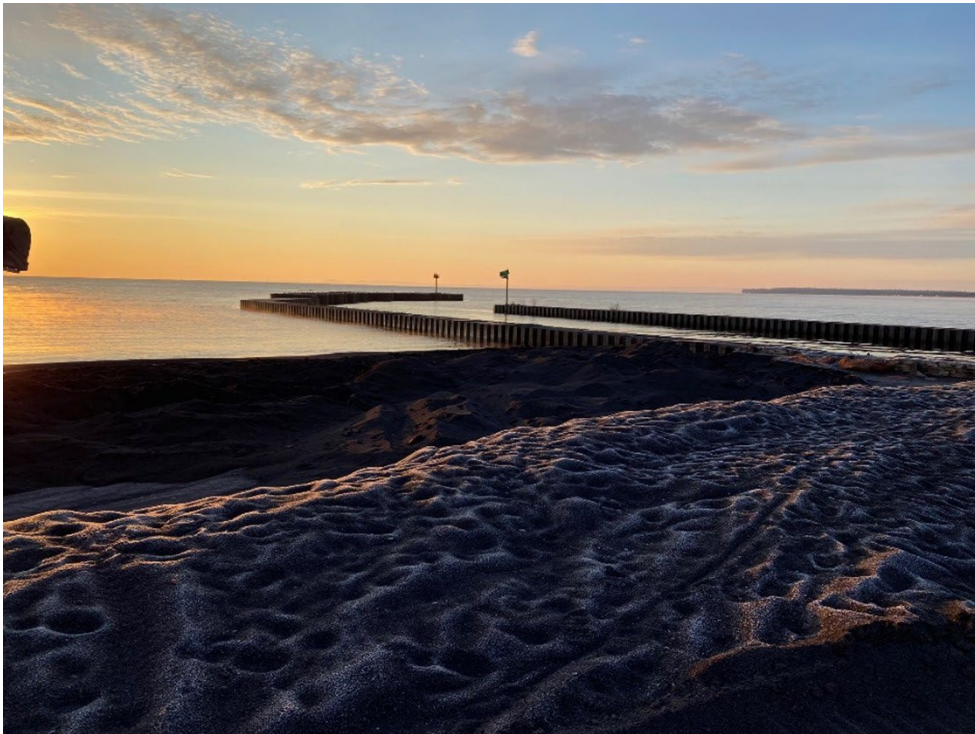


**Buffalo Reef Task Force Presents:
Buffalo Reef – Final Alternatives Analysis**

Real Estate Appendix
DRAFT JANUARY 2024



Appendix Overview

Buffalo Reef is a 2,200-acre cobble field with many aquatic organisms and critical spawning habitats for Lake Trout and Lake Whitefish located in Lake Superior adjacent to the Keweenaw Peninsula of Michigan. The reef is popular for anglers and has been closely connected to tribal fishers (commercial and subsistence) whose rights to fish within the reef have been observed since the Treaty of 1842. The reef and surrounding habitat are at risk of being inundated by an estimated 12.7 million cubic yards of copper-containing waste rock, known as stamp sands, from historic mining operations. In 2017, recognizing this issue is larger than what any single entity can accomplish on its own, the Environmental Protection Agency (EPA) endorsed the formation of a Buffalo Reef Task Force (BRTF) comprised of multiple state, federal, and tribal agencies. Since its formation, academic institutions and local government agencies have joined the team. The EPA directed USACE to prepare an engineering feasibility study to evaluate alternatives that reduce the impact stamp sands are having on Buffalo Reef and the associated juvenile fish recruitment area(s).

The purpose of this appendix is to discuss the real estate requirements associated with the project, as well as the estimated land values and costs associated with the acquisition of lands, easements, and rights-of-way, relocations, and disposal areas (LERRDs) required for construction, operation, and maintenance of the recommended plan. Additionally, this appendix identifies any facility/utility relocations necessary to implement the project. The final real property acquisition lines and real estate cost estimates provided herein are subject to change based on the final project design. The Real Estate Plan (REP), prepared in accordance with ER 405-1-12, supports the Planning Document titled, "Buffalo Reef - Final Alternatives Analysis". This Plan is tentative in nature, subject to change, and is preliminary for planning purposes only.

