

Generic Template for Final Remedial Action Work Plan DER Managed Projects

Instructions

This document is a generic template for development of a Remedial Action Work Plan (RAWP) for Brownfield Cleanup Projects performed under the management of NYSDEC, Division of Environmental Remediation. This document is intended to expedite development of the RAWP. By providing format and general content guidelines, it is intended to increase the predictability of format and content required for agency approval; shorten the document preparation time by Applicants in the program; improve the quality of draft RAWP submittals; shorten the review time by NYSDEC; and streamline and expedite the process for RAWP approval by NYSDEC. This is a generic and non-site-specific guide that does not address all possible NYSDEC or NYSDOH issues. It is not intended to replace DER-10 Technical Guidance for Site Investigation and Remediation, DER-31 Green Remediation, or to act as a substitute for the agency review and comment process.

This document contains blue text, green text and highlighted bracketed items. Blue text indicates text that is generally acceptable to NYSDEC for use in the site-specific SMP. While it must be applied to each site in a manner that is suitable for site-specific conditions, use of this blue text with minimal changes will generally facilitate the timely acceptance of the SMP by NYSDEC. Green text provides guidance on the recommended content in each of the specific sections of the SMP **and should be deleted from this template** prior to submittal. Items highlighted in blue brackets are variable and should be entered in a clear, self-explanatory manner, specific to each case.

It is strongly recommended that the draft SMP submittal to NYSDEC adhere to the following conventions:

- Retain the original blue text color for all blue text that is not changed.
- Use black text for all new text, including any changes to blue text.
- Delete all green text.
- Remove highlights.
- Use track changes redline/strikeout method for all removal and replacement of blue text.
- Submit the redline/strikeout document (with blue text strikeouts in the text and not in the margins) along with a clean copy of the draft SMP to the NYSDEC.

While this approach is not mandatory, it should significantly reduce the review time required by NYSDEC staff and expedite approval of the document.

[SITE NAME]
[COUNTY NAME], COUNTY
[CITY], NEW YORK

Remedial Action Work Plan

NYSDEC BCP Number: Cxxxxxx

Prepared for:

[Name]

[Address]

Prepared by:

[Name]

[Address]

[Phone]

[MONTH YEAR]

CERTIFICATION STATEMENT

I, _____, certify that I am currently a NYS registered professional engineer and that this Remedial Action Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31).

NYS Professional Engineer #

Date

Signature

Note: include PE stamp

Remedial Action Work Plan

This Table of Contents should be revised as appropriate for the site-specific Site Management Plan.

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Executive Summary

This Section must include two components, (1) a summary of the Remedial Investigation results, and (2) a brief and numbered summary of all elements of the proposed Remedial Action, including a description of each Engineering and Institutional Control. Each of these components should be comprehensive and concise. The following guidance is provided for this section:

SITE DESCRIPTION/PHYSICAL SETTING/SITE HISTORY

Briefly describe the name and BCP ID number, Site location and setting, surrounding property uses and Site history. The Site history should include an evaluation of past Site uses and how those uses may have caused environmental impacts at the Site. Note whether the Applicant is a Participant or Volunteer.

SUMMARY OF THE REMEDIAL INVESTIGATION

Briefly discuss the findings of the Remedial Investigation (RI), and their significance for each of the media (soil, groundwater, soil vapor, surface water, etc.) that were sampled/analyzed for the project. Include a bulleted summary of the work performed under the RI. This discussion should lay the foundation for the remediation action objectives identified for the project and indicate whether that particular media requires remediation. Coordination with concise Executive Summary figures that show the aerial extent of contamination in soil, groundwater, or sediments is very useful.

As necessary, briefly summarize the Site geology and hydrogeology as they relate to the nature and extent of contamination (e.g., soil types, water bearing units, depth to groundwater, depth to bedrock, groundwater flow direction) and other unique features that may impact the migration/distribution of contaminants.

Include a list of potential green/sustainable elements identified to be considered during design and implementation of the remedy. This list should consider the recommended remedial alternative and green measures listed in ASTM E2893 - Industry Standard for Greener Cleanups Table 3.1. Best Management Practice analysis and a footprint analysis, and related information, may help inform the green and sustainable remediation evaluation during the RI.

Consider EPA's BMPs related to green remediation (<https://clu-in.org/greenremediation/bmps>) for the applicable program elements: Site investigation; Excavation and surface restoration; Soil vapor extraction and air sparging technologies; Pump and treat technologies; Bioremediation; In situ thermal technologies; Landfill cover systems and associated energy production; Materials and waste management. EPA also has climate resiliency fact sheets (<https://www.epa.gov/superfund/superfund-climate-resilience>) related to: Sediment

cleanups; Containment remedies Groundwater treatment remedies. Other guidance may be developed and released over time.

QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

Briefly summarize the human health exposure assessment's conclusions. Address both on-Site and off-Site exposures. Summarize both potential and completed exposure pathways and how they will be addressed by the RAWP.

FISH AND WILDLIFE ASSESSMENT (FWIA)

Briefly summary the FWIA's conclusions. Address both on-Site and off-Site exposures. Summarize both potential and completed exposure pathways and how they will be addressed by the RAWP.

SUMMARY OF THE REMEDY

Include a concise but complete description, by numbered paragraphs, of the selected remedy including all Engineering/Institutional Controls and the goals of each element of the Remedial Action. To the extent possible, list items in the order they will be implemented. Examples are listed below and may be used, if appropriate.

1. A remedial program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:
 - Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
 - Reducing direct and indirect greenhouse gases and other emissions;
 - Increasing energy efficiency and minimizing use of non-renewable energy;
 - Conserving and efficiently managing resources and materials;
 - Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
 - Maximizing habitat value and creating habitat when possible;

- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise™ (available in the Sustainable Remediation Forum [SURF] library) or similar Department accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial program, as appropriate. The project will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial program.

Additionally, the remedial program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation of soil/fill exceeding Track [4] SCOs listed in Table [x];

3. Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site work;
4. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track [4] SCOs;
5. Appropriate off-Site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;
6. Import of materials to be used for backfill and cover in compliance with: (1) chemical limits and other specifications included in Table [x], (2) all Federal, State and local rules and regulations for handling and transport of material;
7. Construction and maintenance of a site cover consisting of [summary of cover types] to prevent human exposure to residual contaminated soil/fill remaining under the Site;
8. Recording of an Environmental Easement, including Institutional Controls, to prevent future exposure to any residual contamination remaining at the Site (a copy of the Environmental Easement is provided in Appendix [x]);
9. Publication of a Site Management Plan for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;
10. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

Remedial Action Work Plan

1.0 INTRODUCTION

[[Applicant / Volunteer / Participant] name(s)] entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in [month, year], to investigate and remediate a [size]-acre property located at [address and location] in [village, county] New York. [BCA Applicant] is a [Participant or Volunteer] in the Brownfield Cleanup Program. [Site usage type, i.e., Restricted Residential use, Commercial use, etc.] is proposed for the property. When completed, the Site will contain [general description of Site usage]. Refer to the Brownfield Cleanup Program (BCP) application for additional details.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), performed between [date] and [date]. It provides an evaluation of a Track 1 cleanup and other applicable Remedial Action alternatives, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in DER-10, DER-31, and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State and local laws, regulations and requirements. The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site [does/does not] pose a significant threat to human health and the environment. The RI for this Site [did/did not] identify fish and wildlife resources.

If Fish & Wildlife resources are identified, add the following paragraph:

Per DER-10 Section 3.10, a Fish and Wildlife Resources Impact Analysis (FWRIA) has been performed and can be found in Section [x]. This RAWP includes appropriate measures for delineating and protecting the identified resource and for monitoring construction related impacts consistent with DER-10 FWRIA Part 3. These resources are identified on remedial drawings. The NYSDEC Division of Fish and Wildlife and/or Division of Marine Resources and the NYS Natural Heritage Program will be contacted, as defined in DER-10, and, at a minimum, all

substantive technical requirements for applicable resource related permits (e.g., 6 NYCRR Parts 608, 661, 663) will be met.

