



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
SR-6J

2021-07-07

(via email only)

Linda B. Albrecht
Department of the Army
Army Environmental Command
ATTN: MAIL STOP 112, IMAE-E
2455 Reynolds Road
JBSA Fort Sam Houston, TX 78234-7588

Re: EPA and MPCA TCAAP Federal Facility Consistency Test Approval for the Proposed Plan for TCAAP-31 Round Lake, Submitted July 7, 2021; New Brighton/Arden Hills/TCAAP NPL Site; Arden Hill, Minnesota

Dear Ms. Albrecht,

The United States Environmental Protection Agency (EPA), in consultation with the Minnesota Pollution Control Agency (MPCA), has completed a review of the Proposed Plan, submitted July 7, 2021, for TCAAP-31 Round Lake, prepared for the New Brighton/Arden Hills/TCAAP NPL Site, in Arden Hills, Minnesota. This letter documents both the EPA and the MPCA's determination that, following review, the Proposed Plan for TCAAP-31 Round Lake submitted July 7, 2021 passes the Consistency Test in accordance with Chapter XIV of the TCAAP Federal Facility Agreement.

Please publish the Proposed Plan for TCAAP-31 Round Lake and initiate the public comment period within 30 days of EPA and MPCA's joint Consistency Test approval of the Proposed Plan.

If you have any questions or concerns, please contact me via email at patel.viral@epa.gov or via telephone at (312) 886 6943.

Sincerely,

X Viral Patel

Viral Patel
Remedial Project Manager
Signed by: VIRAL PATEL

cc: *(via email only)*
Brigitte Hay, MPCA



**PROPOSED PLAN
for TCAAP-31 Round Lake**

**New Brighton/Arden Hills/Twin Cities Army Ammunition Plant
Superfund Site
Ramsey County, Minnesota
FINAL**

DATES TO REMEMBER

Public Comment Period: July 9 through August 13, 2021
The Army will accept written comments on this Proposed Plan by letter or email during the public comment period. See page 24 of this Proposed Plan for contact information and the location of the Administrative Record file.

Public Meeting: July 20, 2021
The Army will hold a virtual public meeting to explain this Proposed Plan and the remedial alternatives evaluated in the Supplemental Remedial Investigation and Feasibility Study (SRI/FS) and to receive input from the community. Oral and written comments will be accepted at the meeting. The meeting will begin at 7 p.m. in conjunction with the Restoration Advisory Board (RAB) meeting. See page 24 of this Proposed Plan for more information.

This *Proposed Plan*, part of the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) process (Figure 1), identifies the U.S. Army’s proposed remedy for TCAAP-31 Round Lake (Round Lake) at the New Brighton/Arden Hills/Twin Cities Army Ammunition Plant (NB/AH/TCAAP) Superfund Site. The NB/AH/TCAAP Superfund Site, which includes the former *Twin Cities Army Ammunition Plant* (TCAAP), is located in Arden Hills, Minnesota (Figure 2).

Round Lake was formerly considered part of TCAAP. Round Lake was transferred to the U.S. Fish and Wildlife Service (USFWS) in 1974 and USFWS later incorporated Round Lake into its national wildlife refuge (NWR) system as a unit of the Minnesota Valley NWR in 1980.

This Proposed Plan identifies the Army’s *preferred alternative* for achieving the *remedial action objective* (RAO) to address metals-contaminated sediments in Round Lake and provides the rationale for this preference.

Figure 1. Progression of the CERCLA Process



The Army's preferred alternative is Alternative 4, Option A (4A): Dredging, Dewatering, and Disposal Offsite, which includes dredging contaminated sediments, transferring dredged sediments to an upland processing area for dewatering and stabilization, and disposal of processed sediments at an offsite landfill.

This Proposed Plan summarizes results of investigation activities, risk assessments, and evaluation of remedial alternatives that can be found in greater detail in the Supplemental Remedial Investigation/ Feasibility Study (SRI/FS), and other documents contained in the *Administrative Record*.

Site documents are available for public review in the Administrative Record File and Information Repository at the Minnesota Army National Guard, Arden Hills Army Training Center, 4761 Hamline Ave N, Arden Hills, Minnesota. Please call (651) 282-4420 for an appointment and directions. Some of the documents from the Administrative Record are also available online at: <https://tcaaprab.org/resources/>.

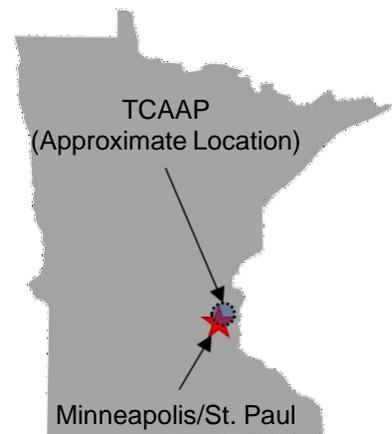
The Army is issuing this Proposed Plan as part of its public participation responsibilities under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and CERCLA Section 117(a). All remedial actions are subject to the provisions of the Federal Facility Agreement (1987) among the Army, U.S. Environmental Protection Agency (USEPA), and Minnesota Pollution Control Agency (MPCA). The Army is the lead agency responsible for environmental cleanup of the NB/AH/TCAAP Superfund Site, under the oversight of the USEPA and MPCA. This Proposed Plan was prepared in consultation with the USEPA and the MPCA.

After reviewing and considering input submitted during the 30-day public comment period, the Army and USEPA, in consultation with the MPCA, will select the final remedy and document the decision through a *Record of Decision* (ROD). The public is encouraged to review and comment on the preferred alternative and the rationale provided for this preference, and all other presented remedial alternatives summarized in this Proposed Plan and presented in detail in the SRI/FS. The Army and the USEPA, in consultation with the MPCA, may modify the proposed cleanup plan or may select another remedial alternative, based on new information or public comments received during the public comment period.

SITE BACKGROUND

The NB/AH/TCAAP Superfund Site consists of a 25-square mile area located in Ramsey County, Minnesota. This includes the approximately 4-square mile area of the original TCAAP facility and portions of seven nearby communities: New Brighton, Arden Hills, St. Anthony, Shoreview, Mounds View, Columbia Heights, and Minneapolis. TCAAP was constructed in 1941 to produce small-caliber ammunition for the U.S. military. Production activities included manufacturing small arms ammunition and related materials, proof-testing small arms ammunition and related items as required, and handling and storing strategic and critical materials for other government agencies. Ammunition production and related activities occurred periodically, commensurate with operations in wars, conflicts, and other national emergencies, and ceased in 2005.

Figure 2. Approximate Location of TCAAP



In 1983, the NB/AH/TCAAP Superfund Site was put on the *National Priorities List* (NPL) because USEPA and MPCA determined that hazardous substances from TCAAP had been released into the environment. Figure 3 shows the location of TCAAP and its boundary in 1983. Since placement on the NPL in 1983, control of more than 1,500 acres has been reassigned to the National Guard Bureau and U.S. Army Reserve. This property is still federally owned and controlled by the Army, but is no longer considered part of TCAAP. The property controlled by the National Guard Bureau has in turn been licensed to the Minnesota Army National Guard and is called the Arden Hills Army Training Site (AHATS). Other former TCAAP property has transferred out of federal ownership to Ramsey County and the City of Arden Hills. The majority of the remaining TCAAP property that was controlled by the Base Realignment and Closure Division of the U.S. Army was transferred to Ramsey County in 2013 for redevelopment.

Round Lake is no longer part of the TCAAP area and receives stormwater from a portion of the former installation area. In the early 1940s, Round Lake and the surrounding shoreline were acquired by the U.S. government to make it part of the original TCAAP. Round Lake was transferred to the USFWS in 1974 and USFWS incorporated Round Lake into its national wildlife refuge system later as a unit of the Minnesota Valley NWR. Round Lake and the shoreline are currently owned by USFWS.

Figure 3. Round Lake Relative Location to TCAAP



SITE CHARACTERISTICS

Round Lake is located south-west of the former TCAAP area, in the southwest corner of the intersection of Highway 10 and Highway 96. Figure 4 shows the lake location, along with property parcel boundaries. Round Lake consists of approximately 154 acres of shoreline and lake. Sediment is the only contaminated media present in Round Lake. *Chemicals of Concern* (COCs) for Round Lake sediments include seven metals (cadmium, chromium, copper, lead, silver, vanadium, and zinc) and polychlorinated biphenyls (PCBs). Investigation results show that contamination is largely confined to the upper one foot of sediment. The metals contamination is more extensive than the PCB contamination, with the PCB contamination generally contained within the metals-contaminated areas.

USFWS has an easement for an entrance road to the outlet structure at the southeast corner of Round Lake. When Round Lake was first acquired by the U.S. Government, the surrounding land use was primarily agricultural. During Army control, significant urbanization occurred with development of the surrounding communities of Arden Hills and New Brighton.

This growth also brought major transportation arteries including Interstate Highway 694 to the south, Highway 10 to the east, Highway 96 to the north, and Interstate Highway 35W to the west. The

Figure 4. Round Lake Vicinity Map



current land-use surrounding Round Lake ranges from residential to industrial, along with the major roadways.

Round Lake received industrial processing wastewater, sanitary sewer, and storm sewer discharges from TCAAP. There are three inlets to Round Lake that acted as potential conveyances of water from the former TCAAP area. The first is a former overflow sewer that served as an emergency backup to the TCAAP sanitary sewer from 1942 to 1991, when it was disconnected from TCAAP. The second inlet is a culvert beneath Highway 96 that conveys surface drainage from the Arden Manor Manufactured Home Community, located north of Round Lake, which in turn gets some surface drainage from a small portion of the former TCAAP area (Figure 5). No potential sources of contamination have been identified on this particular portion of the former TCAAP area.