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1. Introduction

The project is authorized by the Economy Act 31 U.S.C. 1535. While there is currently no Non-Federal Sponsor for the project, it is anticipated that the State of Michigan will sign on as the Non-Federal Sponsor as the project progresses. For the purposes of this real estate plan, the assumption is that the State of Michigan is the sponsor and will acquire the necessary real estate interests for the project.

Buffalo Reef is a 2,200-acre whitefish and lake trout spawning habitat located in Lake Superior on the eastern side of the Keweenaw Peninsula in Michigan's Upper Peninsula. The reef provides a reliable fish harvest for many tribal, commercial, subsistence, and recreational fishermen. The reef is being inundated by an estimated twelve million cubic yards of stamp sands that are migrating towards the reef through littoral drift that were placed into Lake Superior during copper mining in the early 1900s. These historically placed stamp sands are toxic to aquatic life because of the metal concentrations (primarily copper).

The United States Environmental Protection Agency (EPA) endorsed the formation of a Buffalo Reef Task Force (BRTF) comprised of multiple state, federal, and tribal agencies. USEPA directed USACE to prepare an Engineering Feasibility Study to evaluate alternatives that reduce or eliminate the impact of stamp sands on Buffalo Reef and the associated juvenile fish recruitment area(s) as well as to provide for potential beach nourishment activities.

The recommended alternative includes dredging approximately 12.7 Million Cubic Yards of stamp sands from Lake Superior and placing it in the upland placement site. Existing Stamp sands near the Grand Traverse harbor stretch around 250-300 feet wide and the areas near the proposed Coal Dock Jetty are as wide as 750 feet. Pump stations and pipelines would be constructed to treat leachate originating from stamp sand that contacts precipitation within the upland placement site. The alternative also includes installation of a jetty and maintenance dredging during construction on the updrift side of Grand Traverse Harbor and the jetty. Construction roads are included to provide two-way roads for construction vehicles without impacting local traffic. Though all stamp sands are to be dredged, stamp sands updrift of the Coal Dock Jetty (CDJ) rests on bedrock, and consequently, approximately four inches will remain after dredging. The CDJ reduces the transport of stamp sands onto the reef by capturing it on the jetty's updrift side and would be removed during the construction and OMRR&R periods.

2. LERRD Required

Fee: 1425.3 Acres

The fee simple title to (the land described in Exhibit A) (Tracts Nos. 502-21-300-001, 502-22-102-001) Subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Road Easement: 54.54 Acres

A perpetual [exclusive] [non-exclusive] and assignable easement and right-of-way in, on, over and across (the land described in Exhibit A) (Tracts Nos. 501-30-101-000, 501-30-101-001, 501-30-101-002, 501-30-150-003, 501-30-350-001, 502-21-300-001, 502-22-102-001, 502-25-150-001, 502-25-150-002, 502-25-150-002, 502-25-150-003, 502-25-300-005, 502-25-300-006, 502-25-300-007-002, 502-25-300-008-001, 502-25-300-008-002, 502-25-400-009, 502-26-100-500, 502-27-100-500, 502-28-101-001, 502-35-150-001, 502-35-350-001) for the location, construction, operation, maintenance, alteration replacement of (a) road(s) and appurtenances thereto; together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the

right-of-way; (reserving, however, to the owners, their heirs and assigns, the right to cross over or under the right-of-way as access to their adjoining land at the locations indicated in Schedule B); subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Utility and/or Pipeline Easement: 0.53 Acres

A perpetual and assignable easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. 502-26-100-500), for the location, construction, operation, maintenance, alteration; repair and patrol of (overhead) (underground) (pump station and pipeline); together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Table 1. LERRD Required

Parcel ID	Estate	Acres	Ownership
502-21-300-001	Road Easement	2.75	Private
502-22-102-001	Road Easement	0.01	Private
502-26-100-500	Road Easement	8.5	Private
502-27-100-500	Road Easement	13.5	Private
502-28-101-001	Road Easement	0.13	Private
502-35-150-001	Road Easement	1.6	Private
502-35-350-001	Road Easement	1.6	Private
501-30-101-000	Road Easement	1.2	Private
501-30-350-001	Road Easement	5.5	Private
502-25-150-001	Road Easement	0.88	Private
502-25-150-002	Road Easement	0.9	Private
502-25-150-002	Road Easement	1.08	Private
502-25-150-003	Road Easement	0.97	Private
502-25-300-005	Road Easement	1.4	Private
502-25-300-006	Road Easement	2.78	Private
502-25-300-007-002	Road Easement	0.94	Private
502-25-300-007-001	Road Easement	0.83	Private
502-25-300-008-002	Road Easement	0.85	Private

