Analysis of Brownfields Cleanup Alternatives-Preliminary Evaluation
Attleboro Dye Works
Settling Pond/Lagoon Remediation
36 Maple Avenue
Seekonk, Massachusetts

I. Introduction & Background

Site Location

The 7.8-acre Attleboro Dye Works site ("Site") is located along the Ten Mile River within a residential neighborhood along the northern portion of town.

Forecasted Climate Conditions

According to the Massachusetts Climate Change Adaption Report[1], the impacts of climate change are wide-ranging and growing in severity in Massachusetts, with impacts from sea level rise, storm events, flooding, greenhouse gas emissions and changing weather patterns. As a coastal state, storm surges have broad implications and impacts to infrastructure, natural resources and ecosystems, including drinking water supplies. The financial impacts are expected to be very high.

Previous Site Use(s) and any previous cleanup/contamination

The 7.8-acre ADW Site consists of three parcels identified by the Town as Map 31, Lot 477; Map 32, Lot 6; and Map 32, Lot 9. The Town acquired the property as a tax taking on November 6, 2019.

- The Site is located within an area of mixed commercial and residential use, and is abutted to the north by Ten Mile River ("river"); to the northeast by Ten Mile River Pond ("pond"), which was formed by a dam; to the southeast by an automotive repair facility and residences; to the southeast by a church; to the south by Maple Avenue; to the southwest by residences; and, to the west by undeveloped land. The Pond is intermittently dry, which is attributed to a breach in the dam.

- The Site appears to have been undeveloped until at least the 1930s. In the 1930s and 1940s, a former tennis racket manufacturer ("E. Kent Tennis Rackets" and "Kent, Inc.,") occupied the Site. From 1945 to 1980, Attleboro Dyeing and Finishing Company owned and operated the Site facility. R.O.C. Realty Corporation purchased the property in 1980 and leased the property to various commercial occupants. The Site was reportedly condemned in 2009, due to partial roof collapse of the industrial facility building.

[1] Climate Change Adaptation Report. Executive Office of Energy and Environmental Affairs and the Adaptation Advisory Committee. September 2011

- A fire, attributed to arson, occurred at the Site on May 1, 2012. Massachusetts Department of Environmental Protection (MassDEP) and United States Environmental Protection Agency (EPA) personnel mobilized at the Site during the fire and conducted monitoring of ambient air, firefighting runoff water, and surface water. The former approximate 101,000 square foot (SF) industrial building is located along the northern/northeastern portion of the Site, with over 70% of the footprint damaged by fire. A former office building is located at the southern portion of the Site, along with the remains of a former pump house, located southeast of the former industrial building. Based on the results of a hazardous materials building survey, there is evidence of asbestos-containing materials (ACM), lead-based paint (LBP) and polychlorinated biphenyls (PCBs) associated with the industrial building.

- Historically, water was diverted from the pond and routed via an underground culvert ("raceway") to beneath the industrial building and "out to the northwest of the parking area", where the pipe discharged to a "man-made drainage channel. Three former Settling Ponds/Impoundments ("lagoons") and a suspect former 4th lagoon, are located at the western/northwestern portion of the Site. Two of the lagoons (Settling Ponds #2/#3) are surrounded by a fenced enclosure. During 2017 assessment activities, the lagoons were observed to contain standing water in the spring and were dry in the summer.

- Site access is restricted along portions of the Site, which include a fenced enclosure along the southern portion of the Site, with a locked gate. Additional fencing within the Site restricts access to the western portion of the industrial building and burned building debris field. The Town installed the fencing in 2012, which restricts access to trespassers as a safety measure and also mitigates potential risk of exposure to Site contaminants.

- On August 14, 1980, Attleboro Dye and Finishing submitted a Notification of Hazardous Waste to EPA, identifying the facility as a treatment, storage and disposal facility of Resource Conservation and Recovery Act (RCRA) hazardous waste (Code U220- for toluene). Upon new ownership in 1980, R.O.C. Realty Corporation submitted a revised notification to EPA. On December 10, 1980, EPA listed the Site in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). The Site is not listed on EPA's National Priority List (NPL). The Site was listed by EPA under MAD001196633 (RCRA) and under the state's hazardous waste program as EPICS-27198.