The following text should be included somewhere in this section:

A formal Remedial Design document [will/will not] be prepared.

If a formal Remedial Design is to be performed, add:

The [Remedial Design Work Plan or draft Remedial Design Report] will be submitted by [scheduled date].

Note: as part of the final submission, the RAWP must be submitted in its **entirety** in electronic format on a disk or other electronic media as an attachment to the document. All electronic file names must adhere to the pre-established NYSDEC naming conventions.

1.1 Site Location and Description

The Site is located in the County of [county name], [City], New York and is identified as Block xxx, Lot xxx on the [City] Tax Map. A [United States Geological Survey (USGS) topographical quadrangle or other suitable type] map (Figure [x]) shows the Site location. The Site is situated on an approximately [x]-acre area bounded by [road, feature] to the north, [road, feature] to the south, [road, feature] to the east, and [road, feature] to the west (see Figure [x]). A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The [size]-acre property is fully described in Appendix [x] – Metes and Bounds. A global positioning system coordinate for the starting point is included.

1.2 Contemplated Redevelopment Plan

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. The proposed redevelopment plan and end use is described here to provide the basis for this assessment. However, the Remedial Action contemplated under this RAWP may be implemented independent of the proposed redevelopment plan.

This section should provide a description of the proposed redevelopment. Attention should be paid to future land uses at and below grade. The section should include a figure that shows the development plan.

1.3 Description of Surrounding Property

This section should provide a description of the adjoining property and usage, zoning, character of the neighborhood and should identify sensitive receptors, including but not limited to:

- Schools
- Day care facilities
- Hospitals
- Residential areas
- Rivers, streams
- Wetlands
- Sensitive Receptors

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved Remedial Investigation (RI) Work Plan dated [month, year] and [add any supplemental RI Work Plans here]. The investigation was conducted between [date] and [date]. The RI was submitted to NYSDEC on [insert date] and approved by NYSDEC on [insert date].

2.1 Summary Remedial Investigations Performed

This section should include a summary of all Remedial Investigation elements. It should be concise but complete and include quantities of each element. Tabular presentations are preferred.

2.1.1 BORINGS AND WELLS

2.1.2 SAMPLES COLLECTED

Describe samples collected for all matrices (soil, groundwater, soil vapor, etc.).

2.1.3 CHEMICAL ANALYTICAL WORK PERFORMED

Include a Table summarizing all samples performed (matrices, analytes, samples numbers, etc.)

2.1.X [GEOPHYSICAL WORK, TEST PITS, OTHER]

Include a separate section for each major area of study.

2.1.4 BEST MANAGEMENT PRACTICES

Describe best management practices (BMPs) implemented at the site to reduce the environmental footprint of the RI.

2.1.X DOCUMENTATION

Include maps of sample locations and summary tables, including a footprint analysis.

Below is a summary of RI findings.

Note: The following sub-sections should provide a summary of the RI findings but not a lengthy recitation of the RI. They should be brief with reference to other documents as necessary.

2.2 Significant Threat

The NYSDEC and NYSDOH have determined that this Site [does/does not] pose a significant threat to human health and the environment. Notice of that determination has been provided for public review. A copy of the notice is included in Appendix [x].

If the significant threat determination has not yet been made, use the following text:

A significant threat determination to human health and the environment has not yet been made. Upon determination, notice will be provided for public review.

2.3 Site History

This section should describe the following topics and others that are necessary or relevant.

2.3.1 PAST USES AND OWNERSHIP

2.3.2 PHASE I AND PHASE II REPORTS

2.3.3 SANBORN MAPS

- All Sanborn maps should be obtained and reviewed. These maps should be presented in an appendix of the report and summarized here.
- Former operations, processes and building structures and their location
- Notable structures (vaults, tanks, etc.)
- The following text should be included somewhere in this section:

All Sanborn Maps available for this Site were reviewed prior to preparation of the RAWP.

2.4 Geologic and Hydrogeologic Conditions

This section should describe:

- Summary of any work performed to delineate or describe geological/hydrological conditions (include number of borings, wells, etc.)
- Lithology (including historical fill) with thicknesses
- Include a geologic section (Figure)
- Hydrogeology
- Depth to groundwater
- Groundwater flow conditions
- Flow directions, local and regional
- Groundwater flow map with data (Figure)
- Table of data
- The following text should be included somewhere in this section:

A geologic section is shown in Figure [x].

A groundwater flow map is shown in Figure [x].

2.5 Contamination Conditions

This section should apply the general concept of Areas of Concern (AOC) based on past land usage and observed distributions of contamination. See DER-10 for more information.

Topics should include:

2.5.1 CONCEPTUAL MODEL OF SITE CONTAMINATION

This section should utilize historic site use, tank and spill locations, geologic and hydrogeologic conditions, and contaminant characteristics to produce a robust conceptual site model. Surrounding property information should also be considered when there is no clear on-site source. The model should encompass, if known, how the contamination found during the remedial investigation migrated to its current location(s) and how it could travel in the future. Actual and potential human and environmental receptors should also be identified. The remedy should take this into account to prevent future exposures and off-site migration of contamination.

- On-Site
- Off-Site

2.5.2 DESCRIPTION OF AREAS OF CONCERN

Identify original locations and all available information on:

- USTs
- Separate phase contaminant enclaves
- Recorded spills
- Historic fill
- Vaults
- Drains
- Pipes, transformers
- Other potential sources of contamination
- Contaminated Media
 - Soil
 - Soil vapor
 - Groundwater

Note: more detail should be provided in breakout sections below

2.5.3 IDENTIFICATION OF STANDARDS, CRITERIA AND GUIDANCE

See Appendix 1 of this document for Applicable SCGs. Applicable SCGs should be listed in this section with additional text as necessary.

2.5.4 SOIL/FILL CONTAMINATION

Provide an introduction for the topics below.

2.5.4.1 SUMMARY OF SOIL/FILL DATA

- Contaminant classes and major compounds or elements identified in soil/fill
- Ranges and maximum concentrations
- Table of sampling results and ranked data tables

2.5.4.2 COMPARISON OF SOIL/FILL WITH SCGS

- Relationship of findings to SCGs and/or SCOs (Part 375-6)
 - Table of exceedances of Track 1 SCOs (Part 375-6)
 - This can be linked with Table in Section 2.4.4.1.
 - Map of exceedances of Track 1 SCOs (Part 375-6) (spider map)

Note: contact NYSDEC for input on appropriate comparison

- Describe the relationship of soil contamination to original sources
- Present conclusions

The following text should be included somewhere in this section:

Table [x] shows exceedances from Track 1 Unrestricted SCOs for all soil/fill at the Site. Figure [x] is a spider map that shows the location and summarizes exceedances from Track 1 Unrestricted SCOs for all soil/fill.

2.5.5 ON-SITE AND OFF-SITE GROUNDWATER CONTAMINATION

2.5.5.1 SUMMARY OF GROUNDWATER DATA

- Contaminant classes and major compounds or elements identified in groundwater
- Ranges and maximum concentrations
- Table of sampling results

2.5.5.2 COMPARISON OF GROUNDWATER WITH SCGS

- Table of exceedances of Class GA Ambient Water Quality Standards (see Appendix 1 of this document)
 - This can be linked with Table in Section 2.4.5.2.
- Map of exceedances of GA Standards (provide spider map)
- Information necessary to support groundwater components of the Monitoring Plan
- Relationship of groundwater contamination to original sources
- Conclusions

The following text should be included somewhere in this section:

A table that indicates exceedances of Class GA Ambient Water Quality Standards (AWQS) in monitoring wells prior to the remedy is shown in Table [x]. A spider map that indicates the location(s) of and summarizes exceedances of AWQS prior to the remedy is shown in Figure [x].

