City of Marquette, Michigan
Ranking Criteria for EPA Cleanup Grants

SECTION 1: PROJECT AREA DESCRIPION AND PLANS FOR REVITALIZATION (55 pts)

The City of Marquette (the "City") is a strong, resilient community that has faced significant economic, environmental, and social challenges over the last 35 years. The community has met these issues head on, using a collaborative approach with local, state, and federal government and community partnerships. This foundation of the community working together forms the basis of the approach for the requested EPA Brownfield Cleanup Grant. The City has taken a proactive role in addressing legacy contamination from the former Cliffs Dow property and is proposing a significant remediation project to protect human health, sensitive populations, and the environment, as well as to provide for the redevelopment of a vacant former industrial site.

a. Targeted Area and Brownfields (15 pts)

ii. Overview of Brownfield Challenges and Description of Target Area (5 pts)**:**

- ***Brownfield Challenges and impact on city and targeted area.*** The City was founded in conjunction with the discovery of iron ore deposits in 1844, and grew initially with the mining and industrial manufacturing industries, including the formation of the Marquette Iron Company in 1849. For the next 100 years, the City grew into a major resource for extraction, processing, and shipping center, with the waterfront dominated by industrial activity. When these operations ceased, the community was left with significant areas of the City with contamination that has had a lasting impact on the health and welfare of the City and its residents and businesses. Since the 1970's, the City has been working to actively address the legacy contamination from these operations. These activities have included acquiring property and facilitating private redevelopment and the creation of public facilities and working with the State environmental agency to secure funding for cleanup. Since the passage of Michigan's Brownfield Redevelopment Financing Act (Act 381) in 1996, the City has extensively utilized Brownfield Tax Increment Financing to support redevelopment.
- ***How grant will address challenges.*** The EPA Brownfield Cleanup Grant will provide critical resources to treat contaminated soil and groundwater that has been migrating towards Lake Superior. A key outcome of the remediation funded by the EPA Cleanup Grant will be to pave the way for redevelopment, providing jobs and housing, increasing property tax base, and removing an environmental threat to the residents and neighborhood surrounding the Cliffs Dow site.
- ***Describe specific target areas and where grant activities will be performed.*** The target area for the EPA Brownfield Cleanup Grant is the northeast section of the City. This area of the City is home to Northern Michigan University and a diverse residential community, bordered by former significant industrial operations, including the former Cliffs Dow processing facility and the former Presque Isle Power Plant. The Cliffs-Dow property is a 46-acre parcel that manufactured charcoal pig iron from 1902 until the 1930's, after which acetic acid and methanol, as well as charcoal, were produced until 1969. Cleanup Grant activities will be conducted in the primary impact area identified from environmental investigations that represents approximately 12 acres and will have a positive impact on the future beneficial use of a 46-acre property lot owned by the City.

ii. Description of the Proposed Brownfield Site (10 pts)

Known Contamination and site conditions. Wastes and by-products generated at the Site throughout its operational history were comprised of volatile organic compounds (VOCs), including benzene, toluene, ethylbenzene, and xylenes (BTEX), and semi-volatile organic compounds (SVOCs), specifically phenolic compounds (e.g., 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol), and metals. A series of investigations indicates:

- Widespread cover of fill materials containing sand, gravel, slag, charcoal, cinders, and concrete debris exists at varying depths throughout the Site;
- Tar has been identified in discrete, small pockets extending several feet below the water table in the retort, refinery, and tar settling areas;
- Subsurface tar above or a few feet below the water table is the probable source of groundwater plume contaminants that periodically exceed Part 201 Generic Cleanup GSI criteria at the Lake Superior interface; and
- Several dissolved-phase plume contaminants have periodically exceeded both Generic GSI Criteria and calculated Mixing Zone-Based GSI criteria.

Relevant past and current land uses The Cliffs-Dow property is currently undeveloped. The Cleanup Grant is being sought to ensure protection of public health and the environment and to provide the opportunity for redevelopment to productive use after abandonment fifty years ago. Past industrial use was the source of hazardous substances from the operational history) of the Site. The Site is the former location of the majority of the plant process equipment and buildings from the Cliff-Dows Plant. The Plant operated as a charcoal pig iron plant and then as a wood chemical plant between 1902 and 1969. The Cleveland-Cliffs Iron Company originally developed the area in 1902 for the purpose of manufacturing charcoal pig iron. The production of charcoal pig iron continued until 1930. Subsequently, the Cliffs-Dow Chemical Company was created in 1935 and wood processing operations were installed in areas formerly occupied by the pig iron plant. Between 1935 and 1969, chemical production of acetic acid and methanol were the primary processes at the plant, with charcoal production taking a secondary role. In 1968, the Cliffs-Dow Chemical Company was sold to Georgia-Pacific and E.L. Bruce companies; the wood chemical refining process continued until the plant closed in 1969. The plant produced charcoal and wood chemicals by carbonization and pyrolysis of hardwoods.

b. Revitalization of the Target Area (20 pts)

i. Reuse Strategy and Alignment with Revitalization Plan (10 pts):

- ***Projected reuse or strategy*** The City issued a Request for Proposals (RFP) in 2021 to private developers to propose redevelopment plans for the Site. Through that process, the City selected Veridea Group, a Marquette-based developer with extensive experience in major commercial and residential development. Their proposal outlined a phased approach for residential development, with supportive commercial development. One of the key factors for the redevelopment is to adequately address the environmental conditions that will provide for safe reuse of the property. The Cleanup Grant will directly support remediation that will provide for the redevelopment. The redevelopment plan is also integrated with the realignment of Lakeshore Boulevard with a resilient design and expansion of waterfront public space and access.

- ***Alignment with local master plan*** The City Master Plan envisions a community that is "the Superior location to live, learn, work and enjoy life" with a number of goals to achieve this vision focused on community participation, natural asset protection, transportation, tourism, neighborhood preservation and nurturing a green economy, promoting partnerships and entrepreneurship, and maximizing local talent and goods. The redevelopment of the Cliffs-Dow property is in direct alignment with the vision and goals of the Master Plan to provide for the safe reuse of legacy industrial property along the Lake Superior waterfront, in conjunction with an expanded waterfront park and realignment of Lakeshore Boulevard. The Master Plan highlights the continued efforts of the City through its Brownfield Redevelopment Authority to spur redevelopment of contaminated former industrial and commercial site and explicitly identifies the Cliffs-Dow site as a Brownfield redevelopment opportunity for mixed use to "accommodate retail, professional service/office, and

studio uses fronting both arterial roads and non-arterial roads within residential neighborhoods and in other districts in close proximity to residential uses, or where these mixed-uses would be appropriate."