- In 2016, EPA implemented a Removal Program to manage containerized waste and visible/accessible ACM, which were disposed of off-site. Under an EPA Site Specific-Assessment, abatement of asbestos was performed in 2018 along select exterior areas of the collapsed building, to accommodate assessment activities.

- Remedial Activities: In December 1998, one (20,000-gallon) No.6 fuel oil underground storage tank (UST) and one (4,400-gallon) toluene UST were removed from the Site.

- IRA Condition: A release of heavy metals was discovered by R.O.C. Realty Corporation and reported to MassDEP on October 24, 2008. The release was

discovered in sediments within two of the on-site wastewater lagoons, identified as Settling Ponds #2 and #3. MassDEP assigned Release Tracking Number (RTN) 4-21606 to the release. Response actions included installation of a fenced enclosure under an Immediate Response Action (IRA) Plan, as a measure to mitigate a Condition of Imminent Hazard (IH) and potential exposure to contaminated lagoon sediments by trespassers/receptors. Based on the results of sampling conducted to date, lagoon sediments in Settling Pond #1 do not pose a Potential Condition of IH. The Site is classified by MassDEP as "Tier 1D".

Site Assessment Findings

The historic dyeing processes conducted at the Site included the use of dye fixing agents, and waste dye carriers and the mixing, transfer and storage of metals and petroleum hydrocarbon compounds. These activities occurred during the 60+ year operation of the facility. Floor drains on the lower floor, along with process water from the kettles and cleaning water, were discharged via a "sluice" located below the floor. Historically, water was diverted from the pond and routed via an underground culvert ("raceway") to beneath the industrial facility building and "out to the northwest of the parking area", where the pipe discharged to a "man-made drainage channel", which is referred to as "Mill Canal". Prior to the 1960s, the process waste stream was reportedly discharged to the river. In the 1960s, settling ponds/lagoons were constructed to receive the waste through 1980. It appears that waste sludges (lagoon sediment) were allowed to settle in the unlined settling ponds/lagoons and accumulated wastewater was subsequently discharged from the lagoons to the river.

1. Soils: There are metals and polychlorinated biphenyls (PCB) impacts to surficial soils at the northwestern portion of the Site and localized metals impacts at the southeastern portion of the Site. Lead and polycyclic aromatic hydrocarbons (PAHs) impacts in the immediate vicinity of the building are attributable to burned debris from the 2012 fire. There are localized semi-volatile organic compound (SVOC) impacts to surficial soils in the vicinity of Lagoon #1. Toluene and arsenic were detected in soils associated with the former USTs and appear to be localized. Extractable petroleum hydrocarbons (EPH), PAHs and naphthalene-impacted soils are isolated at the western portion of the intact industrial building footprint.
2. Groundwater: Based on the results of sampling conducted to date, there is no evidence of significant contamination to Site groundwater.
3. Lagoon and canal sediments: Petroleum hydrocarbon, metals, and PCB impacts to lagoon and canal sediments appear to be mostly confined to the Lagoons and canals (with the exception of the northwestern portion of the Site). However, lagoon sediments (specifically at Lagoons #2/#3) may pose a threat of a release of river sediments over time associated with erosion and/or flooding. The high concentrations of metals in lagoon/canal sediments have not been detected at similar concentrations in river sediments. Furthermore, to date, there is no evidence of PCB, or chlorinated VOC (CVOCs) impacts to river sediments or surface water.
4. River sediments: Sediment impacts, including metals, pesticides, CVOCs (carbon disulfide) extend from the northwesterly dam (abutting Ten Mile River Pond) and extend to downstream locations beyond the boundary of the ADW Site. It appears that the

presence of these contaminants is attributed to upstream releases; historic ADW facility releases; and potentially releases from the Lagoons. Although Ten Mile River Pond was formerly owned by R.O.C. Realty, based on the formerly facility owner's responses to U.S EPA, the former ADW facility did not discharge process waste into the Pond. Therefore, Pond sediment contaminants are considered a background condition and are likely attributed to historic industrial upstream discharges.

