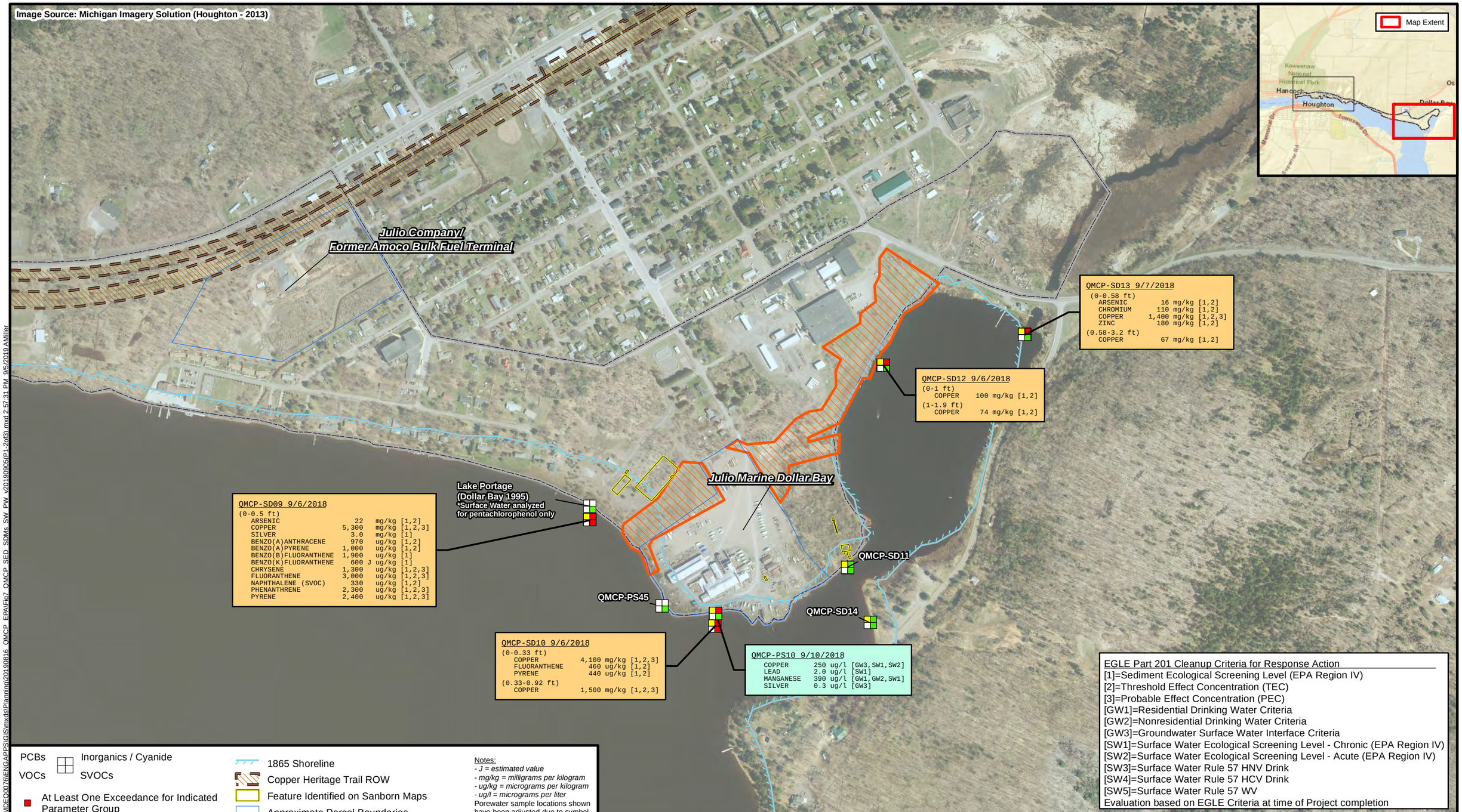
DRAFT

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects_K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:56:48 PM 9/5/2019 AMiller



PCBs
VOCs
Inorganics / Cyanide
SVOCs

- At Least One Exceedance for Indicated Parameter Group
- No Exceedances for Indicated Parameter Group
- At Least One Detection of PCBs
- PCBs Not Detected
- Indicated Parameter Group Not Analyzed

- 1865 Shoreline
- Copper Heritage Trail ROW
- Feature Identified on Sanborn Maps
- Approximate Parcel Boundaries
- EPA Cap Boundary
- QMCP Study Area Boundary

Notes:
- *J = estimated value*
- *mg/kg = milligrams per kilogram*
- *ug/kg = micrograms per kilogram*
- *ug/l = micrograms per liter*

Porewater sample locations shown have been adjusted due to symbol size

N

0 550 Ft

Coordinate System: MIGeoRef(m)

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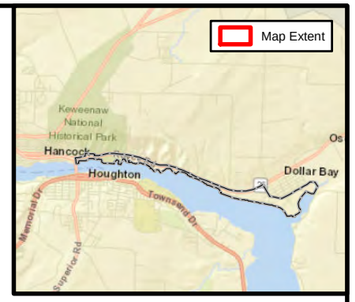
Figure 7-b ***DRAFT***

Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater

Julio Properties - Ripley Waterfront and Dollar Bay

Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_QMCP_EPA\Fig7_QMCP_SED_SDMs_SW_PW_v20190905(P1-2of3).mxd 2:57:31 PM 9/5/2019 AMiller



AREA	Year	Historical Operations
Julio Salvage	1907, 1917, 1928, 1949	Portage Lake Foundry & Machinery
Julio Contracting/ Former Standard Oil Company	1917	Standard Oil Company Other historic land use and/or operations unknown.
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Figure 7-c
DRAFT
Sample Analytical Result Map - Sediment, Submerged Drum Contents, Surface Water and Porewater - Notes
Julio Properties - Ripley Waterfront and Dollar Bay
Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\Planning\20190816_OMCP_EPA\Fig7_OMCP_SED_SDMs_SW_PW_v20190905(P3of3).mxd 2:50:24 PM, 9/5/2019 AMiller