- ***Describe public engagement for reuse strategy.*** The Cliffs-Dow site has been in the public eye since the City's acquisition in 1997. A portion of the property was sold to Northern Michigan University for campus expansion, adjacent to the Superior Dome, a unique athletic facility for NMU's football, soccer and track teams that is the largest wood dome structure in the world. The overall reuse strategy evolved from the extensive community engagement process for the City Master Plan, which included three citizen workshops, a community survey, and two additional workshops to refine the vision, goals, and recommendations. In addition, the reuse strategy was the subject of a series of City meetings for the Request for Proposals to seek redevelopment proposals from private developers, and the selection of a local developer, Veridea Group, to serve as the Master Developer. Additional public engagement will be undertaken through the site plan review process as the redevelopment is initiated and proceeds.

ii. Outcomes and Benefits of Reuse Strategy (10 pts):

- ***Stimulate economic development in targeted area*** The Cliffs-Dow property has been targeted for private redevelopment for the past 15 years but addressing legacy contamination has limited that opportunity. The EPA Cleanup Grant will provide the key funding to effectuate the safe redevelopment and implement the reuse strategy. Investment for redevelopment of a 46-acre parcel directly adjacent to Lake Superior and the waterfront park for residential and commercial mixed use is anticipated to exceed $100 million over a phased development plan. Not only will the project provide important housing options for the community that is severely lacking appropriate housing stock but is anticipated to generate between $2.0 million and $2.5 million in property taxes for local and state government.

- ***Park, greenway, rec property or other nonprofit uses*** Lakeshore Boulevard is directly adjacent to the Cliffs-Dow property. Climate change and increased weather events caused significant damage to the major waterfront arterial and the City just completed a major realignment and reconstruction of Lakeshore Boulevard, installed resilient shoreline erosion measures, expanded the waterfront public access and park, and improved the City Multi-Use Non-Motorized Path that connects Presque Isle Park to the north, downtown Marquette to the south, and the Iron Ore Heritage Trail. The redevelopment of the Cliffs-Dow property will provide additional Tax Increment Financing (TIF) revenue through a Brownfield Plan to continue investments for recreational improvements along the waterfront.

- ***Renewable energy*** The Cliffs-Dow redevelopment is anticipated to incorporate rooftop solar photovoltaic panels as part of the energy systems for the residential and commercial units. The City has long supported renewable energy through revisions to the zoning code to encourage the installation of decentralized solar energy. Marquette Board of Light and Power installed the Upper Peninsula's first solar garden, where customers, including the residents and business at the Cliffs-Dow redevelopment, can sign up to meet their energy needs through renewable energy.

- ***No businesses or residents will be displaced by remediation or redevelopment*** The Cliffs-Dow site has not had business or residents since 1969 and thus there will be no displacement caused by remediation or redevelopment.

c. Strategy for Leveraging Resources (20 pts)

i. Resources Needed for Site Characterization (5 pts):

- ***Additional funding sources necessary for site characterization*** There has been significant site characterization and monitoring over the past 15 years through a cooperative effort between the City and EGLE/ formerly MDEQ – the Michigan State Environmental Authority. There may be additional site characterization necessary to delineate soil and groundwater contamination to set the baseline for monitoring the efficacy of the remediation. Funding will be provided by the Marquette Brownfield Redevelopment Authority (MBRA) Local Brownfield Revolving Fund (LBFR).

ii. Resources Needed for Site Remediation (5 pts)

- ***Funding sources to contribute to completion of remediation.*** The proposed scope of work for the remediation as outlined in the Analysis of Brownfield Cleanup Alternatives (ABCA) includes the implementation of an In-Situ Chemical Oxidation (ISCO) system. The total anticipated cost for remediation is $1,100,000. The request for EPA Cleanup Grant is $964,250, leaving a balance of $136,750 in additional funding necessary. The source of funding for the upfront remediation balance will be derived from City Funds and LBRF Funds to be reimbursed through TIF revenues through a Brownfield Plan for the Cliffs-Dow redevelopment.

- ***Attach documentation of secured commitments.*** Resolutions of support and commitment from the Marquette City Commission and the City of Marquette Brownfield Redevelopment Authority for continued funding for the Cliffs-Dow Site and support for a Brownfield Plan that would provide TIF for site remediation and redevelopment are included in the Application Appendix.

iii. Resources Needed for Site Reuse (5 pts)

- ***Funding Sources for Reuse*** The predominant funding source for reuse will be private investment by the selected Master Developer, Veridea Group, LLC. There are anticipated to be environmental due diligence activities to provide an exemption from environmental liability for pre-existing contamination and as well as actions taken to fulfill due care obligations to prevent exposure to or exacerbation of pre-existing contamination, including contaminated soil disposal, dewatering effluent treatment, and/or engineering controls. These costs are anticipated to be included in a subsequent Brownfield Plan and reimbursed over time through the capture of TIF revenues generated by the private investment on the Cliffs-Dow Site. In addition, Michigan's Brownfield Redevelopment Financing Act (Act 381) provides for the reimbursement of Non-Environmental Eligible Activities, including site preparation and infrastructure that can help support the project finances. A Brownfield Plan is anticipated to be approved to authorize the capture of TIF funds to reimburse these Brownfield Environmental and Non-Environmental Eligible Activities.

- ***Documentation*** Resolutions of support and commitment from the Marquette City Commission and the City of Marquette Brownfield Redevelopment Authority for continued funding for Cliffs Dow and support for a Brownfield Plan that would provide Tax Increment Financing (TIF) for site remediation and redevelopment are included in the Application Appendix.

Name of Resource	Is the Resource for (1.c.i.) Assessment (1.c.ii) Remediation (1.c.iii) Reuse	Is the Resource Secured or Unsecured?	Additional Details or Information About the Resource
Local Brownfield Revolving Fund - MBRA	(1.c.i.) Assessment (1.c.ii) Remediation	Secured	Act 381 allows for the capture of additional TIF for deposit into a Local Brownfield Revolving Fund to conduct Brownfield Eligible Activities on Brownfield Eligible Property (including Cliffs-Dow)

City Funds/Bonds	(1.c.ii) Remediation	Committed/ Secured	City Funds, including a Bond issue, will provide the upfront funding for gap between the EPA Cleanup Grant and total remediation cost, to be reimbursed through future Brownfield TIF
Brownfield TIF	(1.c.i.) Assessment (1.c.ii) Remediation (1.c.iii) Reuse	Committed/ Secured	Brownfield TIF will be used to reimburse Assessment cost of the LBRF; City Funds/Bonds for the remediation cost gap; and reuse Act 381 Environmental and Non-Environmental Eligible Activities

iv. Use of Existing Infrastructure (5 pts):

- **Description of existing infrastructure use** The existing public infrastructure, including road access, water, sewer, electrical and natural gas services are adequate to serve the proposed reuse of the property.