5. River surface water: Surface water impacts are limited to arsenic.

Based on the results of a Method 3 Human Health Risk Characterization, a condition of No Significant Risk (NSR) does not exist at the Site under current and future land use conditions. A Condition of NSR does not exist for construction workers, trespassers, and residents potentially exposed to soil and/or lagoon sediments.

Based on the results of a Stage I Environmental Screening and Stage II Ecological Risk Characterization, there is not condition of NSR to environmental receptors due to potential exposures to contaminated lagoon sediments and/or surface water

Project Goal (Site reuse plan)

The owner has established plans to clean up and redevelop the Site for mixed use, to include affordable housing, light commercial use and recreational use.

Applicable Regulations

Site Cleanup will be conducted pursuant to the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000. Additional applicable local, state and federal regulatory requirements will be adhered to, including the appropriate procurement of contractors.

Applicable Cleanup Standards

The applicable MCP Standards for the Site are Method 1 Soil Cleanup Standards and MCP Method 1 (S-1) Soil and Groundwater (GW-2/GW-3) Standards.

Cleanup Oversight Responsibility

In 1993, Massachusetts created a model program that privatized the cleanup of hazardous waste sites in the Commonwealth. Licensed Site Professionals (LSPs) are authorized by the Commonwealth to work on behalf of property owners, operators, and other responsible parties to oversee the assessment and cleanup of contamination that has been released into the environment. LSPs are scientists, engineers, and public health specialists with significant professional expertise in oil and hazardous material contamination. LSPs are governed by the Massachusetts Board of Registration of Hazardous Waste Site Cleanup Professionals, also known as the LSP Board. Assessment and cleanup activities are conducted pursuant to the Massachusetts Contingency Plan (MCP). The Town of Seekonk will be conducting the site cleanup.

CLEANUP ALTERNATIVES

A. <u>Description of Cleanup Alternatives</u>

To address contamination at the Site, seven remedial action alternatives (RAAs) were developed.

1. RAA-1: No Remedial Action

The "No Remedial Action" alternative assumes that no additional remedial efforts are implemented to address elevated concentrations petroleum hydrocarbons impacts at the Site. The "No Action" alternative can provide a basis for assessing the effects of implementing remedial actions; however, it does not directly reduce the toxicity, mobility or volume of impacted soils or sediment. This response action alternative does not reduce Site risks associated with groundwater that may be impacted in the future and provides no additional protection to human health or public welfare. Additionally, the contaminants of concern are at levels that do not naturally attenuate and therefore "No Remedial Action" does would not reduce potential risk to human health and/or the environment in the long term.

2. RAA-2: Institutional Controls

Institutional controls are mechanisms to limit access to impacted media and include alternatives such as fencing, barriers, and Activity and Use Limitations (AULs) in the form of deed restrictions. While institutional controls do not eliminate contamination, they can provide an effective, low cost means of reducing exposure potential, and thus risk, if properly maintained and enforced. Institutional controls may be effective in mitigating exposure to soils and sediments in locations at which it may be infeasible to reach background conditions. Implementation of an AUL on a Site property to restrict access to impacted groundwater (other than as "exposure pathway elimination measures" or to restrict access to drinking water) is not supported by MassDEP. However, AULs may be implemented to ensure that engineering controls be maintained to mitigate potential risk.

3. RAA-3: Passive Containment

The primary purpose of passive containment technologies is to isolate impacted media, and thus control potential exposure risks. Passive containment involves placement and/or maintenance of existing horizontal physical barriers, such as a cap, sealant or membrane or building slab, or vertical barriers such as a grout curtain, slurry wall, or sheet piling in the areas of contamination.

4. RAA-4: Active Treatment/Removal/Containment:

For soil and sediment excavations conducted within the water table, dewatering allows for additional soil excavation to be conducted "in the dry"; assists in stabilizing the structure of the excavation; and, serves to remediate groundwater through the use of granulated activated carbon units. Dewatered groundwater is temporarily stored on-site using fractionation (frac) tanks and may be discharged to a municipal utility under a permit; to a catch basin/water body under an EPA Remediation General Permit (RGP); or, disposed of to a licensed acceptance facility and managed as remediation waste.