502-25-400-009	Road Easement	3.24	Private
502-25-400-001	Road Easement	0.08	Private
502-35-150-001	Road Easement	5.8	Private
502-26-100-500	Utility Easement	0.53	Private
502-21-300-001	Fee	80.00	Private
502-22-102-001	Fee	160.00	Private
Bottomlands	Fee	1057.00	Public
502-35-150-001	Fee	67.8	Private
502-35-350-001	Fee	14.6	Private
502-35-350-001-001	Fee	7	Private
502-35-350-002	Fee	2	Private
502-35-350-003	Fee	2.2	Private
502-35-450-001	Fee	10.9	Private
502-35-450-002	Fee	7.9	Private
502-35-450-003	Fee	15.9	Private

Fee estate will be utilized for stamp sand removal and native sand renourishment, coal dock jetty construction, water treatment plant and pump stations and acquisition of upland placement site. The Coal Dock Jetty will be used as the permanent staging area to offload dredged material from scows into dump trucks that will haul the dredged material to the upland placement site. It will also be utilized as a collection point for stamp sands and deter continued movement of stamp sands updrift that are sitting on bedrock and cannot be entirely removed. Additionally, fee estate will be required for two pump stations along the footprint and any PL-91 646 relocations deemed necessary to support the project.

Two roads are proposed to support the construction of the project. Permanent road easements will be utilized for hauling material to the placement site from the coal dock jetty. The road easement from the coal dock jetty to City of Gay will be used as a route to exit or enter from the coal dock jetty to reduce 2 way traffic and just have a traffic loop for all the trucks to follow to the placement area.

Two pump stations and a pipeline running from Lake Superior to upland placement site is required. Precipitation would accumulate within placement site and the leachate from the contact with the stamp sands would require dilution prior to discharge into Lake Superior. Once the leachate has been diluted, the water would discharge back to Lake Superior via a gravity-fed outlet pipe.

3. Sponsor-Owned Land

There is currently no sponsor for this project. However, it is anticipated that the State of Michigan will sign on as the Non-Federal Sponsor for the project. A preliminary review shows that the stamp sands are considered bottomlands of Lake Superior with the State of Michigan holding this land in trust for the people of Michigan. In order to confirm, extensive title work will be completed in the next phase of the project.

4. Non-Standard Estates

If it is determined through title work that the State of Michigan owns the bottomlands and they join as project sponsor no non-standard estates will be required to complete the project.

5. Existing Federal Projects

Grand Traverse Bay Harbor is located adjacent to the project footprint on the south shore of Lake Superior, at the mouth of the Traverse River on the eastern shore of Keweenaw Bay, about 20 miles northeasterly from the Portage Entry to the Keweenaw Waterway. The project was authorized by the River and Harbor Act of 1945 and provides for two parallel pier, the north pier 871 feet long and the south pier 567 feet long; for an entrance between the piers 50 feet wide and 12 feet deep; and for a harbor basin of 10 feet for a maximum width of 200 feet and a maximum width of 200 feet was built to a width of 175 feet. The harbor services primarily commercial fishing and recreational navigation interests. The Harbor is operated and maintained by the USACE. The State of Michigan is the Non-Federal Sponsor for this project and has the responsibility to provide all LERRDS necessary to operate and maintain the project.

6. Federal-Owned Land

The United States Federal Government is currently in possession of 2 permanent easements located within the project area. These 2 easements were donated to the Federal Government by Calumet and Hecla Consolidated Copper Company in 1949 for the purposes of completing the Grand Traverse Bay Harbor Improvement Project which was authorized by the Rivers and Harbors Act of 2 March 1945. The first easement is a 4.2 acre right of way directly north of the navigation channel to aid in the operations and maintenance of the harbor. The second easement is a .9 acre spoil disposal area directly south of the navigation channel for the placement of dredged material.

7. Navigation Servitude

Navigation Servitude will not be utilized for this project.