The third inlet is a storm sewer that conveys stormwater from the southwest corner of the former TCAAP area, as shown on Figure 5. In the past, this storm sewer also received industrial waste; hence, it is the pathway for the historical release of hazardous substances from the former TCAAP area into Round Lake. Industrial discharges from industrial facilities at TCAAP to Round Lake occurred between the early 1940s and late 1960s.

A reconstruction of the intersection of Highway 10 and Highway 96 was completed in 2014, which altered some of the stormwater piping/routing in this vicinity. Ramsey County removed the old TCAAP storm sewer that was located within property that was acquired from the Army in 2013.

SCOPE AND ROLE OF THE ACTION

The source of contamination to Round Lake has been eliminated. TCAAP is no longer in operation and therefore industrial discharges to the storm sewer no longer occur. Much of the storm sewer drainage to Round Lake has been eliminated with Ramsey County's removal of the TCAAP storm sewer system within their property. The Army's strategy for remediating Round Lake is to remove sediment with concentrations of COCs above the target cleanup goal and transfer the sediment offsite for disposal. This proposed remedial action is intended to be the final remedial action to address unacceptable risks to human health and the environment at Round Lake.

SUMMARY OF SITE RISKS

The *Human Health Risk Assessment* (HHRA) completed for Round Lake concluded no unacceptable risks to potential human receptors and the Supplemental *Ecological Risk Assessment* (ERA) found that there was no unacceptable risk to piscivorous species and aquatic animals (SRI/FS Appendix B). As discussed in the Supplemental ERA, the contaminated sediments have potentially adverse effects to benthic macroinvertebrates and the waterfowl that ingest them.

COCs for Round Lake sediments include seven metals (cadmium, chromium, copper, lead, silver, vanadium, and zinc) and PCBs. Investigation results show that contamination is largely confined to the upper one foot of sediment. The metals contamination is more extensive than the PCB contamination, with the PCB contamination generally contained within the metals-contaminated areas. The HHRA evaluated current and future conditions for mixed residential and commercial land use. The exposed population evaluated in the HHRA was local residents. The exposure pathways were dermal contact with surface water and sediment, incidental ingestion of surface water, and ingestion of fish. An additional evaluation was performed for ingestion of sediment.

Extensive risk assessment work has been conducted for Round Lake to evaluate risks to human and ecological receptors. The HHRA concluded that human exposure to Round Lake surface water and sediment presents no unacceptable risks. Additional evaluation comparing the 2011 sediment data to

Minnesota Department of Health (MDH) Sediment Screening Values and comparing the 2012 Minnesota Department of Natural Resources fish testing results for PCBs to MDH fish consumption advisory levels shows that the Round Lake COCs (metals and PCBs) do not represent a risk to the public or workers, including ingestion of PCBs through consumption of fish.

The Supplemental ERA indicates there is no unacceptable risk through direct or indirect exposure to species inhabiting or utilizing the surface water body, including algae, aquatic invertebrates, fish, amphibians, and piscivorous birds and mammals. Potential risk is primarily for the *benthic invertebrates*. The Supplemental ERA indicated a potential minimal risk to mallards from lead concentrations in sediment at a few locations in the lake.

The MPCA uses *mean probable effect concentration quotient* (mPEC-Q) to predict toxic effects to sediment-dwelling organisms when there is a mixture of contaminants and contaminant classes. The Level I *sediment quality target* (SQT) for the mPEC-Q is the level at which toxic effects are unlikely. The Level II SQT for the mPEC-Q is the level at which toxic effects are likely. The Level I SQT is set at a mPEC-Q of 0.1. However, for Round Lake, the Level I SQT was adjusted upward to 0.35 to account for naturally occurring background levels of some metals in the sediment of Round Lake. The Level II SQT is set at a mPEC-Q of 0.6.

The MPCA considers the Level II mPEC-Q as appropriate for use as a remedial target level at sediment contamination sites in Minnesota when the goal is to reduce the potential for acute toxicity and where natural recovery processes are expected to further reduce contaminant concentrations over time. The MPCA uses SQTs as the primary basis for setting remedial action targets when other lines of toxic effects evidence in a SQT approach (e.g., site-specific toxicity testing and benthic community analysis) are either incomplete or are of unacceptable quality to the MPCA. The Army's comprehensive evaluation of contaminant concentrations in Round Lake sediment created a robust sediment chemistry dataset that allows a meaningful comparison to the SQTs and provides a reasonable basis for setting a remedial target level at Round Lake.

Figures 6 through 9 show the sediments exceeding the mPEC-Q target level of 0.6 for metals at depths of 0 to 0.5 foot, 0.5 to 1.0 foot, 1 to 2 feet, and 2 to 3 feet below the sediment surface (bss). mPEC-Q results deeper than 3 feet bss are less than 0.6.

It is the Army's current judgement that the preferred alternative in this Proposed Plan is necessary to address contaminated sediment that could pose an unacceptable risk to the benthic invertebrates and the waterfowl that consume them at Round Lake.