5. RAA-5: Ex-Situ Technologies: Excavation is an effective approach for source removal. The primary purpose of is to remove impacted media, and thus control potential exposure risks. Excavation involves the removal of impacted soil and sediment that presents a potential direct contact risk, along with soil which may serve as a continuing source of impacts to surface water (abutting river) and potential future source to groundwater. The impacted soil/sediment is

removed from its current setting and transported off-Site for contaminant removal, recycling and/or disposal.

Building Abatement and Demolition: Abatement of hazardous building materials (including ACM) may be conducted prior to building demolition. In addition, building materials and debris may be considered as bulk waste, whereby building materials and demolition debris are managed as hazardous waste. Building demolition includes the removal of aboveground and underground building features and includes the removal of abandoned equipment, piping, and disconnection of utilities. Based on the presence on hazardous building materials and debris; along with contaminant potential migration pathways (including the River and Raceway).

6. RAA-6: *In-Situ* Technologies:

In-situ (organic or inorganic/chemical) treatment or augmentation technologies are most dependent upon the ability to deliver the treatment material to the affected subsurface area, and the sustainability or effective life of the material. Petroleum hydrocarbon and VOC constituents in Site groundwater are amenable to aerobic biological technologies and chemical oxidative technologies (ozone, permanganate, persulfate, oxygen releasing compounds (ORC), and hydrogen peroxide). For metals, stabilization or fixation agents may be applied to immobilize and reduce leachability of contaminants from soil to groundwater. EcoSPEARS® has designed and developed a sorbent polymer extraction and remediation system (SPEARS®) to absorb PCBs into a proprietary compound inside each individual spear or spike that is inserted into contaminated media. Additional research is warranted to evaluate the feasibility of this technology for remediation of lagoon/canal sediments with co-mingled contaminants, along with disposal facility acceptance criteria for the spears/spike waste. To effectively assess performance, bench-scale treatability studies and pilot testing are recommended prior to implementation. These treatments may also reduce costs for ex-situ technologies.

7. RAA-7: Monitoring

Groundwater monitoring is conducted as a measure to assess the effectiveness of the cleanup. Groundwater is collected from monitoring wells at an area within and/or hydraulically downgradient of the cleanup area. Monitoring of Active and Passive Containment Systems includes inspections and sampling and analysis to evaluate system effectiveness.

B. Evaluation of Cleanup Up Alternatives

Effectiveness, Including Climate Change Considerations:

1. **Alternative #1:** No Remedial Action
   Alternative #1 is not effective in controlling or preventing the exposure of Site OHM to human or environmental receptors.

2. **Alternative #2**: Institutional Controls

   An AUL is implemented to effectively address engineering controls, if combined with another RAA. Implementation of an AUL is an effective administrative control to mitigate potential contaminant impacts to receptors.

3. **Alternative #3**: Passive Containment
   A clean cap mitigates direct exposure to contaminated soil, it does not remediate the OHM sources and does not prevent migration of OHM in groundwater to human or environmental receptors. Long-term groundwater monitoring is effective at assessing potential impacts to receptors.

4. **Alternative #4**: Active Treatment/Removal/Containment Systems
   Dewatering is an effective approach to lower the water table to accommodate other technologies (i.e., ex-situ remediation).

5. **Alternative #5**: Ex-Situ Treatment
   Soil and lagoon sediment is excavated and disposed off-site as an effective measure to remediate contaminant sources.

6. **Alternative #6**: In-Situ Treatment
   In-situ treatment may be effective at reducing contaminant impacts to sediments, but bench-scale treatability studies and pilot testing are recommended prior to implementation.

7. **Alternative #7**: Monitoring
   This RAA is useful as a tool to assess the effectiveness of additional RAAs, but ineffective at reducing contaminant impacts.

General Climate Consideration Notes:
Stormwater design will be incorporated as part of Site development. In addition, the cleanup design will include the implementation of stormwater controls. Furthermore, since the Site is located within a floodplain, applicable permitting and design measures will be implemented.