- **Additional Infrastructure description and funding resources** No additional public infrastructure is anticipated to implement the reuse plan. There is anticipated to be internal infrastructure, including access roads, water, sewer, electric and natural gas connections to the public and private infrastructure systems to provide services to the residential and commercial units that will be the responsibility of the Master Developer.

SECTION 2: COMMUNITY NEED AND COMMUNITY ENGAGEMENT (40 pts)

a. Community Need (25 pts)

i. The Community's Need for Funding: (5 pts)

- ***Socio-economic factors that describe community need*** The City of Marquette and its citizens have faced significant economic hardships, particularly with widespread impacts of COVID on the local economy. The City faced a $1.9 million deficit earlier this year out of a total $11 million budget, due to the loss of major city taxpayers such as the recently shuttered Presque Isle Power Plant, loss of state revenue sharing because the 2020 Census population count was lower than the 2010 Census, the outcome of numerous Michigan Tax Tribunal cases, the impact of the Headlee Amendment which rolls back taxes, and significant increases in expenditures. The City voted to increase the millage rate for the first time since 2005, while addressing the City budget deficit, increases the financial burden of community members. Available housing, especially supply of housing in moderate range, has reached a critically low level. Housing prices continue to increase, available housing is in short supply, the existing housing stock is older and in need of upgrades, and the percentage of owner-occupied housing in Marquette is significant lower (48%) than Marquette County (69%), Michigan (71%) and the US (64%). According to the US Census Bureau, the poverty rate in the City of Marquette is significantly higher than the State of Michigan and the US.

- ***How grant will meet need*** The EPA Cleanup Grant will provide critical funds necessary to prevent migration of contaminated groundwater into Lake Superior, protect human health and the environment, and provide the opportunity to develop housing on a 46-acre site in a key area of the City, with up 500 residential units, ranging from senior living and townhomes to rental apartments serving a range of income levels.

- ***Inability to draw on other funds because of small population and/or low-income of community*** As a small community of just over 20,000 and with a significantly higher poverty rate than the State and US, the City of Marquette has limited funds to devote to the Cliffs-Dow remediation project. The City has devoted significant resources to characterize and monitor soil and groundwater impacts on the Site but does not have a source of funds for this important remediation.

	City of Marquette	State of Michigan	% Difference	U.S.	% Difference	Source
Population	**20,394**	**10,050,811**		**311,893,745**		**(1)**
Unemployment*	**4.60%**	**4.10%**	**12.2%**	**4.40%**	**4.6%**	**(2)**
Poverty Rate	**26.0%**	**13.1%**	**98.5%**	**11.6%**	**76.87%**	**(1)**
Percent Minority	**10.0%**	**25.8%**		**40.7%**		**(1)**
Median Household Income	**$42,745**	**$59,234**	**(27.8%)**	**$64,994**	**(23.4%)**	**(1)**

(1) U.S. Census Bureau https://www.census.gov/quickfacts/fact/table/US/PST045221
(2) Data are from the Bureau of Labor Statistics and are available at www.bls.gov .
*Unemployment rates not available for townships, villages or rural cities.

ii. Threats to Sensitive Populations (20 pts) ***(To Be Completed)***

1) Health or Welfare of Sensitive Population: (5 pts)

2) Greater Than Normal Incidence of Disease and Adverse Health Conditions: (5 pts)

3) Promoting Environmental Justice: (10 pts)

b. Community Engagement (15 pts)

i. Project Involvement (5 pts) The City has a long and strong history of partnerships with community organizations to meet challenges and pursue opportunities. The cleanup and redevelopment of the Cliffs-Dow property is no exception. The City intends to engage a diverse group of community organizations, including environmental, housing, economic development, higher education, and major employers to seek input regarding and share updates on project progress, outcomes, and outputs. The City is currently updating the Community Master Plan and has developed a robust and extensive Community Engagement Plan that identifies the key engagement audiences, communication channels, and process. The Cliffs-Dow Cleanup and Redevelopment Project can fit perfectly into the timeline and process and leverage community input opportunities of the forthcoming updated Community Master Plan.

ii. Project Roles: (5 pts) The organizations and community partners listed below are anticipated to be engaged both through the Community Master Plan process as well as a separate track to provide input, technical support, outreach and, in some cases, leverage funding to support the remediation and the redevelopment.

The following is a list of community partners.

Partner Name	Point of Contact	Specific Role in Project
Marquette Brownfield Redev Authority	Sheri Davie, Executive Director	Leveraged Funding
Marquette Housing Commission	Sharon Maki, Executive Director	Financing Technical Support
Northern Michigan University	Brock Tessman, President	Outreach
Superior Watershed Partnership	Carl Lindquist, Executive Director	Technical Support - Outreach
South Shore Fishing Association	Todd Scott, President	Technical Support - Outreach
Keweenaw Bay Indian Community	Brigitt LaPointe, CEO	Technical Support - Outreach
UP Health Systems Marquette	Gar Atchison, CEO	Outreach
Lake Superior Community Partnership	Christopher Germain, CEO	Economic Development

iii. Incorporating Community Input: (5 pts) In conjunction with the Community Master Plan process, there will be a link with the website www.marquettemasterplan.org to provide updates on input opportunities, project approach and progress, and outcomes and outputs. Updates will be provided on at least a monthly basis or at major project milestones. Questions will be included in the online survey regarding the Cliffs-Dow Cleanup and Redevelopment Plan and the project will be one of the highlighted opportunities at community open houses and stakeholder input sessions.

SECTION 3: TASK DESCRIPTIONS, COST ESTIMATES, AND MEASURING SUCCESS (55 pts)

a. Proposed Cleanup Plan (10 pts)

The selected Cleanup approach to address soil and groundwater contamination at the Cliffs Dow Site is In-Situ Chemical Oxidation (ISCO). Historical operations at the Site dating back to 1902 included the production of charcoal pig iron, then production of acetic acid and methanol. These operations resulted in releases of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) from the former tar settling and refining process areas in soil that impacted groundwater which is migrating toward Lake Superior. These Constituents of Concern (COCs) exceed EGLE Generic Cleanup Criteria in soil and exceed calculated Chronic Mixing-Zone Based Groundwater-Surface Water (GSI) Criteria and Acute Mixing Zone Based GSI Criteria.