8. Project Locations And Maps

The project area is located in both Houghton County and Keweenaw County in the State of Michigan's Upper Peninsula. The project area is bordered by the City of Gay, Michigan to the North, Big Traverse Bay to the South, and Lake Superior to the East. The project's location is on the coast of Lake Superior and is mostly rural with large amounts of heavily forested land. A selection of roads in the area include Lake Linden Gay Road, Rice Lake Road, and Gay Park Road. Maps outlining the project area can be found in Exhibit A.

9. Induced Flooding

No induced flooding is anticipated with this project.

10. Baseline Cost Estimate

In the absence of an appraisal product completed by a certified professional, a placeholder value of \$30,000,000.00 is being utilized to account for the LERRD required for the project. The estimated value of LERRD is a preliminary placeholder which may decrease or increase upon completion of an appraisal. An appraisal will be completed in the next phase of the project prior to acquiring real estate.

11. Relocation Assistance Benefits (P.L. 91-646)

It is anticipated that multiple landowners may need to be relocated in order to complete this project. Currently, it is anticipated that some properties within the project footprint may be relocated. Costs for relocations will be included in the LERRD cost once more information is received in the next phase of the project.

12. Mineral/Timber Activity

No mineral or timber activity is anticipated with this project. It is assumed that the timber on the upland sites will be removed prior to acquisition by the current owners.

13. Sponsor Capability

There is currently no Non-Federal Sponsor for this project. However, it is anticipated that the State of Michigan will sign on as a sponsor and that they have acquisition capabilities but the details are to be determined as the project moves forward.

14. Zoning

No zoning issues are anticipated for this project.

15. Schedule

Table 2. Schedule

Activity	Timeframe
Project Partnership Agreement Signed by NFS	Day 0
Real Estate Map Complete	PPA Agreement + 1 Month
Notice to Acquire Sent To NFS	Real Estate Map + 2 Weeks
NFS Begins Acquisition	Notice to Acquire + 2 Weeks
Real Estate Acquisition Complete	NFS Begins Acquisition + 36 Months
Certification of Real Estate	Real Estate Acquisition Complete + 1 Month
Construction Contract Ready To Advertise Date	Certification of Real Estate + 1 Week
Total	39 Months + 1 Week

It is anticipated that the recommended alternative project construction duration is likely to be greater than 100 years. This includes implementation and dredging to remove the stamp sands in their entirety.

16. Utility/Facility Relocations

It is anticipated that there may be septic tanks/fields in the existing stamp sands. An attorney's opinion regarding the septic tanks/fields will be completed after more information is gathered. Further, the attorney's opinion will determine whether or not the septic tanks/fields have a compensable interest.

Any conclusion or categorization contained in this report that an item is a utility or facility relocation to be performed by the nfs as part of its lerrd responsibilities is preliminary only. The government will make a final determination of the relocations necessary for the construction, operation, or maintenance of the project after further analysis and completion and approval of final attorney's opinions of compensability for each of the impacted utilities and facilities.

17. Environmental Considerations

Over the years, numerous studies have been conducted on the toxicity of stamp sands. Stamp sand is known to contain heavy metals at concentrations that pose an unacceptable risk to aquatic organisms. Stamp sand concentrations of copper Cu are high, averaging 10 to 100 times greater than other regional source materials or natural sediments. Copper concentrations in groundwater, pond water, and elutriate water exceeded MDEQ Rule 57 Water Quality Values.

The environmental evaluation was conducted of implementing the proposed stamp sand excavation/dredging activities with placement/containment at an Upland Placement Site. Project implementation would not result in significant cumulative or long term adverse environmental effects. The project would cause minor adverse impacts to cultural resources and potentially wetlands which will likely require mitigation. Project implementation with appropriate safeguards would not be injurious to the public interest. Adverse effects are minor, including noise and air emissions from equipment

operation, temporary turbidity from construction operations, temporary displacement of fish, destruction of any bottom-dwelling organisms in the immediate work area, and modification of shoreline through the removal of the stamp sands. Use of the Upland Placement Site would result in the removal of 25 acres of wetlands but wetland mitigation, if required, will reduce any identified adverse wetland impacts.

The evaluation determined that the placement site is ecologically viable for implementation provided funding is secured for implementation. The project would be beneficial in preventing further stamp sand encroachment onto Buffalo Reef, stamp sand filling of the Grand Traverse Bay Harbor that provides shelter from storm events for boats on the open lake, and the prevention or minimization of stamp sands migration to the native beaches located south of the harbor. Implementation of either of the large dredging/excavation restoration alternatives results in 818 to 1,118 acres of Lake Superior bottomlands being restored, which far outweigh impacts of project implementation.