2.5.6 ON-SITE AND OFF-SITE SOIL VAPOR CONTAMINATION

- Summary of soil vapor data
 - Contaminant classes and major compounds in ambient air, indoor air, soil vapor and sub-slab soil vapor;
 - Ranges and maximum concentrations;
 - Table of sampling results;

- Map of data (spider map).

2.5.6.1 COMPARISON OF SOIL VAPOR WITH SCGS

- Table and map of detections (only compare to NYSDOH guidance values if co-located sub-slab and indoor air samples have been collected)
- Information necessary to support soil vapor components of the Monitoring Plan
- Relationship of soil vapor contamination to original sources
- Conclusions
- The following text should be included somewhere in this section:

A table of soil vapor data collected prior to the remedy is shown in Table [x]. A spider map that indicates the location(s) of and summarizes soil vapor data prior to the remedy is shown in Figure [x].

2.5.7 [OTHER MEDIA]

Add additional sections as necessary for other pertinent environmental media or features, such as surface water and sediment, underground piping, vaults, etc.

2.6 Environmental and Public health assessments

2.6.1 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

This section should include a description and the results of the Qualitative Human Health Exposure Assessment.

- Existence and potential sources of soil, groundwater and soil vapor contamination on the Site;
- Vertical and horizontal nature and extent of contamination in on-Site soils, on- and off-Site groundwater and vapor plumes;
- Fate and transport of contaminants.

- Exposure pathways: Potential routes of exposure by receptors;
- Existence of human exposure to Site-related contaminants under current or reasonably foreseeable conditions
- Receptor populations
- Human health exposure assessment

2.6.2 FISH & WILDLIFE REMEDIAL IMPACT ANALYSIS

If required by Site conditions and surrounding natural resources. See Section 3.10 of DER-10 for guidance.

2.7 Interim Remedial Action

This section should include a comprehensive description of any IRMs that have been performed at the Site.

2.8 Remedial Action Objectives

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) have been identified for this Site.

Include all RAOs that are appropriate, as follows

2.8.1 GROUNDWATER

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer, to the extent practicable, to pre-disposal/pre-release conditions.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

2.8.2 SOIL

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of, or exposure to, contaminants volatilizing from contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

2.8.3 SURFACE WATER

RAOs for Public Health Protection

- Prevent ingestion of contaminated water.
- Prevent contact or inhalation of contaminants from impacted water bodies.
- Prevent surface water contamination that may result in fish advisories.

RAOs for Environmental Protection

- Restore surface water to ambient water quality standards for each contaminant of concern.

- Prevent impacts to biota due to ingestion/direct contact with contaminated surface water that would cause toxicity or bioaccumulation through the marine or aquatic food chain.

2.8.4 SEDIMENT

RAOs for Public Health Protection

- Prevent direct contact with contaminated sediments.
- Prevent surface water contamination that may result in fish advisories.

RAOs for Environmental Protection

- Prevent release(s) of contaminant(s) from sediments that would result in surface water levels in excess of (ambient water quality criteria).
- Prevent impacts to biota due to ingestion/direct contact with contaminated sediments that would cause toxicity or bioaccumulation through the marine or aquatic food chain.
- Restore sediments to pre-release/background conditions to the extent feasible.

2.8.5 SOIL VAPOR

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the Site.

3.0 Description of Remedial Action Plan

3.1 Evaluation of remedial alternatives

This section should include a description of the remedial alternatives, a comparison of the alternatives and the Remedial Action standards, criteria and guidance. At a minimum, the Track 1 remedial alternative must be presented and considered in this evaluation. The factors to be considered during this analysis of remedial alternatives are (include a section for each):

- Protection of human health and the environment;
- Compliance with standards, criteria, and guidelines (SCGs);
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance;
- Green and Sustainable Remediation (including climate resiliency); and
- Land use.

Generally, the most relevant of the nine criteria for evaluating sustainable or green components of a remedial action alternatives will be short-term effectiveness, one of the primary balancing criteria. Also, consider evaluating sustainable or greener cleanup activities under any of the other eight criteria as part of the remedy selection process (such as the "long term effectiveness and permanence" and "cost" balancing criteria and the "community acceptance" modifying criterion).

Consider potential land uses such as greenways and pollinator habitats, as appropriate. Greenways and pollinator habitats may improve the ecosystem and result in fewer greenhouse gas emissions due to operation and maintenance. For example, landfill caps may be created as/converted to pollinator habitats to reduce the need for mowing.

Implement remedies in a more energy-efficient manner. There may be equally protective ways to implement the selected remedy such that it uses dramatically less electricity or fuel. Examples include:

- in-situ groundwater treatment and bioremediation that use materials generated near the site; and
- reuse of the heat generated as part of treatment for other purposes on-site.

Use Cleaner and More Energy-Efficient Equipment and Construction Techniques.

Examples include:

- use high efficiency, variable speed pumps for groundwater extraction and treatment plant operations;
- optimize pump-and-treat systems to minimize excess extraction or energy usage;
- use the extracted groundwater to provide heating and cooling (through heat exchangers) of the structure housing a pump-and-treat system;
- thoroughly insulate structures such as treatment plants;
- design structures to take full advantage of passive solar heating and cooling;
- use 2007 or newer diesel trucks or retrofitted diesel trucks with equivalent emissions reductions that get better fuel mileage. reduce air toxics. and/or use low sulfur fuel or alternative fuel;
- include idling restrictions on all construction equipment on the site such as meeting idling regulations, or in the absence of such regulations, limiting engine idling time to less than three minutes in any sixty-minute period;
- use EPA Tier 2 or higher non-road construction equipment or non-road construction equipment retrofitted with EPA-verified technology to meet equivalent emissions reductions. (This equipment is readily available as much of it has been in the market since 2007.); and/or
- use resource recovery in construction projects (e.g., recycling steel and other materials from demolition projects as appropriate)

Use more sustainable materials: The choice of cleanup materials can have a profound impact on the project's overall environmental footprint. For example, many projects require a significant amount of concrete (e.g., for the construction of an onsite

treatment plant or storage pads, etc.). Concrete generally has a relatively high carbon footprint, primarily because manufacture of the Portland cement that hardens and binds it together is very energy intensive. Examples of sustainable materials include:

- o Reused PVC pipe;
- o Green concrete;
- o Sustainable building materials; and/or
- o Plant native vegetation.

Generate renewable energy on-site: In some situations, electricity can be generated on-site using wind, solar, or geothermal energy. For example:

- o electricity generated onsite by windmills and solar arrays can be used to drive pumps. In appropriate settings, fans for vapor intrusion mitigation systems can be powered by roof-top solar panels or wind-driven vacuum systems; and/or
- o Captured landfill gas (methane) can be used to produce energy at closed landfills.

Other approaches and/or considerations may be included with the approval of NYSDEC's Project Manager.

3.2 Selection of the Preferred Remedy

This section should describe the preferred remedy and summarize it according to the criteria previously defined. The following land use factor evaluation should examine whether an alternative is acceptable based on the following criteria (below) as required by Article 27, Title 14 of the Environmental Conservation Law 27-1415. This evaluation should be applied directly to the preferred alternative and the report should dedicate a subsection to each of the bulleted items below.

3.2.1 ZONING;

Note: add text to this and all following sub-sections.