Figure 5. Round Lake Watersheds



Figure 6. Metals mPEC-Q Results for 0 to 0.5 feet bss

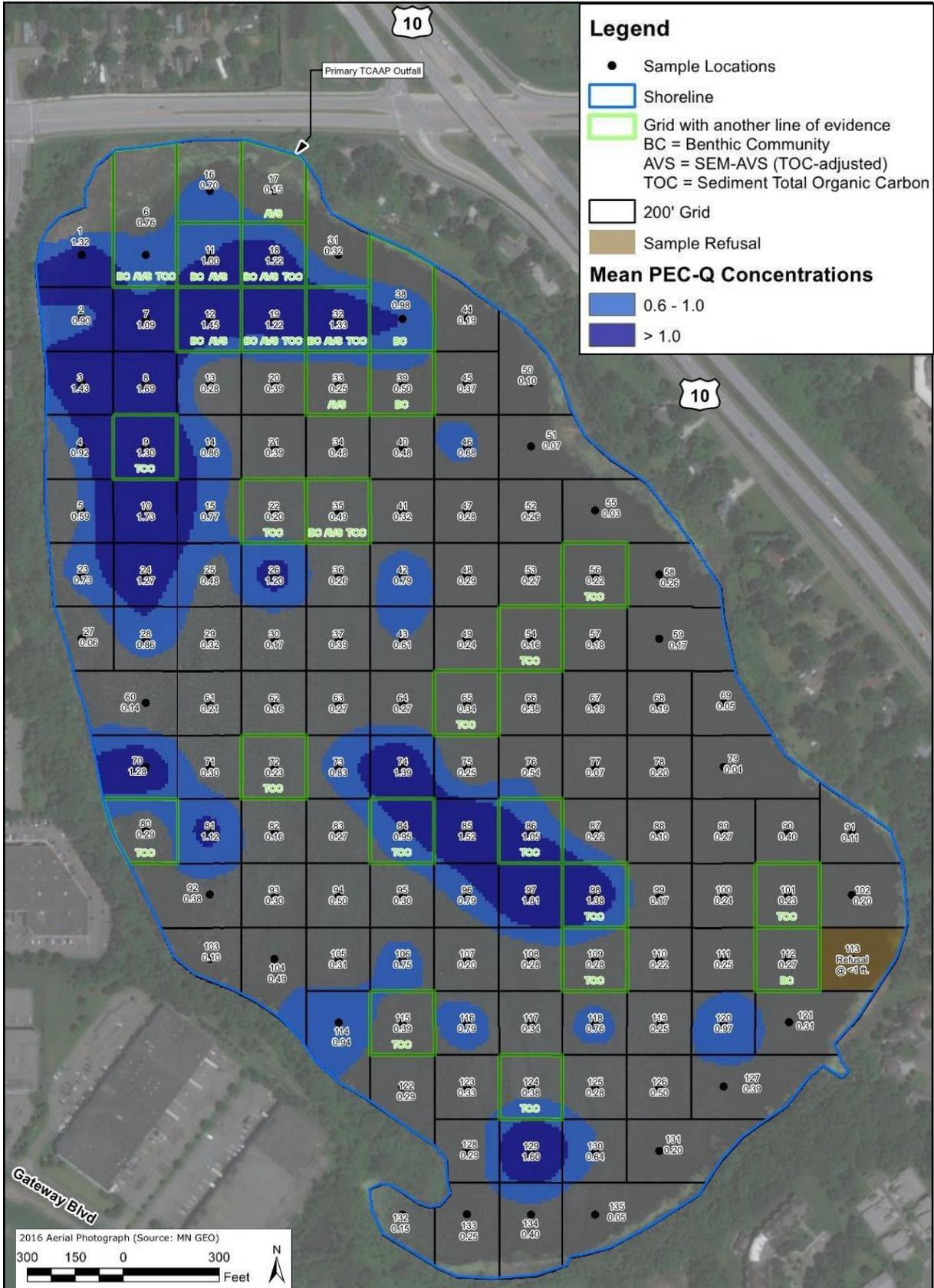


Figure 7. Metals mPEC-Q Results for 0.5 to 1.0 feet bss

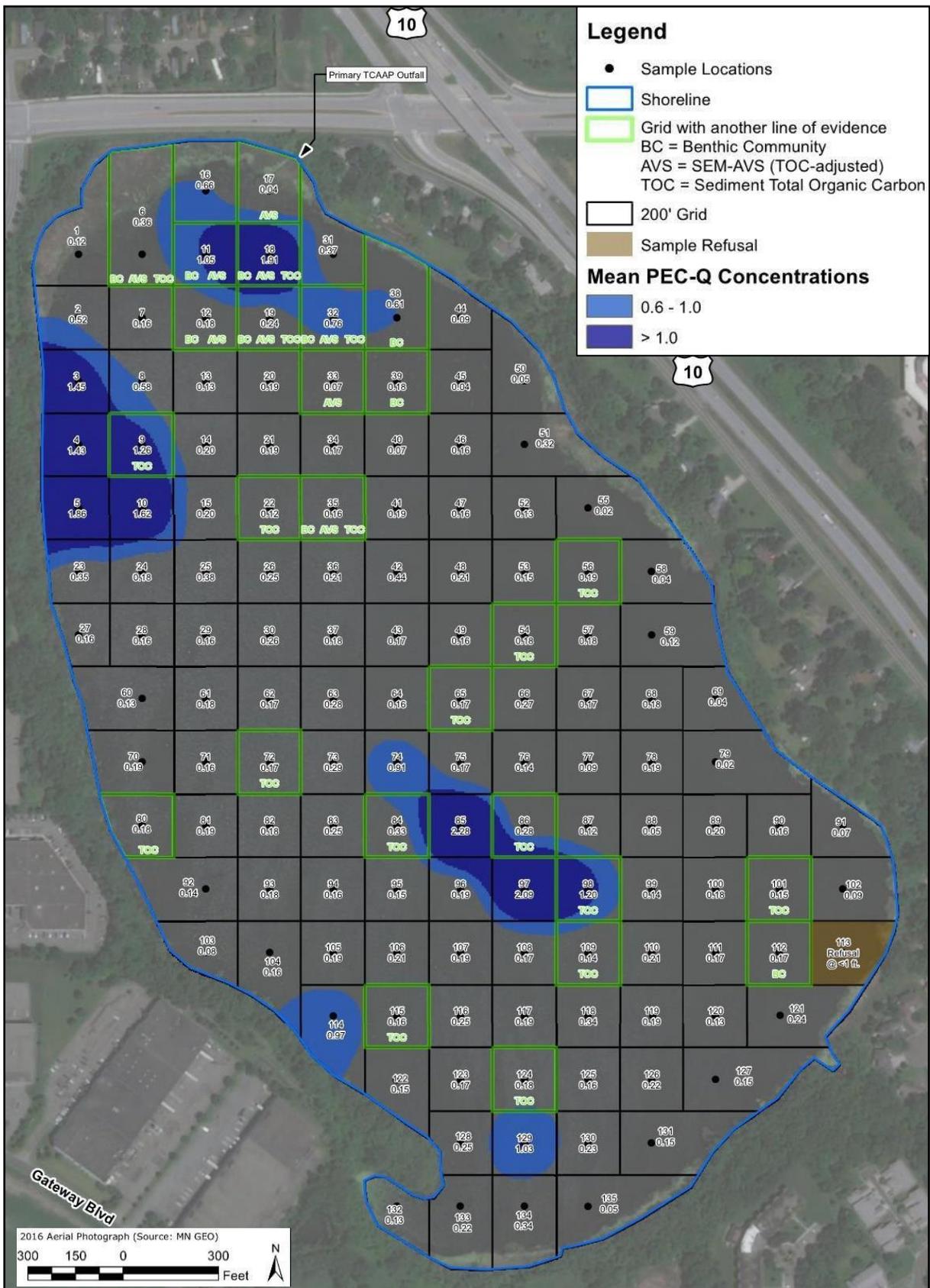


Figure 8. Metals mPEC-Q Results for 1 to 2 feet bss

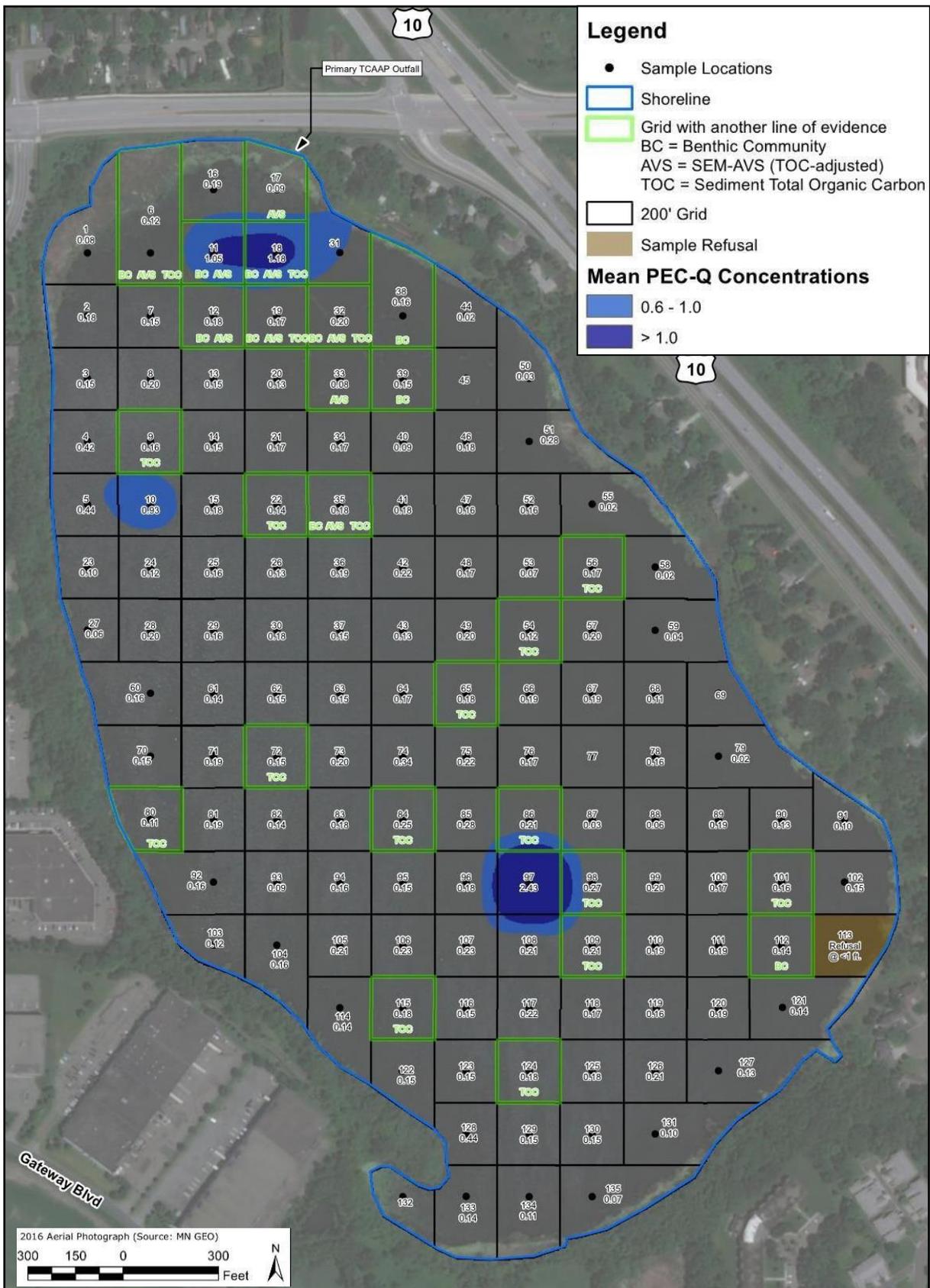
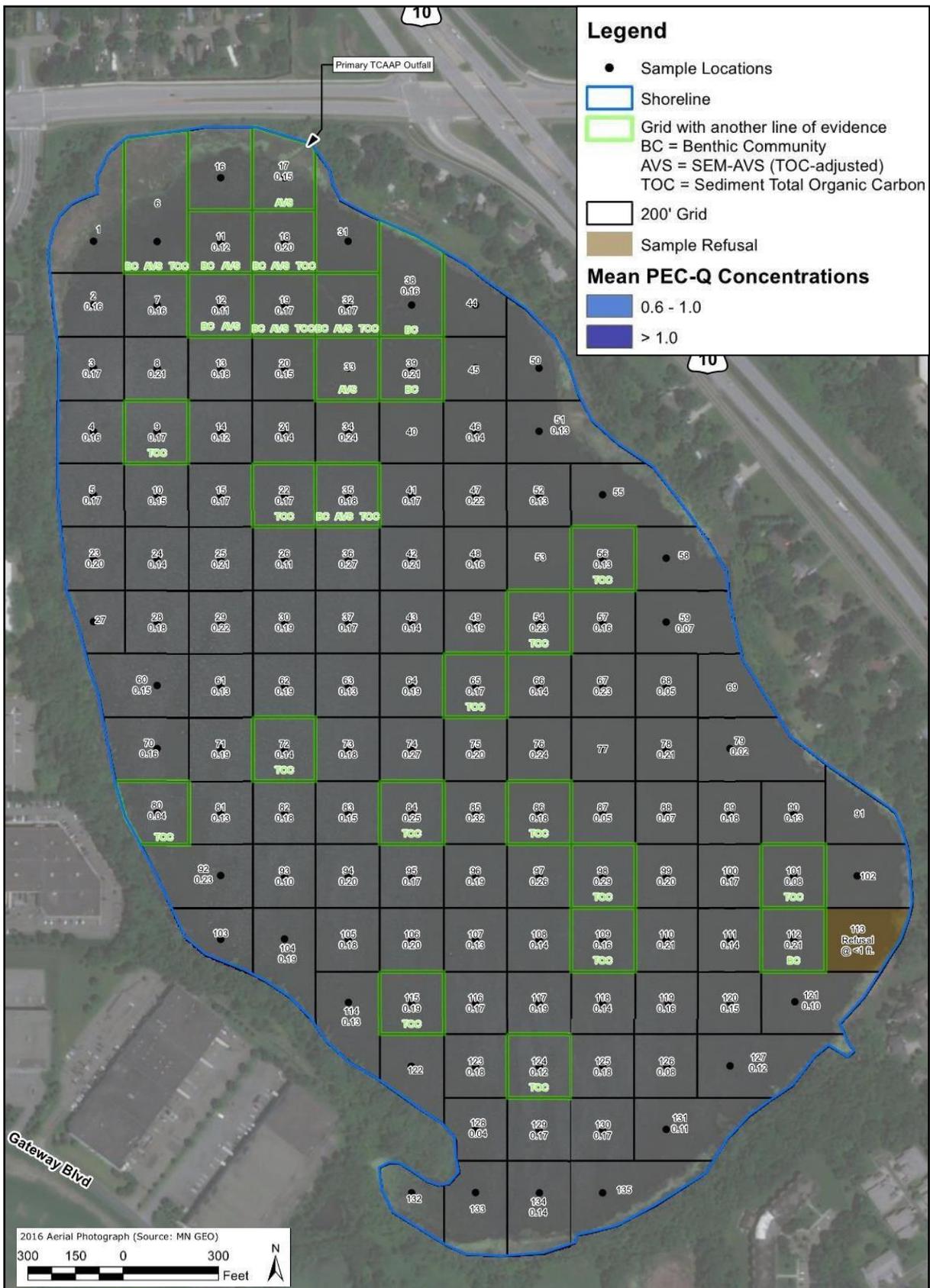


Figure 9. Metals mPEC-Q Results for 2 to 3 feet bss



REMEDIAL ACTION OBJECTIVES

The following RAO was developed based on consideration of the contaminant levels and exposure pathways found to present potentially unacceptable risk to the environment, as described in the SRI/FS. The RAO established in the SRI/FS is to minimize the potential for adverse effects to benthic populations and the waterfowl that ingest them from exposure to the contaminated sediments from TCAAP-related discharges by achieving a mPEC-Q of 0.6.