18. Project Support and Owner Attitude/Issues

Overall, the public is supportive of the project purpose. However, because of the large project footprint, there may be landowner concerns associated with the removal of the stamps sands.

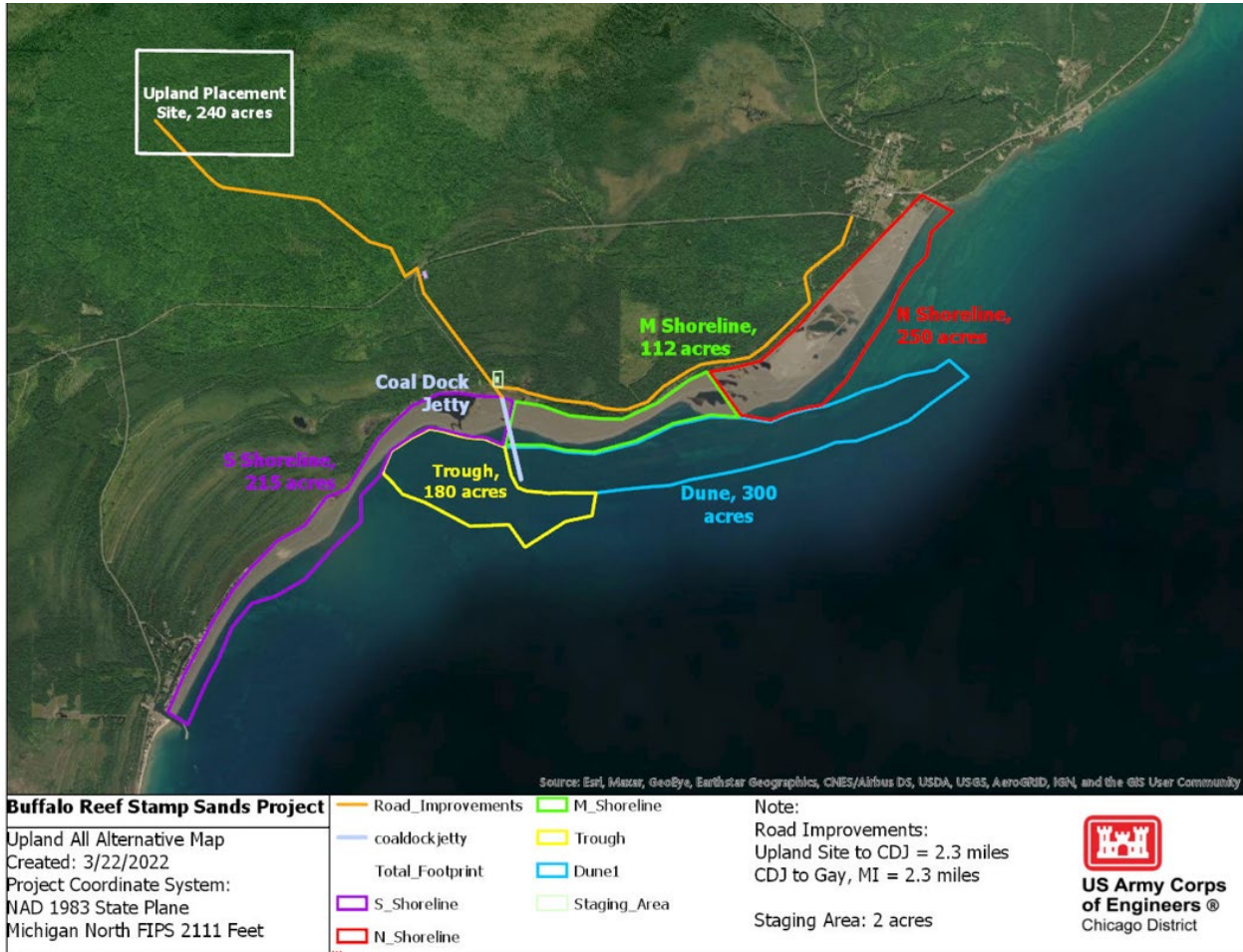
19. Other Relevant Real Estate Issues

There are no cemeteries within the Project area. No special aquatic sites are impacted by the project. Approximately 25 acres of wetlands would be impacted during construction of the roads, water treatment facilities, and the permitted disposal facility. For every 1 acre of wetland impacted, 1.5 acres shall be mitigated. A formal wetland delineation survey should be completed during project design. Project sponsors may decide to preserve threatened wetlands in lieu of mitigating with constructed wetlands with an assumed ratio of 10:1.