ISCO injects chemical oxidants below the ground into soil and groundwater that chemically converts hazardous compounds to nonhazardous or less toxic compounds that are more stable, less mobile or inert. Advantages of ISCO include the ability to rapidly treat impacts in-situ without the need to bring impacted media to ground surface for treatment. These characteristics, along with the ability to selectively inject the reactant and flexibility in the selection of injection locations, make this method useful and highly advantageous for large areas. An ISCO approach does not generate large volumes of waste, which reduces contaminant exposure, time, and costs because waste disposal or treatment is minimal.

b. Description of Tasks/Activities and Outputs (25 pts)

Task/Activity 1: Procurement

i. ***Project Implementation*** (10 pts): The City Community Development Director and Engineer will prepare a Request for Proposal for the environmental consultant to oversee the project, procure the ISCO contractor, conduct monitoring and prepare reports. Once under contract, the environmental consultant will prepare the performance design and bid specifications and manage the procurement process for the ISCO contractor. There is a minimal allocation of EPA funds for City staff to manage the procurement process. Any additional expenses will be covered in-kind by the City. EPA funds are allocated for the environmental consultant to prepare the performance design and bid specifications.

ii. ***Schedule*** (5 pts): Assuming the execution of the Cooperative Agreement to provide funding as of October 1, 2023, the Procurement task is anticipated to take six months, from October 2023 to April 2024, two months to procure the environmental consultant and four months for design, specs, and ISCO contractor procurement.

iii. ***Lead*** (5 pts): The City Community Development Director and Engineer will co-lead the Procurement task.

iv. ***Outputs*** (5 pts): RFP and contractor for environmental consultant, Performance Design and Bid Specifications, and ISCO contract.

Task/Activity 2: Implement ISCO Remediation System

i. ***Project Implementation***: The selected ISCO contractor will mobilize to the Site and install the push probe rods at selected locations determined jointly by the environmental consultant and the ISCO contractor, approved by the City Project Manager who is designated below in Section 4. Any costs over the EPA Cleanup Grant budget will provided through the City with Brownfield TIF reimbursement.

ii. ***Schedule***: Mobilization will be Spring 2024 as soon as snow clears on the Site. Injection of ISCO is anticipated to take up to one to two months, with start up in Summer 2024. Follow up application of ISCO may be necessary in select areas, based on monitoring results.

iii. ***Lead***: The selected environmental consultant will lead the supervision of the ISCO system installation and operation by the selected contractor.

iv. ***Outputs***: Mapping of injection points and expected zones of influence.

Task/Activity 3: Monitoring and Reporting

i. ***Project Implementation***: The environmental consultant will develop a monitoring and reporting plan in the initial phase of the project for approval by EGLE and implement as appropriate. Monitoring results will be shared with EGLE and the Project Team, as well as posted on the project website. Any costs over the EPA Cleanup Grant budget will provided through the City with Brownfield TIF reimbursement.

ii. ***Schedule***: The Monitoring and Reporting Plan will be prepared and approved by EGLE within one month of the selection of ISCO contractor.

iii. ***Lead***: The environmental consultant will lead the monitoring and reporting, with oversight by the City Community Development Director and Engineer.

v. ***Outputs***: Monitoring reports.

Task/Activity 3: Eligible Programmatic Activities

i. ***Project Implementation***: Reporting, project management, and budget management and administration for the EPA Cleanup Grant will be conducted by City Staff, with support from the environmental consultant. Quarterly reports and other documentation required by EPA will be prepared and submitted, with all budget management through the City Finance Office.

ii. ***Schedule***: Administration and project management will begin with execution of the Cooperative Agreement and continue through Grant closeout.

iii. ***Lead***: City Community Development Director, with support from the City Engineer and City Chief Financial Officer.

v. ***Outputs***: Quarterly reports, Annual SF 425, MBE/WBE Monitoring Report, Financial Reports

c. Cost Estimates (15 pts)

The City of Marquette is requesting an EPA Brownfield Cleanup Grant in the amount of **$964,250** for the Cliffs-Dow property.

Budget Categories	Task 1. Procurement	Task 2. Implement ISCO `	Task 3. Monitoring and Reporting	Task 4. Eligible Programmatic Activities	Totals
Cleanup Grant Budget					
Personnel	$3,000.00	$2,000.00	$2,000.00	$10,000.00	$17,000.00
Fringe Benefits	$750.00	$500.00	$500.00	$2,500.00	$4,250.00

Travel					
Equipment					
Supplies					
Contractual	$10,000.00	$800,000.00	$125,000.00	$8,000.00	$943,000.00
Total Direct Costs	$13,750.00	$802,500.00	$127,500.00	$20,500.00	$964,250.00
Indirect Costs					
Total Budget	$13,750.00	$802,500.00	$127,500.00	$20,500.00	$964,250.00

d. Measuring Environmental Results (5 pts)

The City will track and measure progress by monitoring and reporting on environmental outputs and outcomes, pursuant to EPA Order 5700.7, "Environmental Results under EPA Assistance Agreements."

Short Term Outputs	Public meetings held	Attendees at public meetings
	Organizations represented at public meetings	Community organizations assisting the Program
		Community organizations contacted for assistance
	Soil Volumes Remediated	Groundwater Volumes Remediated
Short Term Outcomes	COC Concentration Reduction	Redevelopment Design Plans
Long Term Outcomes	Redevelopment	Total funds leveraged
	Jobs created	Taxes generated from project
	Property with reduced exposure to contaminants	Acres redeveloped and remediated
	Housing units, commercial space, parkland	Spinoff redevelopment

The project outputs will be tracked by the City Project Manager for the duration of the project and compiled in quarterly reports submitted to the EPA Project Officer.