SUMMARY OF ALTERNATIVES

The potential *alternatives* evaluated in the SRI/FS are listed below. They are further explained later in this document and in greater detail in the SRI/FS.

- Alternative 1: No Action
- Alternative 2: Monitored Natural Recovery
- Alternative 3: Enhanced Monitored Natural Recovery
- Alternative 4: Dredging, Dewatering, and Disposal Offsite (Option A; 4A) or at TCAAP (Option B; 4B). Alternative 4A is the preferred alternative.
- Alternative 5: In-Situ Cover
- Alternative 6: Dredging, Dewatering, and Offsite Disposal of Sediment (Option A; 6A) or at TCAAP (Option B; 6B) and In-situ Cover of Remaining Sediment Above the Selected Target Level
- Alternative 7: Dredging and Near-Shore *Confined Aquatic Disposal* (CAD) of Sediment within Round Lake
- Alternative 8: Dredging and Deep Water CAD of Sediment within Round Lake
- Alternative 9: Dredging and Deep Water CAD of Sediment within Round Lake and In-Situ Cover

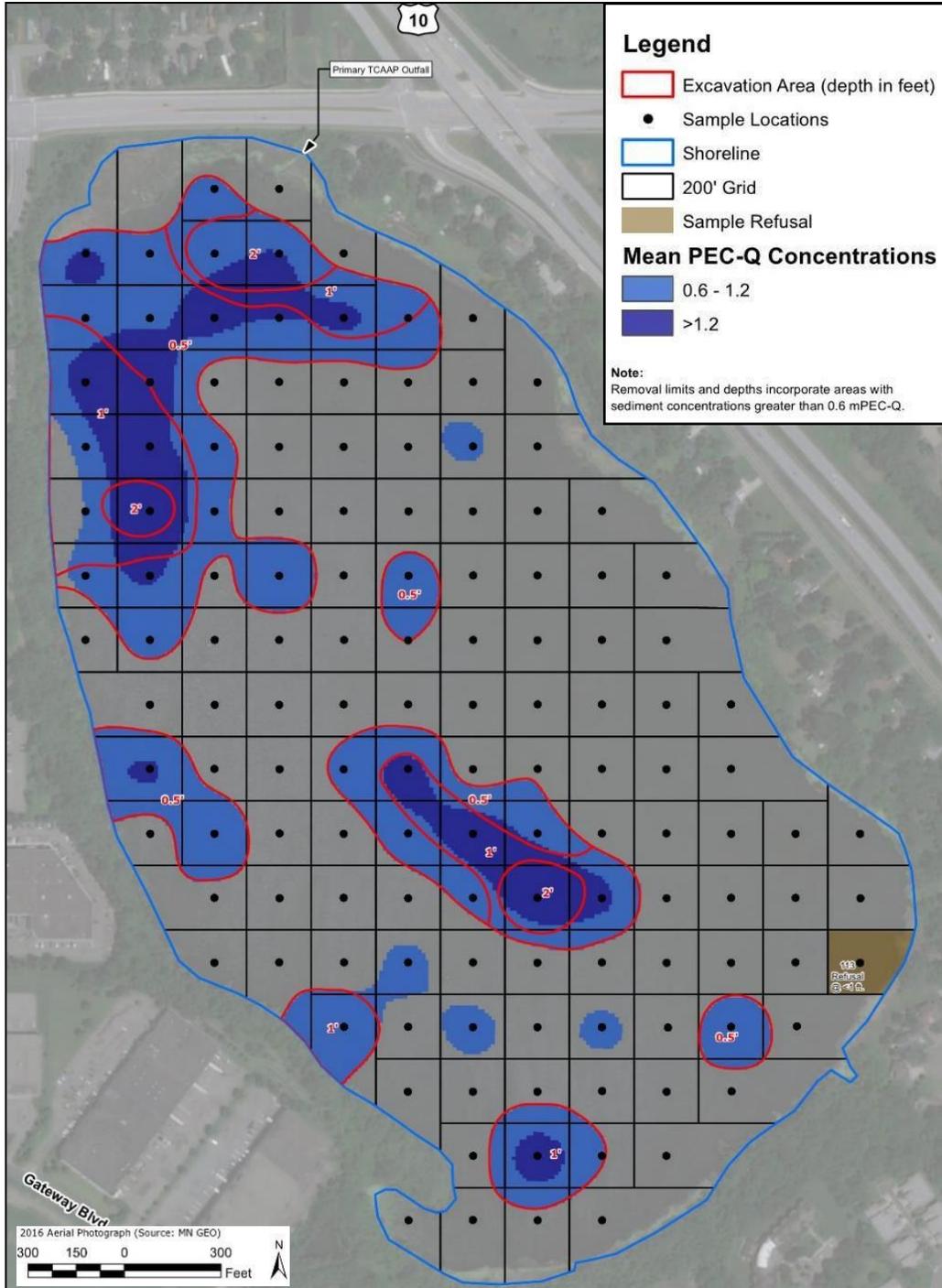
Alternative 1 is the No Action alternative, and no remedial measures would be taken to reduce risks to ecological receptors. A No Action alternative is required by the NCP to provide a comparative baseline against which other alternatives may be evaluated.

Alternative 2 is monitoring recovery that occurs through natural processes. There would be a stated goal for reduction of the ecological risk to a specified level and within a specified amount of time, with monitoring to track and demonstrate the reduction. Alternative 2 would include land use controls (LUCs) to prevent disturbance of the sediment such as prohibiting anchoring and installation of infrastructure (e.g., docks) in/on Round Lake.

Alternative 3 is the placement of a thin-layer of material (sand) over sediment that exceeds a mPEC-Q level of 0.6 to accelerate the natural recovery process. Alternative 3 would include LUCs to prevent disturbance of the sediment such as prohibiting anchoring and installation of infrastructure (e.g., docks).

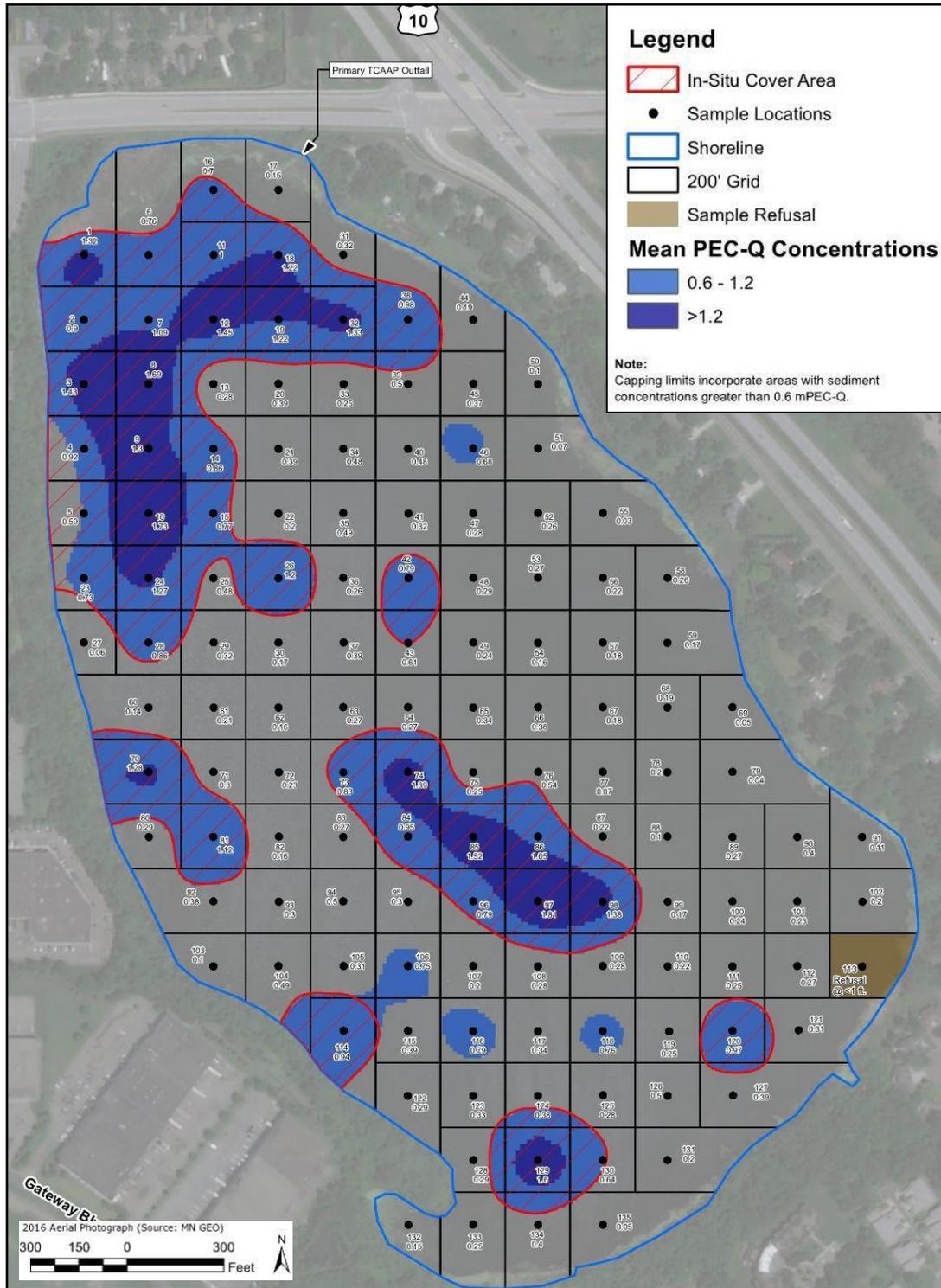
Alternative 4 is dredging of sediment exceeding the mPEC-Q target level of 0.6. Alternative 4 includes two disposal options: Option A (4A) is offsite disposal at an established landfill that is designated and permitted to accept the waste and Option B (4B) is disposal and management at an impoundment developed on the TCAAP property. Dredged sediment would be transported to TCAAP, dewatered, and then the dewatered sediment transported to the disposal site. The water produced from dewatering the sediment would be treated and returned to Round Lake or discharged to a sanitary sewer. Alternative 4A is the preferred alternative (Figure 10).