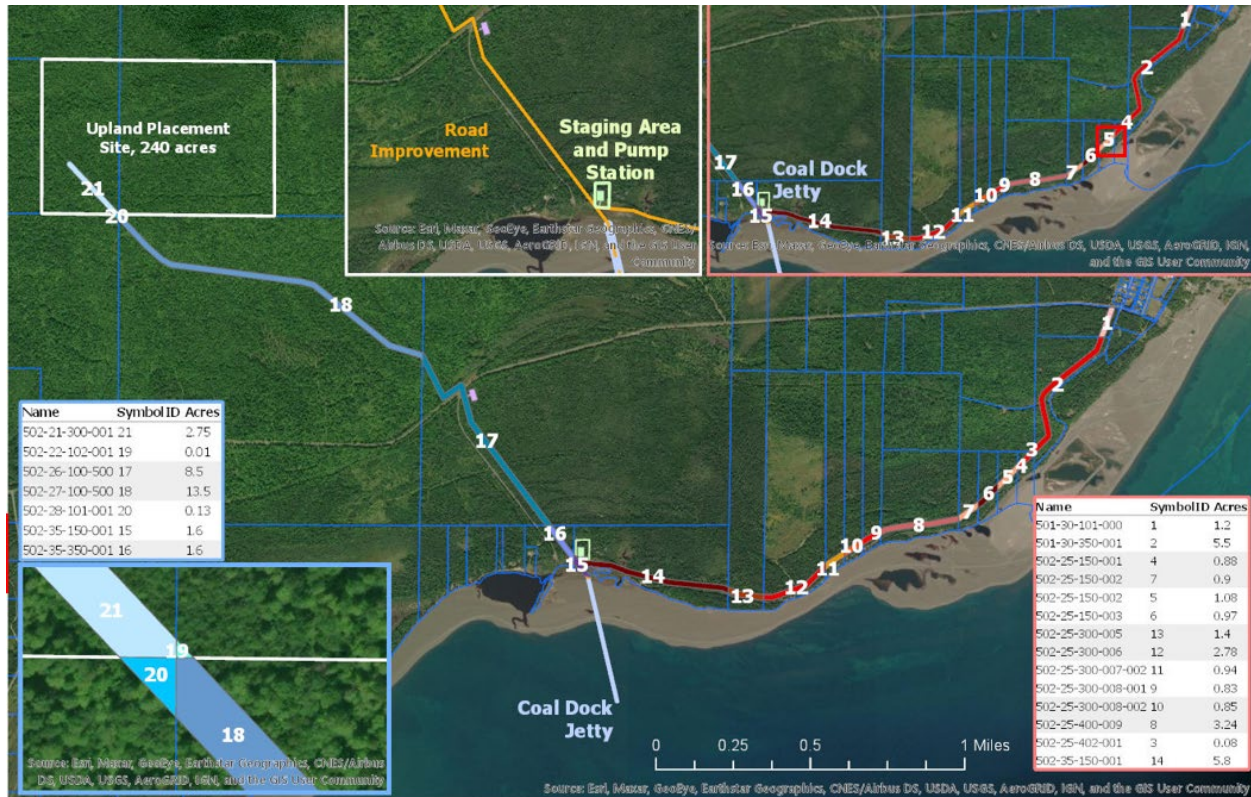
The Detroit District Real Estate Division will coordinate, monitor, and assist with all real estate activities undertaken by the non-Federal Sponsor. If any acquisition activities are required by the non-Federal Sponsor, the Real Estate Division will assure that the acquisition process is conducted in compliance with Federal and State Laws, specifically, the requirements under the Federal Uniform Relocation and Acquisition Act (P.L. 91-646). The Real Estate Division will attend district team meetings, and also review and provide input into draft and final reports prepared by the district team.