SECTION 4: PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE (30 pts)

a. Programmatic Capability (15 pts)

i. /ii. Organizational Structure/Description of Key Staff: (10 pts) The City of Marquette will be the grantee. The project director for Cliffs-Dow EPA Cleanup Grant will be Karen Kovacs, City Manager. Karen has over 7 years of experience in governmental and service delivery and was appointed as the City Manager in May 2021. The City Project Manager will be Dennis Stachewicz, Community Development Director, with over 20 years of private and public service and grant management experience. City Engineer Mikael Kilpela will provide technical support and project management. Grant fund revenues and expenditures are accounted for in the City financial system. The City Chief Financial Officer has over 15 years of experience of local government management and accounting and will work closely with the Project Manager to ensure all grant revenues and expenses are consistent with the grant agreement. An environmental consulting firm will be selected to assist in implementing the EPA approved grant work plan.

iii. Acquiring Additional Resources: (5 pts) The City will prepare a Request for Proposals to secure an environmental consultant to assist with project implementation, prepare assessment and cleanup work plans as necessary, procure the ISCO contractor, oversee remediation, and prepare project

documentation. The environmental consultant RFP is anticipated to be released, proposals due, and the contractor procurement, in **Fall 2023.** The selected environmental consultant will prepare an RFP with specification for the ISCO contractor that will perform the ISCO application..

b. Past Performance and Accomplishments (15 pts)

i. Prior EPA Brownfield Grants: The City of Marquette has not previously received any EPA brownfield grant funds.

ii. **Other Federal or Non-Federal Assistance Agreements:** The most recent Federal Financial Assistance Single Audit for FY 2021 concluded, in the opinion of Anderson Tackman & Company, PLC, Certified Public Accountants which conducted the Single Audit, that City complied, in all material aspects, with the types of compliance requirements that could have a direct and material effect on each of its major federal programs for the year ending September 30, 2021 for a total of $1,112,525 in expenditures of Federal Financial Assistance. The following is a description of selected grant purpose and accomplishments, compliance with grant compliance, and reporting;

Safe Routes to Schools Sidewalk – MDOT/FHWA

1. Purpose and Accomplishment: Funding for the construction of a key link from neighborhoods to a local school. Amount ***$181,438***

2. Grant Compliance: The project has been completed, with all terms and conditions of the grant agreement, including reporting, have been met.

FEMA Hazardous Mitigation Grant

1. Purpose and Accomplishment: Relocation of Lakeshore Boulevard further inland due to storm damage. The amount of $1,946,000 with a match of $1,028,000

2. Grant Compliance: The project has been completed, with all terms and conditions of the grant agreement, including reporting, have been met.

Coastal Resiliency – EGLE/NOAA

1. Purpose and Accomplishment: Restoration of a section of Marquette's shoreline and habitat restoration in the amount of $140,800 with a match of $140,800

2. Grant Compliance: The project has been completed, with all terms and conditions of the grant agreement, including reporting, have been met.

DOCUMENTATION OF ALL APPLICABLE THRESHOLD CRITERIA

Marquette EPA Brownfield Cleanup Project
City of Marquette, Michigan
Threshold Criteria for Site Assessment Grants

1. APPLICANT ELIGIBILITY

The City of Marquette (the "City") is a Michigan municipal corporation, an eligible entity for an EPA Cleanup Grant.

2. PREVIOUSLY AWARDED CLEANUP GRANTS

The proposed Cliffs-Dow site (the "Site"), has not received funding from a previous awarded EPA Brownfield Cleanup Grant

3. EXPENDITURE OF EXISTING MULTIPURPOSE GRANT FUNDS

The City does not have an open EPA Brownfield Multipurpose Grant.

4. SITE OWNERSHIP

The City owns the Site in fee simple with a recorded deed, and the property acquired in October 1997.

5. BASIC SITE INFORMATION

a) **Site Name:** Cliffs-Dow
b) **Address:** 100 Wright Street and 2001 Lakeshore Boulevard, Marquette, Michigan 49855
c) **Current Owner:** City of Marquette

6. STATUS AND HISTORY OF CONTAMINATION AT THE SITE

a. **Hazardous/Petroleum:** The Site is contaminated by hazardous substances, but not petroleum.

b. **Operational History and Current Use:** Former location of the majority of the plant process equipment and buildings from the Cliff-Dows Plant. The Plant operated as a charcoal pig iron plant and then as a wood chemical plant between 1902 and 1969. The Cleveland-Cliffs Iron Company originally developed the area in 1902 for the purpose of manufacturing charcoal pig iron. The production of charcoal pig iron continued until 1930. Subsequently, the Cliffs-Dow Chemical Company was created in 1935 and wood processing operations were installed in areas formerly occupied by the pig iron plant. Between 1935 and 1969, chemical production of acetic acid and methanol were the primary processes at the plant, with charcoal production taking a secondary role. In 1968, the Cliffs-Dow Chemical Company was sold to Georgia-Pacific and E.L. Bruce companies; the wood chemical refining process continued until the plant closed in 1969.

c. **Environmental Concerns:** A series of environmental investigations indicates widespread cover of fill materials containing sand, gravel, slag, charcoal, cinders, and concrete debris exists at varying depths throughout the Site; tar residuals in discrete small pockets extending several feet below the water table in the retort, refinery, and tar settling area as a probable source of groundwater plume contaminants that periodically exceed Part 201 Generic Cleanup GSI criteria at the Lake Superior interface; and several dissolved-phase plume contaminants have periodically exceeded both Generic GSI Criteria and calculated Mixing Zone-Based GSI criteria.

d. Origin, Nature and Extent of Contamination: The plant produced charcoal and wood chemicals by carbonization and pyrolysis of hardwoods. This process entailed heating the wood in the absence of air and producing charcoal, condensable volatiles (pyroligneous acid) and non-condensable volatiles (wood gas). The pyroligneous acid and charcoal, the primary feedstocks for plant products, were produced in heated, airtight vessels, called

retorts, causing a chemical reaction that separated the pyroligneous acid and charcoal into two different process streams. The pyroligneous acid was collected and further processed by separation and distillation to produce methanol, acetic acid, and other saleable chemicals. Charcoal was recovered from the retorts and physically processed into salable sizes. A portion of the charcoal also was further chemically altered to produce activated carbon.

Wastes and by-products generated at the Site throughout its operational history were comprised of volatile organic compounds (VOCs), including benzene, toluene, ethylbenzene, and xylenes (BTEX), and semi-volatile organic compounds (SVOCs), specifically phenolic compounds (e.g., 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol), and metals.