Figure 10. Conceptual Plan for Alternatives 4A and 4B



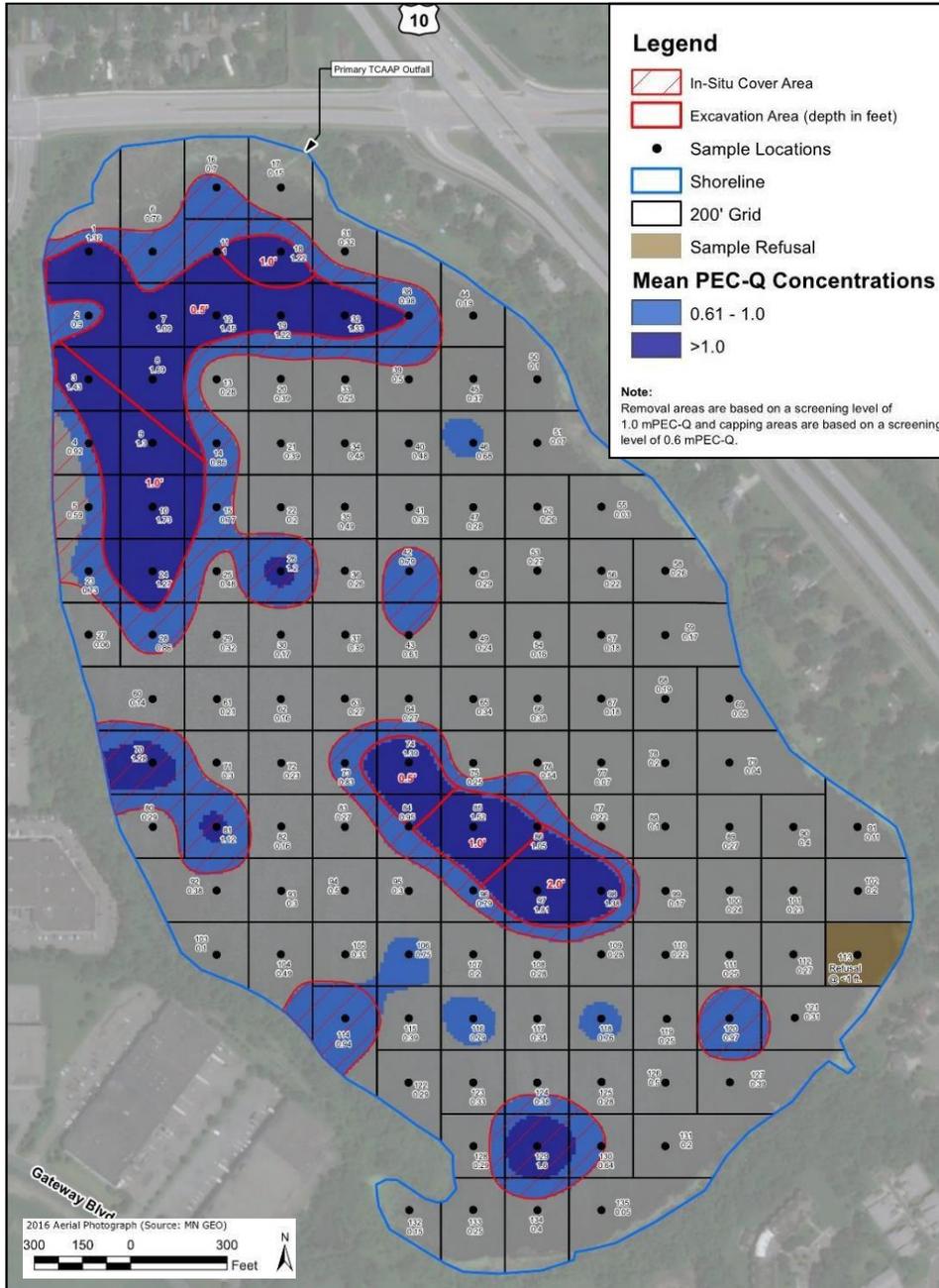
Alternative 5 is placement of an in-situ cover (sand) to serve as a barrier to sediment that exceeds the mPEC-Q level of 0.6 (Figure 11). A cover thickness of 2 feet is used as a basis for comparison. Alternative 5 would include LUCs to prevent disturbance of the sediment such as prohibiting anchoring and installation of infrastructure (e.g., docks).

Figure 11. Conceptual Plan for Alternative 5



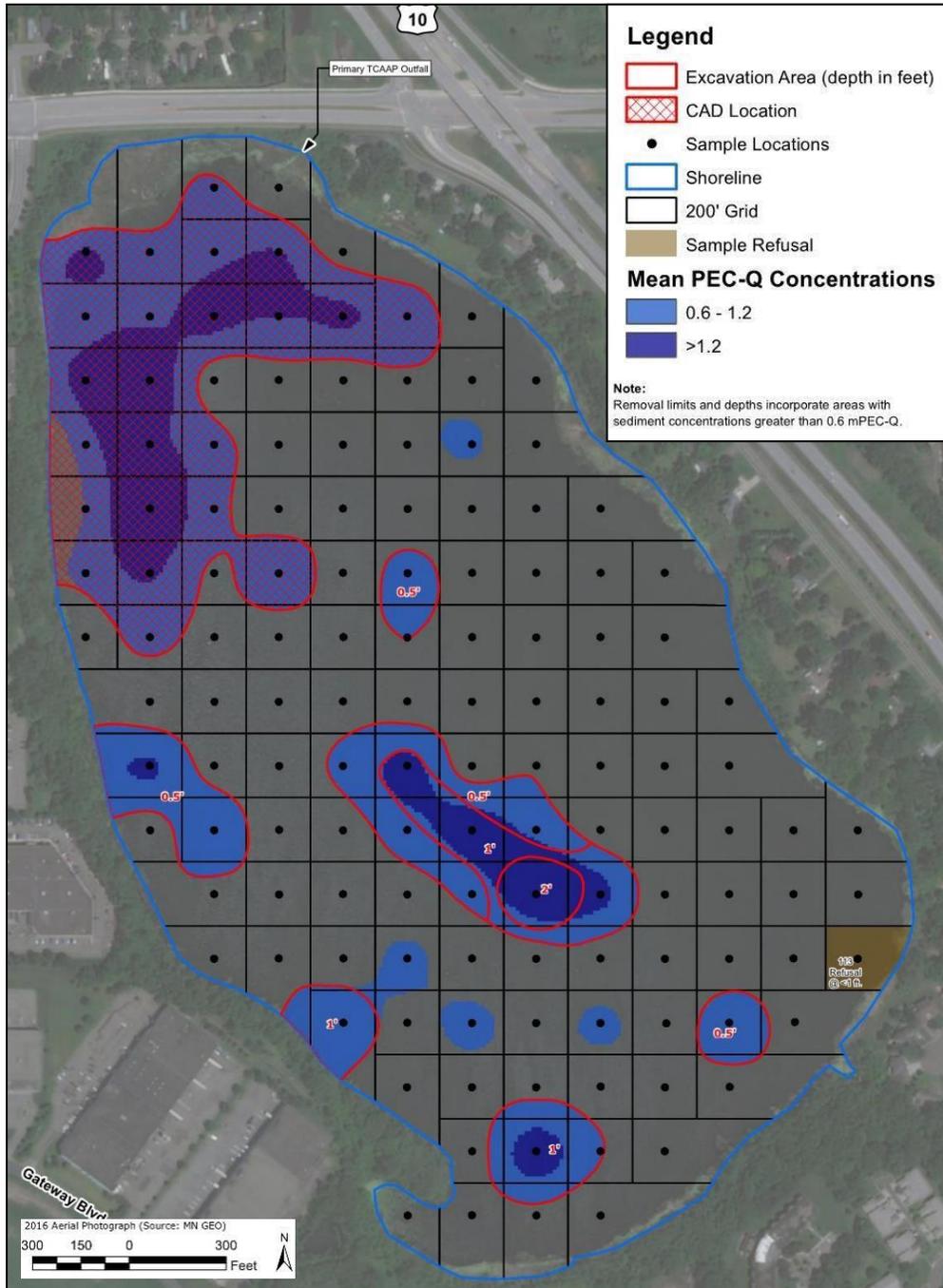
Alternative 6 is a combination of technologies in Alternative 4: Dredging, Dewatering, and Offsite Disposal and Alternative 5: In-Situ Cover (Figure 12). Under this Alternative 6, sediment exceeding the mPEC-Q of 1.0 would be dredged, dewatered, and disposed of as described in Alternative 4. Alternative 6 includes two disposal options for dredged sediment, Alternatives 6A and 6B, and are as described for Alternatives 4A and 4B, respectively. Sediment between the 0.6 and 1.0 mPEC-Q would be covered as described in Alternative 5. As for Alternative 5, a cover thickness of 2 feet is used as a basis for comparison for Alternative 6. Alternative 6 would include LUCs to prevent disturbance of the sediment such as prohibiting anchoring and installation of infrastructure (e.g., docks).