Comparative Effectiveness

In accordance with 310 CMR 40.0858, "the effectiveness of each RAA was evaluated in terms of a) achieving a Permanent or Temporary Solution under 310 CMR 40.1000; (b) reusing, recycling, destroying, detoxifying, or treating oil and hazardous material at the disposal site; and (c) reducing levels of untreated OHM at the site to concentrations that achieve or approach background." The relative effectiveness of a Permanent Solution is judged based on the RAAs ability to reduce the mobility, toxicity, or volume. Refer to Tables 2A and 2B.

1. RAA-1: No Remedial Action: This RAA is ineffective at reducing Site contaminant concentrations.

2. RAA-2: Institutional Controls: A Notice of AUL is implemented to effectively address engineering controls, if combined with another RAA.

3. RAA-3: Passive Containment: This technology is effective at mitigating potential direct contact exposure to contaminated media (horizontal cap), and effective at mitigating contaminant migration (vertical cap).

4. RAA-4: Active Treatment/Removal/Containment: This technology (dewatering) is effective in combination with another remedial technology (i.e., *ex-situ* remediation; passive containment-vertical cap construction).

5. RAA-5: *Ex-Situ* Technologies: This RAA is effective at remediating Site contaminants.

6. RAA-6: *In-Situ* Technologies: This RAA is effective at remediating some contaminants but requires combination with other RAAs to address all contaminants.

7. RAA-7: Monitoring**:** Monitoring is effective to monitor the effectiveness of other RAAs.

Comparative Reliability

In accordance with 310 CMR 40.0858 (2), the short and long-term reliability for each of the RAAs were evaluated based on "(a) the degree of certainty that the RAA would be successful; and (b) the effectiveness of measures required to manage residues or remaining wastes or control emissions or discharges to the environment." Specific factors considered in judging the short and long-term reliability include: protection of workers and the community during construction, environmental impacts resulting from implementation of the remedial response action, the time required to achieve protection and long-term reliability of management controls providing protection from residual wastes. Refer to Tables 2A and 2B.

1. RAA-1: No Remedial Action: This RAA is unreliable in reducing Site contaminant concentrations.

2. RAA-2: Institutional Controls: A Notice of AUL is a moderately reliable measure to address engineering controls associated with contaminated soils and lagoon/canal sediments.

3. RAA-3: Passive Containment: This alternative has a moderate degree of certainty of success in reliability.

4. RAA-4: Active Treatment/Removal/Containment: This alternative has a moderate to high degree of certainty of success in reliability.

5. RAA-5: *Ex-Situ* Technologies: This technology is a highly reliable technology to remediate contaminant concentrations in soil and lagoon/canal sediments.

6. RAA-6: *In-Situ* Technologies: This technology has a low to moderate degree of certainty of success in reliability to remediate lagoon/sediment contaminants and requires additional evaluation.

7. RAA-7: Monitoring**:** This alternative has a moderate degree of certainty of success in reliability, since it relies on other technologies.

Comparative Difficulty in Implementation

In accordance with 310 CMR 40.0858(3), difficulty in Implementation of each of the alternatives was evaluated based on: "(a) the technical complexity of the alternative; (b) where applicable the integration of the alternative with existing facility operations and other current or potential remedial actions; (c) any necessary monitoring, operations, maintenance or site access requirements or limitations; (d) the availability of necessary services, materials, equipment, or specialists; (e) the availability, capacity and location of necessary off-site treatment, storage and disposal facilities; and (f) whether the alternative meets regulatory requirements for likely approvals, permits or licenses required by MassDEP or other state, federal or local agencies." Refer to Tables 2A and 2B.

1. RAA-1: No Remedial Action: This RAA is readily implementable. However, there are issues and concerns associated with contaminant exposure associated with future development. Ongoing monitoring and inspection of the Site is required, along with access limitations.

2. RAA-2: Institutional Controls: There is low to moderate technical complexity associated with implementation and a Notice of AUL is easily integrated.