3.2.2 APPLICABLE COMPREHENSIVE COMMUNITY MASTER PLANS OR LAND USE PLANS

3.2.3 SURROUNDING PROPERTY USES

3.2.4 CITIZEN PARTICIPATION

3.2.5 ENVIRONMENTAL JUSTICE

3.2.6 PROXIMITY TO NATURAL RESOURCES

3.2.11 OFF-SITE GROUNDWATER IMPACTS

3.2.12 PROXIMITY TO FLOODPLAINS

3.2.13 CURRENT INSTITUTIONAL CONTROLS

3.3 Summary of selected Remedial Actions

When preparing this section, be advised that Remedial Actions must stop off-Site migration of mobile contamination emanating from the Site to the maximum extent practicable. This will include halting future off-Site migration of groundwater and soil vapor contamination. If a Track 4 remedy is proposed, numerical values must be proposed in the RAWP by the Applicant. The basis (starting point) for these numbers should be the Track 2 SCOs listed in Part 375-6 for the appropriate land-use type for the Site end use. The lowest possible numbers should be proposed. This section must include a comprehensive and concise summary of the Remedial Action proposed for the Site and should include a numbered bullet list of remedial elements. This may be identical to the description provided in the Executive Summary. Examples are listed below and may be used, if appropriate.

1. Excavation of soil/fill exceeding Track [4] SCOs listed in Table [x];

2. Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site work;
3. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track [4] SCOs;
4. Appropriate off-Site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;
5. Import of materials to be used for backfill and cover in compliance with: (1) chemical limits and other specifications included in Table [x], (2) all Federal, State and local rules and regulations for handling and transport of material;
6. Construction and maintenance of a site cover consisting of [summary of cover types] to prevent human exposure to residual contaminated soil/fill remaining under the Site;
7. Recording of an Environmental Easement, including Institutional Controls, to prevent future exposure to any residual contamination remaining at the Site (a copy of the Environmental Easement is provided in Appendix [x]);
8. Publication of a Site Management Plan for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;
9. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the NYSDEC-issued Decision Document [add IRMs if appropriate]. All deviations from the RAWP and/or Decision Document will be promptly reported to NYSDEC for approval and fully explained in the FER.

Note: this and later sections must be complete to provide a basis for comparison of all Remedial Actions performed and reported later in the FER. It should provide all details necessary to direct the remedy and evaluated its performance.

4.0 Remedial Action Program

4.1 Governing Documents

Governing documents should be introduced and discussed generally. Greater detail is provided later in the body of this document and/or in the Appendix. Key highlights of all plans must be included here. Copies of all plans should be included in full within the Appendix.

4.1.1 STANDARDS, CRITERIA AND GUIDANCE (SCGS)

The following standards, criteria, and guidance are typically applicable to Remedial Action projects in New York State, and will be consulted and adhered to as applicable:

- 6 NYCRR Part 364 - NYS Waste Transporter Permits
- 6 NYCRR Part 360 - NYS Solid Waste Management Requirements
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Subpart 374-2 - Standards for the Management of Used Oil
- 6 NYCRR Part 375 - Environmental Remediation Programs
- 6 NYCRR Part 376 - Land Disposal Restrictions
- 6 NYCRR Part 613 - Petroleum Bulk Storage
- 6 NYCRR Part 661 - Tidal Wetlands - Land Use Regulations
- 6 NYCRR Part 663 - Freshwater Wetlands - Permit Requirements
- 6 NYCRR Parts 700-706 – Classes and Standards of Quality and Purity
- 6 NYCRR Part 750 - State Pollutant Discharge Elimination System (SPDES) Permits
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- 40 CFR Part 144 - Underground Injection Control Program

- CP-43 - Commissioner Policy on Groundwater Monitoring Well Decommissioning (December 2009)
- CP-49 – Climate Change and DEC Action (2022)
- CP-51- Soil Cleanup Guidance (2010)
- CP-60 – Screening and Assessment of Contaminated Sediment (2014)
- DER-2 - Making Changes to Selected Remedies (April 2008)
- DER-4 – Management of Coal Tar Waste & Coal Tar Contaminated Soils from Manufactured Gas Plants (2001)
- DER-10 – Technical Guidance for Site Investigation and Remediation (2010)
- DER-13 – Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York (2006)
- DER-23 – Citizen Participation Handbook for Remedial Programs (2010)
- DER-31 – Green Remediation (2010)
- DER-32 – Brownfield Cleanup Program Applications and Agreements (2017)
- DER-33 – Guide to Drafting and Recording Institutional Controls (2010)
- TAGM 3028 - "Contained In" Criteria for Environmental Media: Soil Action Levels (August 1997)
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations (1998, Addenda 2000, 2004 and 2023)
- TOGS 1.3.8 - New Discharges to Publicly Owned Treatment Works (1994)
- TOGS 2.1.2 - Underground Injection/Recirculation (UIR) at Groundwater Remediation Sites (1990)
- New York State Standards and Specifications for Erosion and Sediment Control (2016)

- DAR-1 (formerly Air Guide 1) - Guidelines for the Control of Toxic Ambient Air Contaminants (1997)
- U.S. EPA OSWER Directive 9200.4-17 - Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (December 1997)
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)
- New York State Climate Act (2019)
- NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (2023)

4.1.1.1 Green and Sustainable Remediation and Climate Resiliency

DER-31: Green Remediation provides the framework for DER's approach to remediating sites in the context of the larger environment, a concept known as “Green Remediation”. Green Remediation (or greener cleanups) can be defined as “the practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprint of cleanup actions.” It is intended to be a holistic approach which improves the overall sustainability of remedial cleanups by promoting the use of more sustainable practices and technologies. Such practices and technologies are less disruptive to the environment, generate less waste, increase reuse and recycling, and emit fewer pollutants, including greenhouse gases (GHGs), to the atmosphere. The approach also recognizes the potential for positive economic and social benefits of site reuse and supports coordination of site reuse and remediation to affect the most beneficial and sustainable reuse of the site. Please note that final end use is dictated by local zoning codes. DEC’s role is to ensure that the remedy is protective for the intended end use.

The Remedial Action program should build off the sustainable or greener cleanup activities evaluated during the RI. However, if the relevant evaluations were not performed, then similar

considerations discussed in earlier sections of this document should be evaluated at this stage.

Other considerations:

- Require a Green Remediation Implementation Plan submittal from the selected Contractor to detail procedures and tracking of these items;
- Require a Climate Screening- a high level desktop review of the site and potential changes in climate hazards. If the screening identifies potential exposure to climate hazards, a Climate Vulnerability Assessment (CVA) will need to be conducted. A CVA will identify adaptation measures to account for projected climate hazard exposures.
- For sites susceptible to climate change, require a Climate Adaptation Plan, which will incorporate findings and recommendations from the Climate Vulnerability Assessment;
- During construction activities and associated landscape alteration activities, green building strategies such as those outlined in the USGBC LEED should be considered. LEED includes guidelines and recommendations for new construction, and existing building operations and management that fall under six categories important for reducing the environmental impact of facilities of all types:
 - Sustainable sites
 - Water efficiency
 - Energy and atmosphere
 - Materials and resources
 - Indoor environmental quality
 - Innovation in operations
- As noted across the LEED categories, resources other than energy that can be conserved include water, raw materials for materials consumed, topsoil, paper for reports, and landfill space. Conserving one resource typically conserves other resources and has other sustainability benefits. For example, recycling of

construction and demolition debris or metal will reduce consumption of landfill space and may also save energy and reduce air emissions by reducing material transportation. Another example is the use of waste-to-energy plants for waste disposal rather than landfills in states where these plants are currently operating. This also reduces the consumption of landfill space and results in energy production from the waste processing. Other examples of resource conservation include treated water reinjection, the reuse of treated soil onsite, and the beneficial reuse of sediments.

- The use of “green” construction and project management products and materials such as ecofriendly concrete or the use of native plants for site restoration also advances the sustainability objectives of the project. It is important to understand that green remediation implies minimizing the entire footprint of the remediation project, which includes the environmental impacts of products and materials associated with the project. For example, eco-friendly concrete generally refers to concrete that is produced with a certain percentage of fly-ash (a waste product from the coal-firing process). This type of “green” concrete takes a problematic substance out of the waste stream and reduces the cumulative amount of energy associated with the production of concrete. The use of native plants for site restoration helps to conserve water and eliminate the need for potentially harmful fertilizers and pesticides.

Other approaches or considerations may be approved by NYSDEC on a case-by-case basis.