Figure 12. Conceptual Plan for Alternatives 6A and 6B



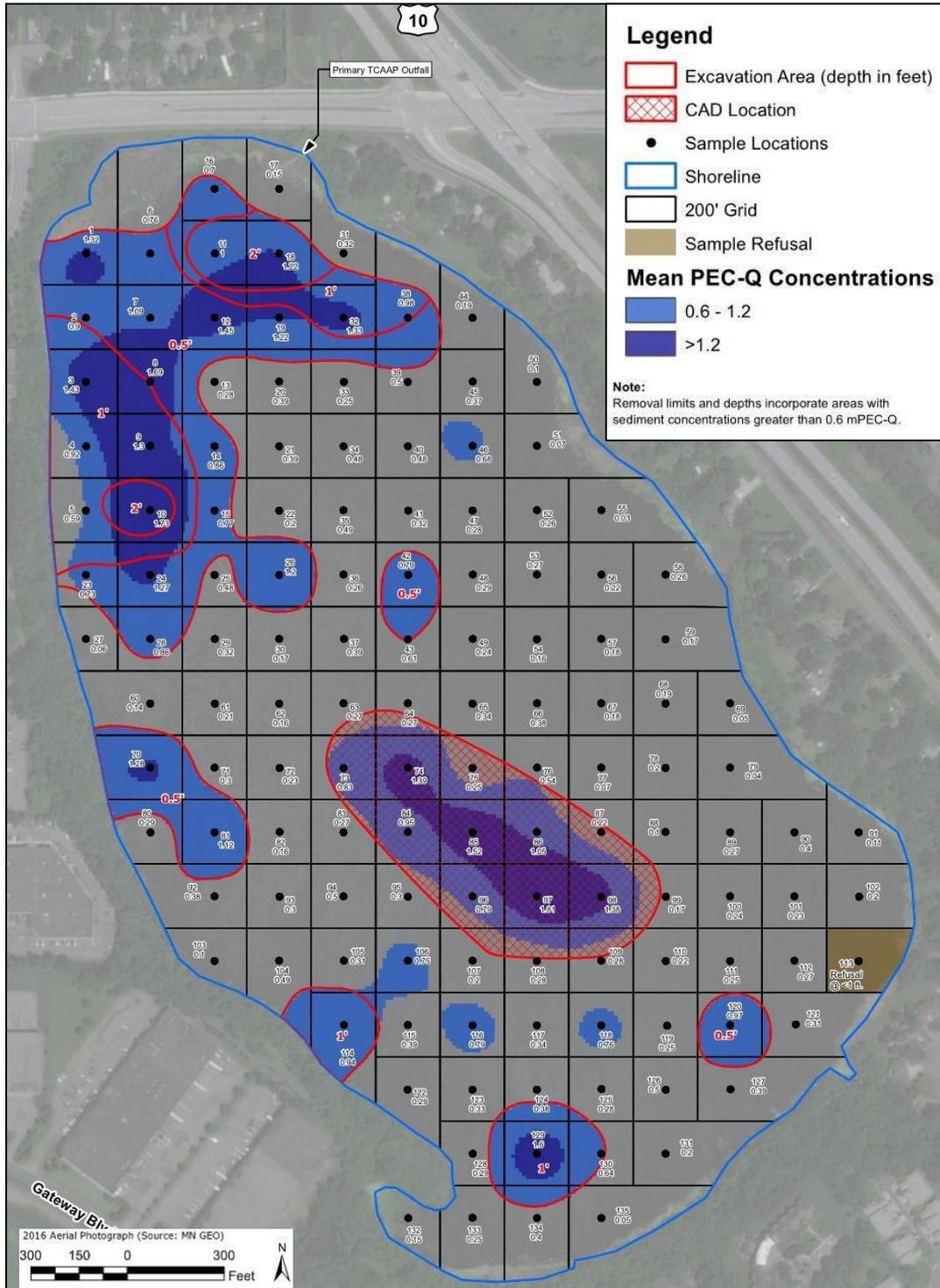
Alternative 7 is dredging of sediment above the 0.6 mPEC-Q target level and placement of the dredged sediment into a near-shore CAD facility located in the northwest part of the lake (Figure 13). A CAD is an underwater containment unit designed to isolate contaminated sediment from the environment and resist erosive forces that could lead to the release of the confined sediment. The sediment would be covered with material obtained from a portion of the lake with sediment concentrations less than the mPEC-Q of 0.35. Alternative 7 would include LUCs to prevent disturbance of the sediment such as prohibiting anchoring and installation of infrastructure (e.g., docks).

Figure 13. Conceptual Plan for Alternative 7



Alternative 8 is dredging of sediment above the 0.6 mPEC-Q target level, and placement of the dredged sediment into a CAD located in the deepest portion of the lake (Figure 14). The sediment would be covered with material obtained from a portion of the lake with sediment concentrations less than the mPEC-Q of 0.35. Alternative 8 would include LUCs to prevent disturbance of the sediment such as prohibiting anchoring and installation of infrastructure (e.g., docks).

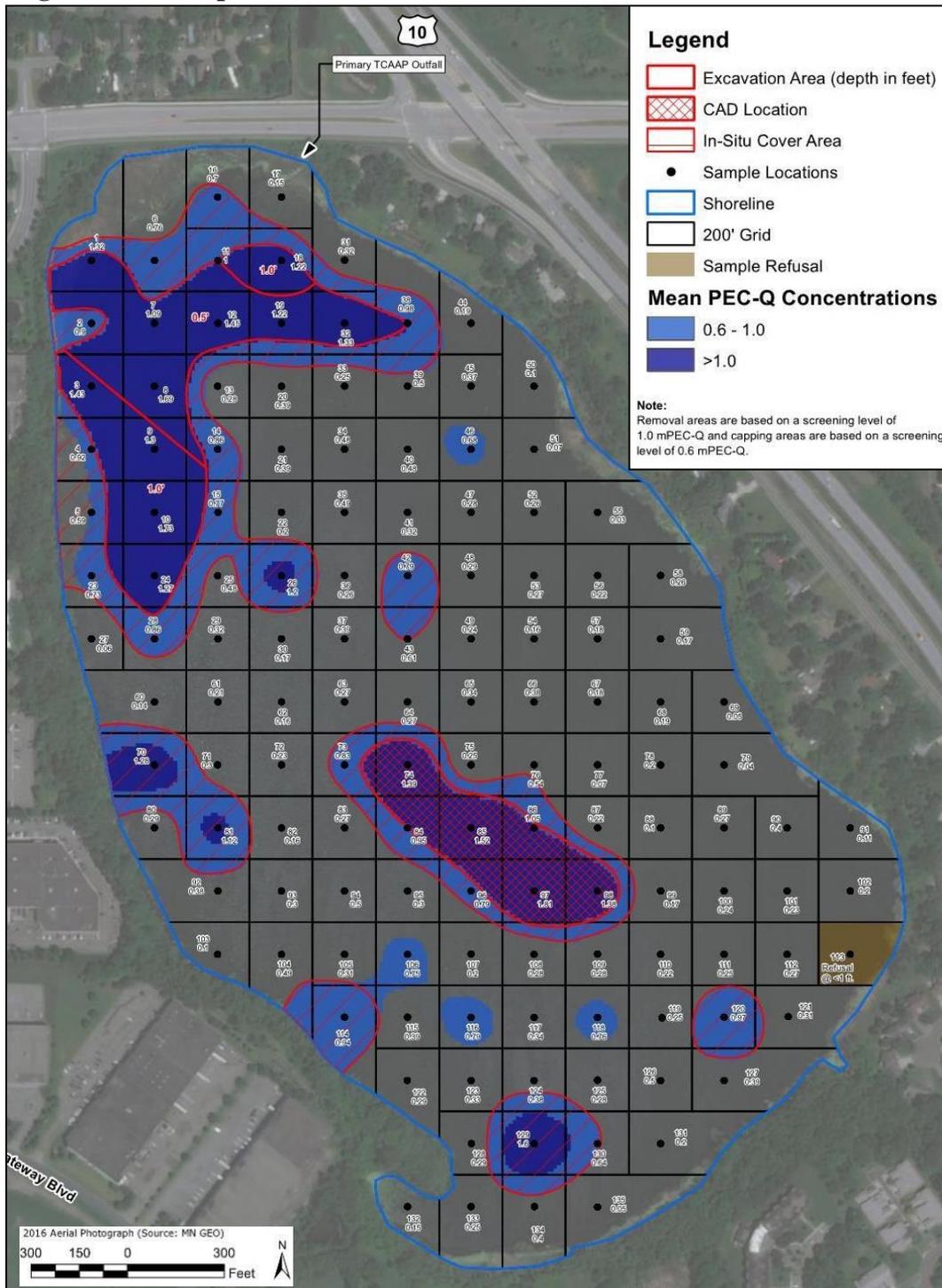
Figure 14. Conceptual Plan for Alternative 8



Alternative 9 is a combination of dredging and in-situ cover (Figure 15). Under this alternative, sediment that exceeds the mPEC-Q level of 1.0 would be removed by dredging and placed into a CAD located in the deepest portion of the lake. Sediment that exceeds the mPEC-Q of 0.6 and is below the mPEC-Q of 1.0 would be covered as described in Alternative 5.