3. RAA-3: Passive Containment: There is moderate technical complexity and operation, monitoring & maintenance (OM&M) associated with implementation, including temporary access limitations. There are temporary access limitations and specialized materials, equipment and personnel required for implementation. A low to moderate level of capacity associated with off-site treatment, storage and disposal (TSD) facilities is required.

4. RAA-4: Active Treatment/Removal/Containment: There is low to moderate technical complexity and OM&M associated with implementation, including temporary access limitations. There are temporary access limitations and specialized materials, equipment and personnel required for implementation. A low to moderate to high level of capacity associated with off-site TSD facilities is required.

5. RAA-5*: Ex-Situ* Technologies: There is moderate to high technical complexity and OM&M associated with implementation, including temporary access limitations. There are temporary access limitations and specialized materials, equipment and personnel required for implementation. A moderate level of capacity associated with off-site TSD facilities is required.

6. RAA-6: *In-Situ* Technologies: There is moderate to high technical complexity and OM&M associated with implementation, including temporary access limitations. There are temporary access limitations and specialized materials, equipment and personnel required for implementation. A moderate to high level of capacity associated with off-site TSD facilities is required for SPEARS®.

7. RAA-7: Monitoring: There is low technical complexity and OM&M associated with implementation, including temporary access limitations.

Comparative Costs

In accordance with 310 CMR 40.0858 (4), the cost to implement each alternative was evaluated based on (a) costs of implementing the alternative, including without limitation: design, construction, equipment, site preparation, labor, permits, disposal, operation, maintenance and monitoring costs; (b) costs of environmental restoration, potential damages to natural resources, including consideration of impacts to surface waters, wetlands, wildlife, fish and shellfish habitat; and (c) the relative consumption of energy resources in the operation of the alternatives, and externalities associated with the use of those resources.

1. RAA-1: No Remedial Action: This RAA includes high costs for security, inspections and monitoring and cost of environmental restoration.

2. RAA-2: Institutional Controls: There are low costs to implement this technology.

3. RAA-3: Passive Horizontal Containment: There moderate costs associated with this technology.

4. RAA-4: Active Treatment/Removal/Containment: There is moderate to high technical cost associated with this technology.

5. RAA-5: *Ex-Situ* Technologies: There are high costs associated with this technology.

6. RAA-6: *In-Situ* Technologies: There are moderate to high costs associated with this technology.

7. RAA-7: Monitoring: There are low to moderate costs associated with monitoring and reporting.

Comparative Risks

In accordance with 310 CMR 40.0858(5), the risks associated with each RAA were evaluated based on: (a) the short-term on-site and off-site risks posed during implementation of the RAA associated with any excavation, transport, disposal, containment, construction, operation or maintenance activities, or discharges to the environment from remedial systems; (b) the on-site and off-site risks posed over the period of time required for the RAA to attain

applicable remedial standards, including risks associated with ongoing transport, disposal, containment, operation or maintenance activities, or discharges from remedial systems; and (c) the potential risk of harm to health, safety, public welfare or the environment posed to human or environmental receptors by any oil and/or hazardous material remaining at the disposal site after the completion of the remedial action.

1. RAA-1: No Remedial Action: This RAA has a high risk of harm to human and environmental receptors, since contaminants remain in place.

2. RAA-2: Institutional Controls: There are low to moderate risks associated with this action, assuming OHM is contained/isolated and reduced/mitigated.

3. RAA-3: Passive Containment: There are low to moderate risks associated with this action, assuming OHM is contained/isolated and reduced/mitigated.

4. RAA-4: Active Treatment/Removal/Containment: There is moderate risk, since short-term risk associated with exposure to contaminants is mitigated with health & safety (H&S) measures.

5. RAA-5: *Ex-Situ* Technologies: There is moderate risk, since short-term risk associated with exposure to contaminants is mitigated with H&S measures.

6. RAA-6: *In-Situ* Technologies: There is low to moderate risk, since short-term risk associated with exposure to contaminants is mitigated with H&S measures.