4.1.2 SITE SPECIFIC HEALTH & SAFETY PLAN (HASP)

The HASP must be submitted with the RAWP. This document should be submitted under a separate cover. This may refer to and incorporate the CAMP, however the CAMP must be included in its entirety in the RAWP.

The following text should be included somewhere in this section:

All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

The [Volunteer/Participant] and associated parties preparing the remedial documents submitted to the State and those performing the construction work, are completely responsible

for the preparation of an appropriate Health and Safety Plan and for the appropriate performance of work according to that plan and applicable laws.

The Health and Safety Plan (HASP) and requirements defined in this Remedial Action Work Plan pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

The Site Safety Coordinator will be [identify by name]. A resume will be provided to NYSDEC prior to the start of remedial construction.

Confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses.

4.1.3 QUALITY ASSURANCE PROJECT PLAN (QAPP)

This document must include proposed sampling and analytical methods for end-point sampling.

4.1.4 CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)

The Construction Quality Assurance Plan (CQAP) must be part of the RAWP. This plan must describe how the successful performance of the Remedial Action tasks will be assured through designed and documented QA/QC methodologies applied in the field and in the lab. The CQAP will provide a detailed description of the observation and testing activities that will be used to monitor construction quality and confirm that remedy construction is in conformance with the remediation objectives and specifications. The CQAP should include:

- Responsibilities and authorities of the organizations and key personnel involved in the design and construction of the remedy.
- Qualifications of the quality assurance personnel that demonstrate that they possess the proper training and experience necessary to fulfill project-specific responsibilities.
- The observations and tests that will be used to monitor construction and the frequency of performance of such activities.

- The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for implementing corrective measures as addressed in the plans and specifications.
- Requirements for project coordination meetings between the Applicant and its representatives, the Construction Manager, Excavation Contractor, remedial or environmental subcontractors, and other involved parties.
- Description of the reporting requirements for quality assurance activities including such items as daily summary reports, schedule of data submissions, inspection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation.
- Description of the final documentation retention provisions.

4.1.5 SOIL/MATERIALS MANAGEMENT PLAN (SOMP)

This document must be part of the RAWP (it is built into the body of the RAWP in section 5.4) and must include detailed plans for managing all soils/materials that are disturbed at the Site, including excavation, handling, storage, transport and disposal. It must also include all of the controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations.

4.1.6 STORM-WATER POLLUTION PREVENTION PLAN (SWPPP) [OR EROSION AND SEDIMENT CONTROL PLAN (ESCP)]

Either a SWPPP (if the site is greater than 1 acre in size) or the ESCP must be part of the RAWP and must address requirements of New York State Storm-Water Management Regulations including physical methods to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soils, via wind or water.

The following text should be included somewhere in this section:

The erosion and sediment controls will be in conformance with requirements presented in the New York State Standards and Specifications for Erosion and Sediment Control.

4.1.7 COMMUNITY AIR MONITORING PLAN (CAMP)

This document must be part of the RAWP.

4.1.8 CONTRACTORS SITE OPERATIONS PLAN (SOP);

The following text should be included somewhere in this section:

The Remedial Engineer has reviewed all plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and confirms that they comply with this RAWP. The Remedial Engineer is responsible to ensure that all later document submittals for this remedial project, including contractor and sub-contractor document submittals, comply with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

If a formal Remedial Design is required, it should incorporate all of the elements identified for this RAWP into a set of biddable quality plans and specifications. The final design submittal of these plans and specifications must be signed and stamped by a NYS licensed professional engineer. Add the following text, if appropriate:

A detailed remedial construction design document will be submitted to NYSDEC for approval in [date].

4.1.9 CITIZEN PARTICIPATION PLAN

This Section should summarize the pertinent elements of the Citizen Participation Plan addressed during preparation of the RAWP and those that pertain to the remainder of the remedial program.

The following text should be included somewhere in this section:

A certification of mailing will be sent by the [Volunteer/Participant] to the NYSDEC project manager following the distribution of all Fact Sheets and notices that includes: (1) certification that the Fact Sheets were mailed, (2) the date they were mailed; (3) a copy of the Fact Sheet, (4) a list of recipients (contact list); and (5) a statement that the repository was inspected on [specific date] and that it contained all of applicable project documents.

No changes will be made to approved Fact Sheets authorized for release by NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the Fact Sheet mailing.

The approved Citizen Participation Plan for this project is attached in Appendix [x].

Document repositories have been established at the following locations and contain all applicable project documents:

[repository name]

[repository address]

[repository phone number]

[repository hours]

In addition, an electronic repository can be accessed via DECInfo Locator at the following link: [add direct link to document folder].

4.2 General Remedial construction information

4.2.1 PROJECT ORGANIZATION

This section should include a list of people who will be responsible for Remedial Action work.

An organization chart is included in Figure [x].

Resumes of key personnel involved in the Remedial Action are included in Appendix [x].

4.2.2 REMEDIAL ENGINEER

The following text should be included somewhere in this section:

The Remedial Engineer for this project will be [insert name here]. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the [Site name] Site (NYSDEC BCA Index No. Xx-xxxx-xx-xx Site No. Cxxxxxx). The Remedial Engineer will certify in the Final Engineering Report that the remedial activities were observed

by qualified environmental professionals under [his/her] supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

The Remedial Engineer will coordinate the work of other contractors and subcontractors involved in all aspects of remedial construction, including soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services, import of back fill material, and management of waste transport and disposal. The Remedial Engineer will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The Remedial Engineer will review all pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the Final Engineering Report.

The Remedial Engineer will provide the certifications listed in Section 10.1 in the FER.

4.2.3 REMEDIAL ACTION CONSTRUCTION SCHEDULE

A schedule for performance of the remedial work is required, preferably in the form of a Gantt chart. It must be broken down into Remedial Action elements and may be developed based on elapsed time from approval by NYSDEC.

4.2.4 WORK HOURS

The following text should be included somewhere in this section:

The hours for operation of remedial construction will conform to the [municipality name] Department of Buildings (DOB) construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the [Applicant / Volunteer / Participant] of any variances issued by DOB. NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 SITE SECURITY

4.2.6 TRAFFIC CONTROL

4.2.7 CONTINGENCY PLAN

4.2.8 WORKER TRAINING AND MONITORING

This should include HAZWOPER, site safety training and medical monitoring for site workers.

4.2.9 AGENCY APPROVALS

The following text should be included somewhere in this section:

The [Applicant / Volunteer / Participant] has addressed all SEQRA requirements for this Site. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction.

The planned end use for the Site is in conformance with the current zoning for the property as determined by [local zoning or planning agency, i.e., New York City Department of City Planning] [or: Evidence to show that the planned use conforms to zoning designations will be provided to the NYSDEC prior to issuance of a COC.] A Certificate of Completion will not be issued for the project unless conformance with zoning designation is demonstrated.

A complete list of all federal, state and local governmental permits, certificates or other approvals or authorizations required to perform the remedial and development work is attached in Table [x]. This list includes a citation of the law, statute or code to be complied with, the originating agency, and a contact name and phone number in that agency. This list will be updated in the Final Engineering Report.

All planned remedial or construction work in regulated wetlands and adjacent areas will be specifically approved by the NYSDEC Division of Natural Resources to ensure that it meets the requirements for substantive compliance with those regulations prior to the start of construction. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

4.2.10 NYSDEC BCP SIGNAGE

Signs are optional for BCP sites and should be discussed with the NYSDEC Project Manager. If a sign is to be displayed, it must follow NYSDEC specifications for design and content. The NYSDEC Project Manager can provide details on signage protocol.

If a sign is to be displayed at the site, the following text should be included somewhere in this section:

A project sign will be erected at the main entrance to the Site prior to the start of any remedial activities. The sign will indicate that the project is being performed under the New York State Brownfield Cleanup Program. The sign will meet the detailed specifications provided by the NYSDEC Project Manager and contained in Appendix [x].