The costs for the alternatives are presented in Table 1 on page 22 of this Proposed Plan.

Figure 15. Conceptual Plan for Alternative 9



EVALUATION OF ALTERNATIVES

The NCP at 300.430(e)(9)(iii) articulates nine evaluation criteria for assessing remedial alternatives for sites that require remediation or mitigation. A detailed comparison of the alternatives is included in the SRI/FS.

The alternatives were compared to the nine criteria in the NCP. The nine criteria are divided into three categories by USEPA: threshold factors, balancing factors, and modifying criteria. Overall protection of human health and the environment and compliance with *Applicable or Relevant and Appropriate Requirements* (ARARs) (unless a specific ARAR is waived) are threshold factors and must be met by each alternative in order to be eligible for selection. Effectiveness (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness), implementability, and cost are balancing criteria. The balancing criteria are used to evaluate alternatives in detail and to balance the relative advantages and disadvantages of each alternative. State acceptance and community acceptance are modifying criteria and are fully considered after public comments on this Proposed Plan are received.

Prior to detailed comparison of the alternatives, Alternatives 2 and 3 were screened out based on uncertainty regarding their effectiveness. Specifically, the USEPA, MPCA, and Army agreed that these alternatives might not be able to achieve the RAO in a reasonable timeframe. Per the NCP at 300.430(e)(6) the no-action alternative shall be developed, but is not eligible for selection here. The following is a summary of the comparison between remaining alternatives (Alternative 1 and Alternatives 4 through 9) for each of the nine criteria specified in the NCP.

EVALUATION CRITERIA FOR CERCLA REMEDIAL ALTERNATIVES

Overall Protection of Human Health and the Environment determines whether a remedial alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Compliance with Applicable or Relevant and Appropriate Requirements evaluates whether the remedial alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is required and justified.

Long-term Effectiveness and Permanence considers the ability of a remedial alternative to maintain protection of human health and the environment over time.

Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates a remedial alternative's use of treatment to reduce the harmful effects of contaminants, their ability to move in the environment, and the amount of contamination present.

Short-Term Effectiveness considers the length of time needed to implement a remedial alternative and the risks the remedial alternative poses to workers, residents, and the environment during implementation.

Implementability considers the technical and administrative feasibility of implementing the remedial alternative, including factors such as the relative availability of goods and services.

Cost includes estimated capital, periodic, and annual operations and maintenance (O&M) costs, as well as present worth cost. Present worth cost is the total cost of a remedial alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

State/Support Agency Acceptance considers whether the State agrees with the Army's analyses and recommendations, as described in the SRI/FS and Proposed Plan.

Community Acceptance considers whether the local community agrees with Army's analyses and preferred remedial alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Overall Protection of Human Health and the Environment. To evaluate remedial alternatives against this criterion, four different factors were considered: short-term protection of the environment, long-term protection of the environment, short-term protection of human health, and long-term protection of human health. The two short-term factors consider affects from the implementation of the alternatives, while the long-term factors consider how the alternatives will achieve goals for protection of human health and the environment in the long-term. All the alternatives (except Alternative 1) create short-term risk to the benthic community through the removal of sediment and/or the placement of cover materials over existing sediment. Removal and covering of sediment disturbs habitat and creates turbidity in the surface water. With the exception of Alternative 1, all of the retained alternatives also create short-term human health risk because of construction activities that may result in worker and/or traffic accidents. The three alternatives that do not require transport of dredge material (Alternatives 7, 8, and 9) are more protective of human health in the short term because there would be no corresponding impacts related to traffic. With respect to long-term protection of the environment, Alternative 1 would provide no improvement over current conditions, would provide no risk reduction, and would not be protective of the environment. Alternatives 4 through 9 reduce long-term risk to ecological receptors by removing and/or isolating sediment above the mPEC-Q of 0.6 and are considered equal for long-term protection of human health because there is no human health risk identified for the sediment.

Compliance with ARARs. All alternatives, other than Alternative 1, the No Action alternative, will meet the threshold criterion of complying with ARARs. Remediation under all other alternatives is expected to be conducted in a manner to attain all ARARs. A full list of ARARs proposed for each alternative can be found in Appendix H of the SRI/FS.

Long-Term Effectiveness and Permanence. Alternatives 4 through 9 are expected to provide long-term effectiveness and permanence in reducing ecological risk. Alternatives 4A, the preferred alternative, and 4B provide the greatest long-term effectiveness and permanence by removing sediment above the mPEC-Q of 0.6. Alternative 8 provides the second highest long-term effectiveness and permanence by consolidating sediment under a cover, which isolates the sediment in a portion of the lake that is protected from potential erosive forces. Alternatives 6A, 6B, 7, and 9 have similar long-term effectiveness and permanence. Alternative 5 has the lowest long-term effectiveness and permanence. For the alternatives that include an in-situ cover component (Alternatives 5, 6, and 7), future erosion of the cover in the shallow water areas may act to reduce the long-term effectiveness. The near-shore CAD location in Alternative 7 may be more susceptible to erosion from stormwater inlets, waves, and ice. The CAD location in Alternatives 8 and 9 is in the deeper water area of Round Lake and has a lower risk of erosion.

Reduction of Toxicity, Mobility, or Volume Through Treatment. The retained alternatives are considered equal because none include treatment of the sediment.¹

Short-Term Effectiveness. Short-term impacts (both to the environment and human health) are those impacts that are associated with the efforts to implement the alternative. Alternatives 4 through 9 involve varying degrees of construction. Although both covering and dredging will have the same impacts on the lake habitat, biota, and wildlife in the areas disturbed, the magnitude increases as the remedial area increases. Considering the area of lakebed disturbed, Alternative 5 would have the

¹ There are no proven cost-effective treatment technologies that address metals and PCBs in sediment. CERCLA has a statutory preference for treatment as a principal element of the preferred remedial alternative or an explanation why the preference for treatment will not be met must be provided.

least impact and Alternative 9 would have the most impact.

Evaluation of short-term risks also considers the risk to human health during remedy implementation, either to site remediation workers or the general public. Because there is no unacceptable human health risk identified for the contaminated sediments, the greatest magnitude of short-term risk would be the risk to the general public from the over-the-road transportation of sediment and cover material, especially at the higher volume levels. Alternatives 7, 8, and 9 would involve zero vehicle miles associated with off-site disposal of dredged sediment or import of backfill/cover materials. Of Alternatives 4 through 6, Alternative 4B would have the fewest vehicle miles while Alternative 4A would involve the most.

The estimated period for completing the remediation for the alternatives are 2 to 4 years for Alternatives 4A and 4B and 3 to 5 years for Alternatives 5, 6A, 6B, 7, 8, and 9.

Combining these considerations results in Alternatives 4A and 6A ranking lowest (most risks) and Alternatives 7, 8, and 9 ranking highest (fewest risks) for short-term effectiveness.

Implementability. Technical implementability components include the ability to construct and monitor the alternative. Using multiple construction techniques (e.g., removal and cover) will increase the complexity of implementation, lengthen the implementation schedule, and introduce more uncertainties. The transload location (where equipment is launched on the lake, sediment is removed from the lake, and cover material is transferred to the lake) is another technical implementability consideration. The location of the laydown area and sediment dewatering area (for alternatives that include sediment removal from the lake) also affect technical implementability. Alternatives 4 through 9 require land for constructing an access road/ramp for in-water equipment and for decontamination of personnel and equipment. For Alternatives 4 through 6, land will also be needed for delivery/management of off-site cover materials and/or contaminated sediment dewatering operations. Traffic issues are also an implementation concern, including access to the lake, congestion on local roadways, and load wear on local roadways.

Alternative 5 is the most implementable because sediment would be covered in place and does not require removal, relocation, dewatering (with potential water treatment), or disposal. Alternative 7 (near-shore CAD), Alternative 8 (deep water CAD), and Alternative 9 (deep water CAD/in-situ cover) are the next most implementable alternatives. While they are more complex than Alternative 5, the CAD and cover components do not involve the dewatering of sediment and off-site disposal. Alternatives 4 and 6, which involve dredging, dewatering, and disposal of sediment would be more difficult to implement than the other alternatives due to construction effort and the added complexities related to sediment dewatering.

Alternative 4A does not require monitoring or five-year reviews. Alternative 4B would likely require monitoring and five-year reviews for the disposal location on the TCAAP property. The area planned for disposed sediment management at TCAAP is no longer available for use, therefore Alternative 4B is not implementable and cannot be the selected remedy. Although Alternative 6A and 6B include five-year reviews, these alternatives result in a small area that would require monitoring. Alternatives 5, 7, 8, and 9 have equivalent long-term monitoring and five-year review requirements. Monitoring will be required to verify cover integrity in areas where sediment is above the mPEC-Q of 1.0. Alternative 8 would likely require less maintenance compared to Alternatives 7 and 9 because the CAD would be located in the deeper portion of the lake where erosion is less likely.

Substantive permit requirements would be met through coordination with the appropriate regulating authorities.

Cost. Cost estimates were prepared for each alternative with an accuracy of about +50% to -30%. Present worth costs for the alternatives are as follows:

- Alternative 1: \$0
- Alternative 4A: \$23.6M
- Alternative 4B: \$19.4M
- Alternative 5: \$13.8M
- Alternative 6A: \$20.5M
- Alternative 6B: \$19.2M
- Alternative 7: \$13.3M
- Alternative 8: \$12.0M
- Alternative 9: \$11.4M

Additional details are provided in Table 1.