7. RAA-7: Monitoring: There are low to moderate risks associated with implementation of this activity.

Comparative Benefits

In accordance with 310 CMR 40.0858(6), the benefits of each RAA were evaluated based on: "(a) the benefit of restoring natural resources; (b) providing for the productive reuse of the Site; (c) the avoided costs of relocating people, businesses, or providing RAA water supplies; and (d) the avoided lost value of the Site."

1. RAA-1: No Remedial Action: This RAA is not beneficial, since natural resources are not restored, and productive use of the Site is limited for the long term.

2. RAA-2: Institutional Controls are somewhat beneficial, since natural resources are not restored; however productive use of the Site is provided.

3. RAA-3: Passive Containment: This technology reduces some potentially negative impacts of OHM to natural resources and limits some productive use of portions of the Site for the long term.

4. RAA-4: Active Treatment/Removal/Containment: This technology reduces some potentially negative impacts of OHM to natural resources and limits some productive use of portions of the Site for the long term.

5. RAA-5: *Ex-Situ* Technologies: This technology reduces some potentially negative impacts of OHM to natural resources and limits some productive use of portions of the Site for the short term.

6. RAA-6: *In-Situ* Technologies: This technology reduces some potentially negative impacts of OHM to natural resources and limits some productive use of portions of the Site for the short term.

7. RAA-7: Monitoring**:** This technology identifies opportunities to restore natural resources and limits some productive use of portions of the Site for the long term.

Comparative Timeliness

In accordance with 310 CMR 40.0858(7), a review is required of "the comparative timeliness of the RAAs in terms of eliminating any uncontrolled sources of oil and/or hazardous material and achieving a level of No Significant Risk as described in 310 CMR 40.0900."

1. RAA-1: No Remedial Action: This RAA results has no positive impact in the time needed to achieve a condition of NSR, since no action is taken.

2. RAA-2: Institutional Controls: The duration to achieve a level of NSR is moderate to high, due to the implementation of other technologies.

3. RAA-3: Passive Containment: The duration to achieve a level of NSR is moderate.

4. RAA-4: Active Treatment/Removal/Containment: The duration to achieve a level of NSR is moderate.

5. RAA-5: *Ex-Situ* Technologies: The duration to achieve a level of NSR is low to moderate.

6. RAA-6: *In-Situ* Technologies: The duration to achieve a level of NSR is moderate.

7. RAA-7: Monitoring: The duration to achieve a level of NSR is moderate to high, due to the implementation of other technologies.

Comparative Effect Upon Non-Pecuniary Interests

The non-pecuniary interests of each RAA were evaluated based on aesthetics and interests of the local community in accordance with 310 CMR 40.0858(8), "the relative effect of the RAAs upon non-pecuniary interests, such as aesthetic values" was evaluated.

1. RAA-1: No Remedial Action: This RAA will have high detrimental impacts on the interests of the local community, due to concerns regarding contamination and a high impact on site aesthetics, due to site conditions.

2. RAA-2: Institutional Controls: This RAA has a moderate to high positive impact on the interests of the local community and aesthetics, since this technology accommodates redevelopment.

3. RAA-3: Passive Containment: This technology has a low to moderate impact on the interests of the local community and aesthetics, since technology has few visible features that impact aesthetics and supports redevelopment.

4. RAA-4: Active Treatment/Removal/Containment: This technology has a moderate impact on the interests of the local community and aesthetics, since technology has short-term impacts on aesthetics and supports redevelopment.

5. RAA-5: *Ex-Situ* Technologies: This technology has a moderate impact on the interests of the local community and aesthetics, since technology has short-term impacts on aesthetics and supports redevelopment.

6. RAA-6: *In-Situ* Technologies: Low to moderate effect, since technology has few visible features that impact aesthetics; has short-term impacts and supports redevelopment.

7. RAA-7: Monitoring: Groundwater monitoring is anticipated to have a moderate effect on aesthetics and disturbance to the community (i.e., visible presence of wells).

Cost Comparisons

C. Recommended Cleanup Option

Ex-Situ Technologies: Excavation and off-site disposal of lagoon and sediments. Based on our understanding of the potential sources of the PCBs in these sediments, these materials are not considered a PCB Remediation Waste and can be managed as a non-Toxic Substances Control Act (TSCA) waste.