4.2.11 PRE-CONSTRUCTION MEETING WITH NYSDEC

This meeting must take place prior to the start of major construction activities.

4.2.12 EMERGENCY CONTACT INFORMATION

An emergency contact sheet with names and phone numbers is included in Table [x]. That document will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

4.2.13 REMEDIAL ACTION COSTS

The following text should be included somewhere in this section:

The total estimated cost of the Remedial Action is [insert value]. An itemized and detailed summary of estimated costs for all remedial activity is attached as Appendix [x]. This will be revised based on actual costs and submitted as an Appendix to the Final Engineering Report.

The only costs that should be included in the Remedial Action Work Plan should apply directly to the planned remedy. Redevelopment related tasks should not be considered including non-contaminated building demolitions, sheeting and shoring for subgrade development, and excavation of soils meeting the proposed use soil cleanup objectives, etc.

4.3 Site Preparation

4.3.1 MOBILIZATION

4.3.2 MONITORING WELL / VAPOR PROBE DECOMMISSIONING

The following text should be included somewhere in this section:

Existing groundwater monitoring wells will either be protected during remediation and development for use in post-remedial monitoring or will be properly decommissioned in accordance with NYSDEC Commissioners Policy CP-43. The only exception to this is if the full length of the well is to be excavated during remediation.

Similarly, existing soil vapor probes will be properly decommissioned unless they are to be fully removed during remediation or used for post-remedial monitoring.

4.3.3 EROSION AND SEDIMENTATION CONTROLS

4.3.4 STABILIZED CONSTRUCTION ENTRANCE(S)

Show continuity between the truck wash and the stone-based egress path so that trucks do not get re-contaminated prior to departure from the Site.

4.3.5 UTILITY MARKER AND EASEMENTS LAYOUT

The following text should be included somewhere in this section:

The [Applicant / Volunteer / Participant] and its contractors are solely responsible for the identification of utilities that might be affected by work under the RAWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this RAWP. The [Applicant / Volunteer / Participant] and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The [Applicant / Volunteer / Participant] and its contractors must obtain any local, State or Federal permits or approvals pertinent to such work that may be required to perform work under this RAWP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site.

4.3.6 SHEETING AND SHORING

The following text should be included somewhere in this section:

Appropriate management of structural stability of on-Site or off-Site structures during on-Site activities include excavation is the sole responsibility of the [Applicant / Volunteer / Participant] and its contractors. The [Applicant / Volunteer / Participant] and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The [Applicant / Volunteer / Participant] and its contractors must obtain any local, State or Federal permits or approvals that may be required to perform work under this RAWP. Further, the [Applicant / Volunteer / Participant] and its contractors are solely responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

4.3.7 EQUIPMENT AND MATERIAL STAGING

4.3.8 DECONTAMINATION AREA

4.3.9 SITE FENCING

4.3.10 DEMOBILIZATION

The Demobilization plan should address:

- Restoration of areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management area[s], and access area);
- Removal of temporary access areas (whether on-Site or off-Site) and restoration of disturbed access areas to pre-remediation conditions;
- Removal of sediment and erosion control measures and disposal of materials in accordance with acceptable rules and regulations;

- Equipment decontamination;
- General refuse disposal.

4.4 Reporting

The following text should be included somewhere in this section:

All daily and monthly Reports will be included in the Final Engineering Report.

4.4.1 DAILY REPORTS

The following text should be included somewhere in this section:

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers by noon of each day following the reporting period and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP finding, including excursions;
- Photographs of site activities;
- An explanation of notable Site conditions.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports. Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

Daily Reports will include a description of daily activities keyed to an alpha-numeric map for the Site that identifies work areas. These reports will include a summary of CAMP results, odor and dust excursions and corrective actions, and all complaints received from the public.

A Site map that shows a predefined alpha-numeric grid for use in identifying locations described in reports submitted to NYSDEC is attached in Figure [x].

The NYSDEC assigned project number will appear on all reports.

4.4.2 MONTHLY REPORTS

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th day of each month following the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (e.g., tons/cubic yards of material exported and imported, etc.);
- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and,
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.
- Tracking of GSR metrics determined during the design process should be included in monthly reports.

4.4.3 OTHER REPORTING

The following text should be included somewhere in this section:

Photographs will be taken of all remedial activities and submitted to NYSDEC in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the Site prior to any Remedial Actions will be provided. Representative photos will be provided of each contaminant source, source area and Site structures before, during and after remediation. Photos will be included in the daily reports as needed, and a comprehensive collection of photos will be included in the FER.

Progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the FER, including a comparison to the goals established during the remedial program. Regular updates to the metrics used (SEFA, SiteWise™ or otherwise approved method) should be included.

The Climate Screening process and results will be documented in the form of a completed checklist and brief letter report. If the Climate Screening results indicate that a CVA is necessary, a complete CVA Report will be developed. The CVA Report will be included as an Appendix or Attachment in relevant documents and/or submitted as a standalone report.

Job-site record keeping for all remedial work will be appropriately documented. These records will be maintained on-Site at all times during the project and be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 COMPLAINT MANAGEMENT PLAN

This section should discuss the procedures for handling complaints from the public regarding nuisance or other Site conditions.

4.4.5 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

This section should provide a complete description of the process to be followed if there are any deviations from the RAWP. At a minimum, this section should include the following:

- Reasons for deviating from the approved RAWP;
- Approval process to be followed for changes/editions to the RAWP;
- Effect of the deviations on overall remedy.

5.0 Remedial Action: Material Removal from Site

The introduction to this section should generally introduce plans for removal of all contaminated media (soil, water, structures, etc) under the Remedial Action. It should also include a description and identification (including a map) of: the location of remedial treatment units; the volume of each environmental medium to be remediated; the location, depth and concentration of all contaminants in excess of the remediation standard; sample locations, depths and parameters for all post-construction samples. The RAWP must also include a Quality

Assurance Project Plan describing the proposed sampling and analytical methods and a list of all required permits (or substantive permit requirements).

Materials and Waste Management should consider greener and sustainable approaches related to both the purchase of greener products and material reuse or recycling versus disposal wherever practical.

In the purchase of greener products consider:

- Exploring options for reusing materials onsite or available from local sources;
- Purchasing from local vendors who accept unused materials upon project completion;
- Designing for optimized product sizing and product ordering and for future reuse or repurposing; and
- Choosing environmentally preferable products.

For material reuse or recycling versus disposal consider:

- Verifying acceptable reuse of C&D materials with regulators;
- Screening recyclers and waste haulers;
- Evaluating environmental trade-offs;
- Specifying requirements and goals in service contracts;
- Salvaging uncontaminated demolition and other materials with value for reuse/recycling, resale, or donation;
- Onsite or offsite reuse of industrial materials such as crushed concrete and shredded scrap tires for remedy construction;
- Recycling routine single-use items;
- Minimizing direct or indirect use of fossil fuels during activities such as product purchasing or waste transfer; and
- Planning treatment process optimization and monitoring that includes sustainable materials management.

Other approaches and/or considerations may be included with the approval of NYSDEC's Project Manager.

5.1 Soil Cleanup Objectives

This should include a list of the SCOs for the Site. It is strongly recommended that for projects pursuing Track 1, a contingency Track 4 SCO list be developed in the RAWP to act as a fallback plan if Track 1 values cannot be achieved on the Site. The following text should be included somewhere in this section:

The Soil Cleanup Objectives for this Site are listed in Table [x].

Soil and materials management on-Site and off-Site will be conducted in accordance with the Soil/Materials Management Plan as described below.

Table [x] summarizes all soil samples that exceed the SCOs proposed for this Remedial Action. A spider map that shows all soil samples that exceed the SCOs proposed for this Remedial Action is shown in Figure [x].

UST closures will, at a minimum, conform to criteria defined in DER-10.