Results of previous extensive environmental investigation have provided the following general conclusions:

- Fill materials containing dredged harbor sediments, sand, gravel, slag, charcoal, cinders, and concrete debris exist at varying depths throughout the Site;
- The former tar settling and refinery process areas contain soil with volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) that exceed Generic Cleanup Criteria established by the Michigan Department of Environment, Great Lakes and Energy (EGLE);
- Soil with tar has been identified in discrete, small pockets extending several feet below the water table located approximately six feet below grade in the retort, refinery, and tar settling areas;
- Soil with tar deposits adjacent to buried wood timbers and tar-filled piping have been discovered approximately three to six feet below grade near the southwest portion of the Site, directly upgradient (west) of the Site's most impacted groundwater monitoring wells. Wastes and/or tar inside this piping leading from a former off-site settling lagoon located west of the Site is thought to be contributing to groundwater impacts on the Site;
- Additional tar conveyances (i.e., pipes and troughs) and storage vessels may be present in the subsurface based on indications presented in historical drawings and observations made during 2011 tar removal activities;
- Groundwater contamination has been identified through numerous groundwater monitoring events in a dissolved phase plume that emanates near the southwest portion of the Site and extends to the shore of Lake Superior; and
- Groundwater monitoring has identified select VOCs and SVOCs at concentrations that exceed calculated Chronic Mixing-Zone Based Groundwater-Surface Water (GSI) Criteria and Acute Mixing Zone Based GSI Criteria. These calculated GSI Criteria were established for the site by Michigan Department of Environmental Quality ("MDEQ"), now EGLE, in November 2017.

7. BROWNFIELD SITE DEFINITION

CERCLA defines a Brownfield Site as: "...real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." Brownfield sites include residential, commercial, and industrial properties. The Site is impacted by VOCs and SVOCs above EGLE Generic Cleanup Criteria that complicates the reuse of the site for residential and commercial purposes.

The Site is not listed or proposed for listing on the National Priorities List (NPL); subject to unilateral administrative orders, court orders, administrative orders on consent, or judicial consent decrees issued to or entered into by parties under CERCLA; or subject to the jurisdiction, custody, or control of the U.S. government.

8. ENVIRONMENTAL ASSESSMENT REQUIRED FOR CLEANUP GRANT APPLICATION

Investigations of source areas and groundwater monitoring relative to associated risks at the former plant were conducted between 1981 and the present (including O'Brien & Gere, 1990; ENSR, 1994; Barr, 1998; TriMedia, 2001; TriMedia, 2009; TriMedia, 2010; TriMedia, 2011; TriMedia, 2012; TriMedia, 2013; TriMedia, 2014; TriMedia, 2016; TriMedia, 2017; TriMedia, 2018; TriMedia, 2019; TriMedia, 2020; TriMedia, 2021; TriMedia 2022). These investigations have included studies of soil contamination, groundwater contamination, exposure evaluation, and contaminant migration.

9. SITE CHARACTERIZATION

The City is not a State or Tribal Environmental Authority. The City is conducting environmental response activities voluntarily and is not under a consent order or court order, subject to an enforcement action, or otherwise conducting environmental response activities on an involuntary basis. A letter from the EGLE Redevelopment and Remediation Division, Michigan's Environmental Authority, affirms that the City is voluntarily conducting environmental response activities and indicates that there is sufficient level of site characterization from the environmental site assessment performed to date for the remediation work to begin on the site.

10. ENFORCEMENT OR OTHER ACTIONS

The City affirms that there are no known ongoing or anticipated environmental enforcement or other actions related to the Site for which Brownfield Grant funding is sought.

11. SITES REQUIRING A PROPERTY-SPECIFIC DETERMINATION

The Site does not meet any of the criteria requiring a Property-Specific Determination and therefore does not require a Property-Specific Determination.

12. THRESHOLD CRITERIA RELATED TO CERCLA/PETROLEUM LIABILITY

a. Property Ownership Eligibility – Hazardous Substances Sites

ii. **EXCEPTIONS TO MEETING THE REQUIREMENT FOR ASSERTING AN AFFIRMATIVE DEFENSE TO CERCLA LIABILITY**

(1) The City acquired the Site in October 1997. Thus, the Site is publicly owned and was acquired prior to January 11, 2002.

(a) The City voluntarily acquired the Site from Georgia-Pacific and E.L Bruce Companies.

(b) The City acquired the Cliffs-Dow site in October 1997.

(c) All of the hazardous substance releases at the Site occurred prior to the City's acquisition.

(d) The City affirms that it has not caused or contributed to any release of hazardous substances at the Site.

(e) The City affirms that it has not, at any time, arranged for disposal or caused a release of hazardous substances or transported hazardous substances to the Site.

13. CLEANUP AUTHORITY AND OVERSIGHT STRUCTURE

a. Cleanup Oversight

A Certified Environmental Professional under contract with the City will oversee all cleanup activities, including contractor procurement, contract management, design and work plan review and approval, contractor oversight, monitoring, and reporting. Regulatory oversight will be provided by the EGLE Redevelopment and Remediation Division, the State Environmental Authority. The City's Director of Community Development and Engineer will serve as the Owner's representative and coordinate activities with the selected environmental contractor to ensure EGLE compliance and open lines of communication among all involved parties.

b. Neighboring Property Access

No neighboring property access is required or anticipated under the EPA Brownfield Cleanup Grant.

14. COMMUNITY NOTIFICATION

a. Draft Analysis of Brownfield Cleanup Alternatives

The Draft Analysis of Brownfield Cleanup Alternatives has been prepared and made available for public comment, with community notification outlined below.

b. Community Notification Ad

A community notification ad was published in the Marquette Mining Journal, the local newspaper of general distribution and posted on the City website on November 2, 2022, at least 14 calendar days before the application is submitted to EPA.

c. Public Meeting

A public meeting was held on Thursday, November 10, 2022 at 6:00 p.m. at the City Municipal Service Center, 1100 Wright Street, Marquette, Michigan.

d. Submission of Community Notification Documents

1. **Draft ABCA**
2. **Newspaper Ad**
3. **Comments**
4. **Applicants Response**
5. **Meeting Notes**
6. **Meeting Sign-in Sheet**

15. CONTRACTORS AND NAMED SUBRECIPIENT

a. Contractors

The City will issue a Request for Proposal for Environmental Consultants and Remediation Contractor in compliance with the fair and open competition requirements in 2 CFR Part 200 and 2 CFR Part 1500.

b. Subrecipients

No subrecipients are proposed or anticipated under the EPA Brownfield Cleanup Grant.