Exhibit A

Overall Project Area Map



Project Footprint and Parcel Map



Name	SymbolID	Acres
502-21-300-001	21	2.75
502-22-102-001	19	0.01
502-26-100-500	17	8.5
502-27-100-500	18	13.5
502-28-101-001	20	0.13
502-35-150-001	15	1.6
502-35-350-001	16	1.6



Name	SymbolID	Acres
501-30-101-000	1	1.2
501-30-350-001	2	5.5
502-25-150-001	4	0.88
502-25-150-002	7	0.9
502-25-150-002	5	1.08
502-25-150-003	6	0.97
502-25-300-005	13	1.4
502-25-300-006	12	2.78
502-25-300-007-002	11	0.94
502-25-300-008-001	9	0.83
502-25-300-008-002	10	0.85
502-25-400-009	8	3.24
502-25-402-001	3	0.08
502-35-150-001	14	5.8

Buffalo Reef Stamp Sands Project

Road Improvements Map
 Created: 3/22/2022
 Project Coordinate System:
 NAD 1983 State Plane
 Michigan North FIPS 2111 Feet

Water Treatment Facilities

- 502-26-100-500
- 502-35-150-001
- Staging_Area

NOTE: Water Tank (purple) and Pump Station (green) require 0.53 acres each. Staging area is 2 acres.
 - 2.3 miles from Upland Site to Coal Dock Jetty
 - 2.3 miles from CDJ to Gay, MI
 *Parcel 5 "Offer-to-Buy" Property - only parcel with structure onsite.
 *Assume each road requires 100ft ROW



US Army Corps of Engineers
 Chicago District

20. Acronyms

Bete Grise (BSG)

Big Bay (BIG)

Buffalo Reef Task Force (BRTF)

Catch Per Effort (CPE)

Centers for Disease Control (CDC)

Clean Water Act (CWA)

Coal Dock Jetty (CDJ)

Coastal Barrier Resources Act (CBRA)

Council on Environmental Quality (CEQ)

Cubic Yards (CY)

Department of Natural Resources (DNR)

Ecosystem Service Valuation (ESV)

Engineer Research and Development Center (ERDC)

Engineering Regulation (ER)

Environment, Great Lakes, and Energy (EGLE)

Executive Orders (EOs)

Grand Traverse Bay (GTB)

Great Lakes District, Buffalo (LRB)

Great Lakes District, Chicago (LRC)

Great Lakes District, Detroit (LRE)

Great Lakes Fishery and Ecosystem Restoration (GLFER)

Great Lakes Fishery Commission (GLFC)

Great Lakes Indian Fish and Wildlife Commission (GLIFWC)

Great Lakes National Program Office (GLNPO)

Great Lakes and Ohio River Division (LRD)

Great Lakes Regional Collaboration (GLRC)

Great Lakes Restoration Initiative (GLRI)

Great Lakes Water Quality agreement (GLWQA)

Great Sand Bay (GSB)

Hydrology and Hydraulics (H&H)

Information for Planning and Consultation (IPAC)

Indigenous Traditional Ecological Knowledge (ITEK)

Keweenaw Bay Indian Community (KBIC)
Keweenaw County Road Commission (KCRC)
Lakewide Action and Management Plan (LAMP)
Light Detection and Ranging (LIDAR)
Little Traverse Bay (LTB)
Michigan Technological University (MTU)
Million Cubic Yards (MCY)
Million Gallons per Day (MGD)
National Ambient Air Quality Standards (NAAQS)
National Environmental Policy Act (NEPA)
National Register of Historic Places (NRHP)
National Water Research Institute (NWRI)
Native Sands (NS)
No Observable Effects Concentrations (NOECs)
Non-Federal Sponsor (NFS)
Northern Long-Eared Bat (NLEB)
Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R)
Parts Per Million (ppm)
Probable Effects Concentrations (PEC)
Project Delivery Team (PDT)
Stamp Sands (SS)
State of Michigan (SOM)
Suspended Particulate Phase (SPP)
Acute Toxic Units (TUa)
Unified Soils Classification System (USCS)
Upland Placement – Small (Upland-SM)
Upland Placement – Medium (Upland-Medium)
Upland Placement – All (Upland-All)
Unified Soils Classification Systems (USCS)
U.S. Army Corps of Engineers (USACE)
U.S. Environmental Protection Agency (EPA)
U.S. Fish and Wildlife Service (FWS)
U.S. Geological Survey (USGS)

White Pine Mine (WPM)

Young of the Year (YOY)