5.2 Remedial Performance Evaluation (Post Excavation End-Point Sampling)

This sampling should be summarized here.

5.2.1 END-POINT SAMPLING FREQUENCY

See Section 5.4 of DER-10 for guidance on sampling frequency.

5.2.2 METHODOLOGY

This section should describe how and where endpoint samples should be collected. For example, bottom end-point samples should be collected from the base of the REMEDIAL excavation, not the bottom of the development excavation.

5.2.3 REPORTING OF RESULTS

5.2.4 QA/QC

5.2.5 DUSR AND EDDS

5.2.6 REPORTING OF END-POINT DATA IN FER

- This section should describe what will be reported in the FER. At a minimum, the FER must include a table of end point data with highlights or a summary of exceedances of SCOs. A spider map showing all SCO exceedances should also be presented in the FER.

The following text should be included somewhere in this section:

Chemical labs used for all end-point sample results and contingency sampling will be NYSDOH ELAP certified.

End point sampling, including bottom and side-wall sampling, will be performed in accordance with DER-10 sample frequency requirements. Side-wall samples will be collected a minimum of every [insert number] linear feet. Bottom samples will be collected at a rate of one for every [insert number] square feet from the base of the remedial excavation. The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs.

5.3 Estimated Material Removal Quantities

This section should describe the media to be removed that is required for remediation and the following:

- Criteria to govern material removal;
- Volume/mass of material to be removed;
- Locations from which materials were removed:
 - Scaled maps of excavation areas and types of materials removed
 - Vertical and horizontal extent
- Cut/Fill thickness maps: these maps (2; one for cut and one for fill) should show where all soils/material are expected to be removed from with approximate thickness (in

contours) and where imported soils/material are expected to be placed. This is should be done in two separate maps.

The following text should be included somewhere in this section:

The estimated quantity of soil/fill to be removed from the Site is [X] tons/cubic yards. The estimated quantity of soil to be imported into the Site for backfill and cover soil is [X] tons/cubic yards. The estimated quantity of soil/fill expected to be reused/relocated on Site is [X] tons/cubic yards.

5.4 SOIL/MATERIALS MANAGEMENT PLAN

Describe the elements of the Soil Management Plan.

5.4.1 SOIL SCREENING METHODS

Soil screening methodology and sub-slab screening methods should be described here. The following text should be included somewhere in this section:

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional or experienced field geologist under the direction of the Remedial Engineer during all remedial and development excavations into known or potentially contaminated material. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy and during development phase, such as excavations for foundations and utility work, prior to issuance of the COC.

All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps in the FER.

Screening will be performed by qualified environmental professionals. Resumes will be provided for all personnel responsible for field screening (e.g., those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work.

5.4.2 STOCKPILE METHODS

Field generation of contaminated or uncontaminated dust and mobilization of volatile organic compounds can be reduced by new and traditional BMPs such as:

- Covering excavated areas with biodegradable fabric that also can control erosion and serve as a substrate for favorable ecosystems, or with synthetic material that can be reused for other onsite or offsite purposes;
- Spraying water in vulnerable areas, in conjunction with water conservation and runoff management techniques;
- Securing and covering material in open trucks while hauling excavated material, and reusing the covers;
- Revegetating excavated areas as quickly as possible; and
- Limiting onsite vehicle speeds to 10 miles per hour.

Other approaches and/or considerations may be included with the approval of NYSDEC's Project Manager.

This section should provide details describing erosion and sedimentation controls for stockpiles. A map should be provided of stockpile locations. The following text should be included somewhere in this section:

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. At a minimum, a storm event should be considered a rainfall of three inches or greater in 12 hours. Judgement should be used to evaluate water infiltration, nearby waterbodies where runoff is likely, and engineering controls that may be affected.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Soil stockpiles will be continuously encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

A dedicated water truck equipped with a water cannon will be available on-Site for dust control. [Alternate language: Water will be available on-site at suitable supply and pressure for use in dust control.]

5.4.3 MATERIALS EXCAVATION AND LOAD OUT

Diesel fuel consumption by heavy construction machinery and equipment can be conserved by:

- Selecting suitably sized and typed equipment for tasks;
- Instructing workers to avoid engine idle and using machinery with automatic idle-shutdown devices;
- Employing auxiliary power units to power cab heating and air conditioning when a machine is unengaged;
- Performing routine, on-time maintenance such as oil changes to improve fuel efficiency; and
- Repowering an engine or replacing it with a newer, more efficient model.

Fuel consumed during transfer of excavated soil or other materials to landfills can be reduced by:

- Selecting the closest waste receiver;
- Investigating alternate shipping methods such as rail lines; and
- Identifying opportunities for resource sharing with other waste haulers.

Greenhouse gas (GHG) and particulate matter (PM) emissions from mobile sources can be reduced through use of:

- Equipment retrofits involving low-maintenance multi-stage filters for cleaner engine exhaust;

- Cleaner fuel such as ultra-low sulfur diesel, wherever available (and as required by engines with PM traps); and
- use of biodiesel, particularly if made from recycled byproducts.

Other approaches and/or considerations may be included with the approval of NYSDEC's Project Manager.

This section should describe all methods to be followed for materials loading and on-Site management prior to leaving the Site. The following text should be included somewhere in this section:

The Remedial Engineer or a qualified environmental professional under his/her supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The [Applicant / Volunteer / Participant] and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

Vehicles leaving the Site will not be overloaded. The Remedial Engineer's representative will make reasonable efforts to ensure that vehicles are not loaded beyond their NYSDOT weight rating and that all material is secured beneath the truck bed cover.

A truck wash will be operated on-Site. The Remedial Engineer will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the remedial construction is complete.

Note: The applicant may propose a different decontamination method; however, it must be approved by the DEC PM prior to implementation.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-Site sediment tracking.

The Remedial Engineer will be responsible for ensuring that all egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site -derived materials.

The [Applicant / Volunteer / Participant] and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

The Remedial Engineer will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this Remedial Action Work Plan.

Each hotspot and structure to be remediated (USTs, vaults and associated piping, transformers, etc.) will be removed and end-point remedial performance sampling completed before excavations related to Site development commence proximal to the hotspot or structure.

Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this plan.

Mechanical processing of historical fill and contaminated soil on-Site is prohibited.

All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. The survey information will be shown on maps to be reported in the FER.

5.4.4 MATERIALS TRANSPORT OFF-SITE

This section should describe all methods to be followed for materials management while in transport off-Site. The following text should be included somewhere in this section:

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Truck transport routes are as follows [describe route and provide map]. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.

Proposed in-bound and out-bound truck routes to the Site are shown in Figure [x]. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off- Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; [(g) community input [where necessary]]

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-Site in order to minimize off-Site disturbance. Off-Site queuing will be prohibited.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas or mesh truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-Site in an appropriate manner.

5.4.5 MATERIALS DISPOSAL OFF-SITE

This section should describe all methods to be followed for materials disposal off-Site. The following text should be included somewhere in this section:

The disposal locations are [list disposal locations]. Disposal location established at a later date will be reported to the NYSDEC Project Manager.

The total quantity of material expected to be disposed off-Site is [insert quantity; breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc.].

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-Site management of materials from this Site is prohibited without formal NYSDEC approval.

Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360.15 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or BCP [Applicant / Volunteer / Participant] to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

Non-hazardous historic fill and contaminated soils taken off-Site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360.2. The Remedial Engineer is responsible for assuring material is properly characterized and determining the appropriate disposal methods based on the characterization results.

Historical fill and contaminated soils from the Site are prohibited from being disposed at Part 360.15 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the NYSDEC Division of Materials Management (DMM) to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC DMM. This material is prohibited from being sent or redirected to a Part 360-15 Registration Facility. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to on-Site or off-Site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The FER will include an accounting of the destination of all material removed from the Site during this Remedial Action, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

Bill of Lading system or equivalent will be used for off-Site movement of non-hazardous wastes and contaminated soils. This information will be reported in the FER.