NARRATIVE PROPOSAL ATTACHMENTS

Documentation Indicating Committed Firm Leveraged Resources

Marquette City Commission Resolution

City of Marquette Brownfield Redevelopment Authority Resolution

Submission of Community Notification Documents

Draft ABCA

Newspaper Ad

Comments

Applicants Response

Meeting Notes

Meeting Sign-in Sheet

Analysis of Brownfields Cleanup Alternatives – Preliminary Evaluation
Former Cliffs Dow Site - Marquette, Michigan

Prepared by the City of Marquette

I. Introduction & Background

a. Site Location (*address*)

The Site occupies two parcels in Marquette, Michigan, 100 Wright Street and 2001 Lakeshore Boulevard. Hawley Street is the northern border, Wright Street is the southern border, Lakeshore Boulevard is the eastern border, and an abandoned railroad right of way is the western border.

b. Previous Site Use(s) and any previous cleanup/remediation

Previous Site Use(s)

The Site is the former location of the majority of the plant process equipment and buildings from the Cliff-Dows Plant. The Plant operated as a charcoal pig iron plant and then as a wood chemical plant between 1902 and 1969. The Cleveland-Cliffs Iron Company originally developed the area in 1902 for the purpose of manufacturing charcoal pig iron. The production of charcoal pig iron continued until 1930. Subsequently, the Cliffs-Dow Chemical Company was created in 1935 and wood processing operations were installed in areas formerly occupied by the pig iron plant. Between 1935 and 1969, chemical production of acetic acid and methanol were the primary processes at the plant, with charcoal production taking a secondary role. In 1968, the Cliffs-Dow Chemical Company was sold to Georgia-Pacific and E.L. Bruce companies; the wood chemical refining process continued until the plant closed in 1969.

Previous Cleanup / Remediation

In 1994, a total of 235 tons of tar-impacted material were removed from the Site by the previous owners, prior to the City taking possession of the site in 1997.

The City demolished the buildings on the Site after acquiring the property. Asbestos abatement was conducted as required prior to the demolition. Limited tar removal activities following focused assessment activities at a portion of the Site resulted in the excavation and disposal of approximately 845 tons of tar-impacted materials in the summer of 2011. These tar-impacted materials contained the same contaminants found in groundwater at the Site and likely were causing or contributing to the groundwater problems or impairment.

c. Site Assessment Findings

Investigations of source areas and groundwater monitoring relative to associated risks at the former plant were conducted between 1981 and the present (including O'Brien & Gere, 1990; ENSR, 1994; Barr, 1998; TriMedia, 2001; TriMedia, 2009; TriMedia, 2010; TriMedia, 2011; TriMedia, 2012; TriMedia, 2013; TriMedia, 2014; TriMedia, 2016; TriMedia, 2017; TriMedia, 2018; TriMedia, 2019; TriMedia, 2020; TriMedia, 2021; TriMedia 2022). These investigations have included studies of soil contamination, groundwater contamination, exposure evaluation, and contaminant migration. Results of these previous activities have provided the following general conclusions:

1) Fill materials containing dredged harbor sediments, sand, gravel, slag, charcoal, cinders, and concrete debris exist at varying depths throughout the Site;

2) The former tar settling and refinery process areas contain soil with volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) that exceed Generic Cleanup Criteria established by the Michigan Department of Environment, Great Lakes and Energy (EGLE);

3) Soil with tar has been identified in discrete, small pockets extending several feet below the water table located approximately six feet below grade in the retort, refinery, and tar settling areas;

4) Soil with tar deposits adjacent to buried wood timbers and tar-filled piping have been discovered approximately three to six feet below grade near the southwest portion of the Site, directly upgradient (west) of the Site's most impacted groundwater monitoring wells. Wastes and/or tar inside this piping leading from a former off-site settling lagoon located west of the Site is thought to be contributing to groundwater impacts on the Site;

5) Additional tar conveyances (i.e., pipes and troughs) and storage vessels may be present in the subsurface based on indications presented in historical drawings and observations made during 2011 tar removal activities;

6) Groundwater contamination has been identified through numerous groundwater monitoring events in a dissolved phase plume that emanates near the southwest portion of the Site and extends to the shore of Lake Superior; and

7) Groundwater monitoring has identified select VOCs and SVOCs at concentrations that exceed calculated Chronic Mixing-Zone Based

Groundwater-Surface Water (GSI) Criteria and Acute Mixing Zone Based GSI Criteria. These calculated GSI Criteria were established for the site by Michigan Department of Environmental Quality ("MDEQ"), now EGLE, in November 2017.

d. Project Goal

The City's goal for the Site is to ensure protection of Lake Superior, prevent exposure to contamination, and facilitate the construction of a mixed-use residential and commercial development that advances the objectives of the City's Community Master Plan.

II. Applicable Regulations and Cleanup Standards

a. Cleanup Oversight Responsibility (*identify the entity, if any, that will oversee the cleanup, e.g., the state, Licensed Site Professional, other required certified professional)*

A Certified Environmental Professional under contract with the City will oversee all cleanup activities, including contractor procurement, contract management, design and work plan review and approval, contractor oversight, monitoring, and reporting. Regulatory oversight will be provided by the EGLE Remediation Division, the State environmental authority. The City's Director of Community Development and Engineer will serve as the Owner's representative and coordinate activities with the selected environmental contractor to ensure EGLE compliance and open lines of communication among all involved parties.

b. Cleanup Standards for major contaminants

Cleanup Standards that apply to the Site include Michigan Part 201 Generic Cleanup Criteria (Part 201 Criteria) and Calculated Mixing-Zone Based GSI Criteria.

The Constituents of Concern (COCs) include VOCs and SVOCs in soil and groundwater. Relevant exposure pathways associated with the COCs include groundwater transport, GSI, and vapor intrusion for future mixed use.

A Restrictive Covenant is tied to the Site that restricts the use of the Site to Non-Residential purposes absent approval by EGLE. Thus, Non-Residential Cleanup Standards apply at present. The property is served by City water. As a result, if the remaining relevant exposure pathway of vapor intrusion can be addressed in conjunction with the redevelopment, residential use on the Site should be approved by EGLE and the Restrictive Covenant can be removed.

c. Laws & Regulations Applicable to the Cleanup

The state law and standards applicable to cleanup are as set forth in the Michigan Natural Resources and Environmental Protection Act ("NREPA"), Part 201 GSI criteria ("Section 20120e – Response activity providing for venting groundwater"); NREPA Part 31, Water Resources Protection; and Michigan Administrative Code R 323.1057.

In addition, all appropriate permits will be obtained prior to the work commencing.

III. Evaluation of Cleanup Alternatives

a. Cleanup Alternatives Considered

To address contamination at the Site, three different alternatives were considered:

Alternative #1: No Action

Alternative #2: Permeable Reactive Barrier (PRB): Installation of a barrier that combines a passive chemical or biological treatment zone with restriction of groundwater flow

Alternative #3: In-Situ Chemical Oxidation (ISCO): Injection of chemical oxidants that break down hazardous compounds into non-hazardous or inert compounds.

b. Cost Estimate of Cleanup Alternatives

The effectiveness, implementability, and cost of each alternative was considered in selecting a recommended cleanup alternative.