State Acceptance. Alternatives 5, 6, 7, and 9 with shallow covers are not acceptable due to anticipated maintenance required to maintain long-term effectiveness and lake ecosystems as well as the difficulty in meeting the substantive requirements of MN Rule 6115.0190 and MN Rule 6115.0200. Alternatives 4A and 4B are acceptable based on permanence, long-term protectiveness, and effectiveness. Alternative 8 is partially acceptable, but ultimate state acceptance will be determined during the design phase depending upon the robustness of the cap as well as the preservation of comparable bathymetry within Round Lake.

Community Acceptance. Community acceptance will be determined through the public review and comment period on this Proposed Plan and will be described in the Round Lake ROD.

Table 1. Cost Estimates for Alternatives

	Alternative	Capital Cost	Long-Term Operating Cost (30-year, Net Present Worth)	Contingency	Total Cost
1	No Action	\$0	\$0	\$0	\$0
2	Monitored Natural Recovery (MNR)	\$75,000	\$362,000	\$109,000	\$500,000
3	Enhanced MNR	\$2,035,000	\$362,000	\$599,000	\$3,000,000
4A	Removal/Disposal (Landfill)	\$18,840,000	\$0	\$4,710,000	\$23,600,000
4B	Removal/Disposal (TCAAP)	\$15,034,000	\$500,000	\$3,884,000	\$19,400,000
5	In-Situ Cover	\$10,500,000	\$522,000	\$2,756,000	\$13,800,000
6A	Removal/Disposal (Landfill) and In-Situ Cover	\$15,928,000	\$452,000	\$4,095,000	\$20,500,000
6B	Removal/Disposal (TCAAP) and In-Situ Cover	\$14,275,000	\$1,072,000	\$3,837,000	\$19,200,000
7	Nearshore Confined Aquatic Disposal	\$10,110,000	\$512,000	\$2,656,000	\$13,300,000
8	Deep Water Confined Aquatic Disposal	\$9,120,000	\$512,000	\$2,408,000	\$12,000,000
9	Confined Aquatic Disposal and In-Situ Cover	\$8,620,000	\$512,000	\$2,283,000	\$11,400,000

SUMMARY OF THE PREFERRED ALTERNATIVE

Alternative 4A is the preferred alternative because it will achieve substantial risk reduction to the benthic community using a proven sediment remediation technology (Figure 10). Based on the nine criteria evaluated as part of the CERCLA process, Alternative 4A ranks among the highest alternatives with significant advantages of long-term effectiveness and protectiveness, and acceptability by the state and landowner. In the SRI-FS, Alternatives 4B and 8 ranked higher than Alternative 4A. The area planned for disposed sediment management at TCAAP is no longer available for use, therefore Alternative 4B is not implementable. Alternative 4A is preferred because it does not require long term operation, maintenance, and monitoring of a sediment containment facility by the Army, which is required for Alternative 8. USEPA and MPCA concur with the selection of the preferred alternative.

Based on the information currently available, the Army believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Army expects the preferred alternative to satisfy the following statutory requirements of CERCLA 121(b):

- Be protective of human health and the environment.
- Comply with ARARs.
- Be cost-effective.
- Utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.
- The preference for treatment as a principal element is not met because there are no cost-effective feasible treatment technologies that address metals and PCBs in sediment.²

COMMUNITY PARTICIPATION

The Army will provide information about TCAAP Round Lake remediation through public meetings, the Administrative Record File, fact sheets, and announcements in the local newspapers – The Star Tribune, Shoreview Press, Press Publications, Anoka County Herald, The Life, and Pioneer Press. Site documents are available for public review in the Administrative Record File and Information Repository at the Minnesota Army National Guard, Arden Hills Army Training Center, 4761 Hamline Ave N, Arden Hills, Minnesota. Please call (651) 282- 4420 for an appointment and directions. The Administrative Record File includes the various documents containing findings and recommendations pertaining to the remedy, in addition to what is identified in this Proposed Plan.

The Army began meeting with a reinvigorated RAB in January 2021 after soliciting interest repeatedly from 2018-2020. The Army presented information on the SRI/FS at the April 20, 2021 meeting. The public meeting about the Proposed Plan will be held in conjunction with a RAB meeting.

A final decision on the remedial alternative will not be made until a review of the comments received during the comment period has been completed. The public comment period begins on July 9, 2021 and ends on August 13, 2021. Comments must be postmarked or emailed no later than August 13, 2021, to be considered.

² CERCLA has a statutory preference for treatment as a principal element of the preferred remedial alternative or an explanation why the preference for treatment will not be met must be provided.

The Army and USEPA, in consultation with the MPCA, will make a final decision on the remedy for Round Lake after the public has had an opportunity to comment. Public comment may lead the Army and USEPA to modify the proposed remedy. Therefore, the public is encouraged to gain a more comprehensive understanding of the site and comment on this Proposed Plan, the rationale for the preference for the preferred remedial alternative, and all other remedial alternatives presented during the public comment period. All written comments received during the public comment period will be considered in making a final decision.

The Army will respond to comments received during the public comment period. These responses will be documented in the Responsiveness Summary in the Record of Decision and will become part of the site's Administrative Record, in accordance with Section 300.825(a)(2) of the NCP, after the ROD is signed.

ADMINISTRATIVE RECORD AND INFORMATION REPOSITORY

Site documents are available for public review in the Administrative Record File and Information Repository at the Minnesota Army National Guard, Arden Hills Army Training Center, 4761 Hamline Ave N, Arden Hills, Minnesota. Please call (651) 282-4420 for an appointment and directions.

Some of the documents from the Administrative Record are available online at: <https://tcaaprab.org/resources/>

HOW TO SUBMIT COMMENTS

There are several ways to comment during the public comment period that runs from July 9 to August 13, 2021:

Mail comment to:

Linda Albrecht

US. Army Environmental Command 2455 Reynolds Rd, Mailstop 112
JBSA Fort Sam Houston, TX 78234-7664

Email comment to: linda.b.albrecht.civ@mail.mil

Please add "Round Lake Proposed Plan" to the subject line of emails.

The public meeting will be held virtually on Tuesday, July 20, 2021 at 7:00 PM Central Standard Time via video conference using Microsoft Teams. Virtual public meeting information will be provided to all RAB members and all community members on the mailing list, as well as any who call or email and request the information. Please call Kay Toye at (520) 903-4363 or email at kay.toye@envrg.com to request access to the public meeting. You will not need to download any software to attend the public meeting; you can use your computer browser or a call-in number will be provided for those without internet access.

For questions call Linda Albrecht at (210) 861-4050 between 7:30 a.m. and 4:00 p.m. Central Standard Time.

GLOSSARY

Administrative Record – A body of documents USEPA uses to form the basis for selection of a response.

Alternative – An option for reducing site risk by cleaning up or otherwise limiting exposure to contamination.

Applicable or Relevant and Appropriate Requirements (ARARs) – Federal, state, and local environmental and public health laws with which remedial action alternatives must comply.

Benthic Invertebrates - organisms that live in or on the bottom sediments of rivers, streams, and lakes.

Chemicals of Concern (COC) – Any regulated substance detected at the contaminated site that is evaluated for potential impacts to public health and the environment. These may also be referred to as contaminants of concern.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – A federal law passed in 1980 and revised in 1986 by the Superfund Amendments and Reauthorization Act to investigate and clean up abandoned or uncontrolled hazardous waste sites.

<https://www.epa.gov/superfund/superfund-cercla-overview>

Confined Aquatic Disposal (CAD) - Under water containment units designed to isolate contaminated sediment from the environment and resist forces that could lead to the release of the confined sediment. CAD facilities are constructed in the waterbody with the completed surface of the cap of the facility below the water level.

Ecological Risk Assessment – The process of evaluating the nature and probability of adverse effects to ecological receptors as a result of exposure to contaminants.

Federal Facility Agreement – An agreement between a department of the federal government, USEPA, and state that facilitates the cleanup of a federally-owned facility.

Human Health Risk Assessment – The process of evaluating the nature and probability of adverse health effects to humans as a result of exposure to contaminants.

Land Use Control (LUC) – Legal restriction to control or restrict present and future use.

Mean probable effect concentration quotient (mPEC-Q) – A unitless index value used to assess sediment data with multiple contaminants. Values were calculated using sediment analytical data and the procedures established by MPCA Guidance for the Use and Application of Sediment Quality Targets for the Protection of Sediment-Dwelling Organisms in Minnesota.

<https://www.pca.state.mn.us/sites/default/files/tdr-gl-04.pdf>

National Oil and Hazardous Substances Contingency Plan (NCP) – The NCP provides the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants (40 Code of Federal Regulations Part 300).

National Priorities List (NPL) – The NPL is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories.

Preferred Alternative – Out of all the alternatives considered, the preferred alternative is the alternative that is proposed to remediate the site.

Proposed Plan (PP) – The PP summarizes the SRI/FS and describes the remedial alternatives, how they were evaluated, and how they compared to one another in each of the nine criteria; identifies the Army’s preferred remedy for public and regulatory review and comment during a formal remedy selection process.

Record of Decision (ROD) – After consideration of comments received during the public comment period, the Army and EPA in consultation with MPCA select a remedial action alternative and announces that in a document (decision document) specifying the selected remedy, its objectives, and its endpoint. The remedial action selected may or may not be the preferred alternative as described in the proposed plan.

Remedial Action Objectives (RAOs) – RAOs specify contaminants and media of concern, potential pathways, and remediation goals. Remediation goals establish acceptable exposure levels that are protective of human health and the environment.

Sediment quality target (SQT) – Numerical standards established and adopted by MPCA based on protection of benthic invertebrates for comparison to surficial sediment chemistry measurements.

Twin Cities Army Ammunition Plant (TCAAP) – Facility constructed by the federal government in 1941 to produce small-caliber ammunition for the United States military. The facility is now closed and much of the land has been transferred out of Army control.