<u>Effectiveness</u>

- Alternative #1: No Action

  No Action is not effective in working to eliminate contaminants at the Site to make the property available and safe for reuse and redevelopment. EGLE is not anticipated to approve a No Action approach to the Site.

- Alternative #2: Permeable Reactive Barrier

  This is a method for remediating contaminated groundwater that combines a passive chemical or biological treatment zone with subsurface fluid flow management.

  Issues with effectiveness for this method include the need to replenish or regenerate the reactive media after it is depleted or has lost its ability to absorb or adsorb additional COCs. Adsorption media such as granular activated carbon or similar media could provide a substrate for biodegradation of retained COC's. But the use of a PRB also would not remediate source area soil impacts at the Site.

- Alternative #3: In-Situ Chemical Oxidation.

  In-situ injection of chemical oxidants would involve advancing push-probe rods at selected locations and injecting the material into the subsurface.

  In situ chemical oxidation, also referred to as ISCO, is an aggressive remediation technology that has been applied to a wide range of volatile and semi-volatile hazardous contaminants, including DNAPL source zones and the dissolved-phase chemicals emanating from the source zones.

  Chemical oxidation typically involves reduction/oxidation (redox) reactions that chemically convert hazardous compounds to nonhazardous or less toxic compounds that are more stable, less mobile, or inert. Redox reactions involve the transfer of electrons from one compound to another. Specifically, one reactant is oxidized (loses electrons) and one is reduced (gains electrons). The oxidizing agents most commonly used for treatment of hazardous contaminants in soil and groundwater are hydrogen peroxide, catalyzed hydrogen peroxide, potassium permanganate, sodium permanganate, sodium persulfate, and ozone.

  Each oxidant has advantages and limitations, and while applicable to soil contamination and some source zone contamination, they have been applied primarily toward remediating groundwater. (Source: EPA - https://clu-in.org/techfocus/default.focus/sec/In_Situ_Oxidation/cat/Overview/)

  Advantages of ISCO include the ability to rapidly treat impacts in-situ without the need to bring impacted media to ground surface for

treatment. ISCO can enhance mass transfer through heat generated from the reactions. This generated heat can increase reaction rates, microbial activity and therefore efficiency. These characteristics, along with the ability to selectively inject the reactant and flexibility in the selection of injection locations, make this method useful and highly advantageous for large areas. An ISCO approach does not generate large volumes of waste, which reduces contaminant exposure, time, and costs because waste disposal or treatment is minimal (Interstate Technology and Regulatory Council, 2005).

Implementability

- Alternative #1: No Action

  No Action is easy to implement since no actions will be conducted. However, EGLE is not anticipated to approve a No Action approach due to existing exceedance of Generic Cleanup Criteria at the GSI monitoring points.

- Alternative #2: Permeable Reactive Barrier / Sheet Piling Treatment Zone

  One known potential obstacle is that PRBs are more effective if "keyed" into a lower impermeable layer. No such impermeable layer was encountered during installation of GSI monitoring wells in 2009 as deep as 55 feet below grade.

- Alternative #3: In-Situ Chemical Oxidation

  Application of the technology is not complex. The materials are readily available from several manufacturers and a number of vendors offer the ability to implement this technology. Effects of the treatment are monitored through routine groundwater monitoring.

Cost

- Alternative #1: No Action – no additional cost.

- Alternative #2: Permeable Reactive Barrier -- Estimated cost of $1,000,000 to $1,300,000

- Alternative #3: In-Situ Chemical Oxidation - Estimated cost of $750,000 to $1,200,000

c. Recommended Cleanup Alternative

The recommended cleanup alternative is Alternative #3: In-Situ Chemical Oxidation.

Alternative #1: No Action cannot be recommended since it does not address site contamination and is not approvable by EGLE.

Alternative #2 - The PRB is more expensive than Alternative #3, requires ongoing maintenance / replacement of treatment media, there are potential site-specific hydrogeological challenges to this method in its most effective positioning, and does not address upgradient impacts to soil and groundwater.

Alternative # 3 – ISCO costs less than Alternative # 2, there are no known obstacles to optimal implementation, there is no known associated maintenance, and this method will have an impact on the source areas at the Site.

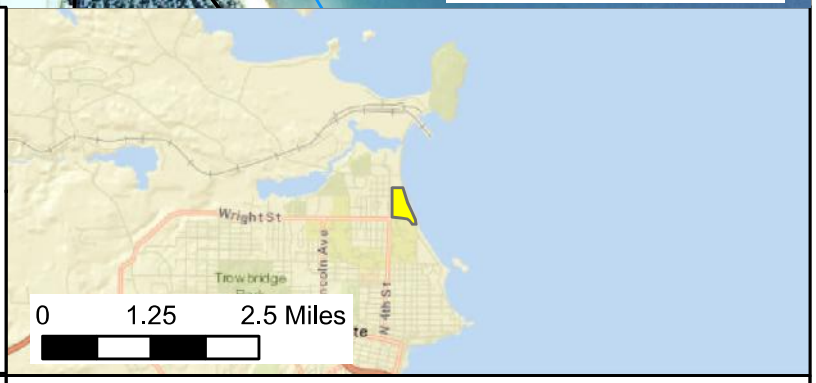
For these reasons, Alternative #3: In-Situ Chemical Oxidation (ISCO) is the recommended alternative.

T48N, R25W
Sec 11 & 14
Marquette County
Marquette
Michigan

Legend

- Former Cliffs-Dow Plant Property
- Project Site

N



TRIMEDIA
ENVIRONMENTAL & ENGINEERING

Former Cliffs - Dow Site
Marquette, Michigan

PROJECT: 99-059	CHK'D: RJW
DGN: RJW	APP'D RJW
DWN: KGK	DATE: 11/9/2020

Figure 1
Site Location

TRIMEDIA
JOB NUMBER
99-059

SHEET TITLE:
Estimated Extent of Dissolved Phase Groundwater Plume

FIGURE NUMBER
5

DESIGNED: RJW
DRAWN: KGK
CHECKED: RJW
APPROVED: RJW

DATE	DESCRIPTION:	ISSUED:

City of Marquette
Former Cliffs - Dow Site
Groundwater Plume
Marquette, Michigan

TRIMEDIA
ENVIRONMENTAL & ENGINEERING

Document Path: G:\Projects\1999\99-059 City of Marquette\GIS\MXD\10-23-2020\Fig-7.mxd