Hazardous wastes derived from on-Site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

Waste characterization sampling will be performed exclusively for the purposes of off-Site soil disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws rules and regulations and facility-specific permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC associated with waste

characterization activities will be reported in the FER. All data available for soil/material to be disposed at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt. Waste characterization data will be used solely for complying with requirements for off-site disposal. Waste Characterization sampling cannot be utilized for:

- Delineating the extent of contamination required for remediation at a Site.
- Replacing or substituting data collected as part of Site Characterization and/or Remedial Investigation.
- Replacing or substituting confirmation or documentation sampling as described in NYSDEC DER-10, Section 5.4.
- To modify remedial decisions as formalized in a NYSDEC approved Decision Document or Record of Decision.

5.4.6 MATERIALS REUSE ON-SITE

This section should provide all details for methods to be followed for materials reuse on-Site. 'Reuse on-Site' means reuse on-Site of material that is originally derived from the Site and which does not leave the Site during the remedy. The following topics should be covered:

- Procedure for determining if reuse is appropriate:
 - Sampling (methods and analytical)
 - Chemical limits for on-Site reuse
 - Table of chemical limits for reuse
 - Stockpile segregation scheme for on-Site reuse
 - Size of stockpiles, location (map)

The following text should be included somewhere in this section:

Chemical criteria for on-Site reuse of material have been approved by NYSDEC. These criteria are listed in Table [x]. The Remedial Engineer will ensure that procedures defined for materials reuse in this RAWP are followed and that unacceptable material will not remain on-Site.

A “Request to Import/Reuse Fill Material” form will be filed with the NYSDEC project manager for review and approval prior to material reuse on the site. A copy of the form is presented in Appendix [x]. Acceptable demolition material proposed for reuse on-Site, if any, will be sampled for asbestos.

Concrete crushing or processing on-Site is prohibited, unless NYSDEC has specifically approved on-site processing and reuse of acceptable demolition material.

Note: NYSDEC will consider the use of specially designed devices that are self-contained and capable of providing misting for dust control. NYSDEC approval must be obtained. If dust-free operations are not achieved with such devices, this exception will be revoked.

Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on-Site.

Contaminated on-Site material, including historic fill and contaminated soil, removed for grading or other purposes will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. This will be expressed in the Site Management Plan (SMP).

5.4.7 FLUIDS MANAGEMENT

The following text should be included somewhere in this section:

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by NYCDEP.

Dewatered fluids will not be recharged back to the land surface or subsurface of the Site. Dewatering fluids will be managed off-Site.

Discharge of water generated during remedial construction to surface waters (i.e. a local pond, stream, river and/or storm sewer) is prohibited without a SPDES permit.

5.4.8 DEMARCATION

The following text should be included somewhere in this section:

After the completion of soil removal and any other invasive remedial activities and prior to backfilling, a land survey will be performed by a New York State licensed surveyor. The survey will define the top elevation of residual contaminated soils. A physical demarcation layer, consisting of orange snow fencing material or equivalent material will be placed on this surface to provide a visual reference. This demarcation layer will constitute the top of the 'Residuals Management Zone', the zone that requires adherence to special conditions for disturbance of contaminated residual soils defined in the SMP. The survey will measure the grade covered by the demarcation layer before the placement of cover soils, pavement and sub-soils, structures, or other materials. This survey and the demarcation layer placed on this grade surface will constitute the physical and written record of the upper surface of the 'Residuals Management Zone' in the SMP. A map showing the survey results will be included in the FER and the SMP.

5.4.9 BACKFILL FROM OFF-SITE SOURCES

This section should describe all methods to be followed for import and usage of backfill material from off-Site. The following topics should be covered:

- Source area approval process
 - Sources of backfill material
 - Past usage of Site
 - Source area background check
 - Chemical sampling
 - Analytes
 - Frequency
 - Off-Site backfill approval criteria
 - Table of Backfill Chemical Limits
- Destination proposed for on-Site use of imported backfill
 - Map of backfill locations
- Procedure for determining if reuse is appropriate
 - Sampling (methods and analytical)
 - Chemical limits for imported material

- Stockpile segregation scheme for imported backfill material
 - Size of stockpiles, location (map)

The following text should be included somewhere in this section:

All materials proposed for import onto the Site will be approved by the Remedial Engineer and will be in compliance with provisions in this RAWP prior to receipt at the Site.

Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site. Solid waste will not be imported onto the Site.

The FER will include the following certification by the Remedial Engineer: “I certify that all import of soils from off-Site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan”.

All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. These NYSDEC approved backfill or cover soil quality objectives are the lower of the protection of groundwater or the protection of public health soil cleanup objectives for [site specific use] as set forth in Table 375-6.8(b) of 6 NYCRR Part 375 and listed in Tables [x]. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

Soils that meet ‘general fill’ requirements under 6 NYCRR Part 360.13, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this RAWP should be construed as an approval for this purpose.

A “Request to Import/Reuse Fill Material” form will be filed with the NYSDEC project manager for review and approval prior to import to the site. A copy of the form is presented in Appendix [x].

5.4.10 STORMWATER POLLUTION PREVENTION

A summary of the Stormwater Pollution Prevention Plan that conforms to the requirements of NYSDEC Division of Water guidelines and NYS regulations should be included here. The plan should be included in the Appendix. The following text should appear somewhere in this section:

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the RAWP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the remedial construction area.

5.4.11 CONTINGENCY PLAN

Describe the procedures to be followed upon discovery of an unknown source of contamination or AOC that may require remediation (USTs, stained soil, drums, etc.). Include the following text:

If underground tanks or other previously unidentified contaminant sources are found during on-Site remedial excavation or development related construction, sampling will be performed on product, sediment and surrounding soils, etc. in accordance with DER-10. Chemical analytical

work will be for full scan parameters (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides, PCBs and PFAS). Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

5.4.11.1 Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the [Applicant / Volunteer / Participant] will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from excavated areas, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, hay bales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to NYSDEC at the completion of site inspection and after the site security is assessed. Site

conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911.

Petroleum spills will be reported to NYSDEC within 2 hours of identification and consistent with State regulations. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed.

Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Stormwater control systems and structures will be inspected and maintained as necessary.

If soil or fill materials are discharged off site to adjacent properties, property owners and NYSDEC will be notified, and corrective measure plan designed to remove and clean dislocated material will be submitted to NYSDEC and implemented following approval by NYSDEC and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of NYSDEC.

If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYSDEC's spill hotline at (800) 457-7362 within statutory defined timelines. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYSDEC.

Storm Response Reporting

A site inspection report will be submitted to NYSDEC at the completion of site inspection. An inspection report will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the NYSDEC project manager

and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number.

Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYSDEC; description of corrective actions; schedule for corrective actions.

This report should be completed and submitted to NYSDEC project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.4.12 COMMUNITY AIR MONITORING PLAN

This section should provide all details of the Community Air Monitoring Plan. Guidance can be obtained in Appendix 1A of DER-10, Generic Community Air Monitoring Plan. At a minimum, this section must include:

- Details of the perimeter air monitoring program;
- Action levels to be used;
- Methods for air monitoring;
- Analytes measured and instrumentation to be used;
- A map of the location(s) of all air monitoring instrumentation. A map showing specific locations must be presented for both roving and fixed stations with a note that the exact locations monitored on a given day will be established based on the prevailing wind direction.

The following text should be included somewhere in this section:

A map showing the location of fixed and mobile sampling stations is shown in Figure [x].

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report.

5.4.13 ODOR, DUST AND NUISANCE CONTROL PLAN

This section should describe all methods to be followed for odor, dust and nuisance control.

The following text should be included somewhere in this section:

The FER will include the following certification by the Remedial Engineer: “I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan.”

5.4.13.1 ODOR CONTROL PLAN

The following text should be included somewhere in this section:

This odor control plan is capable of controlling emissions of nuisance odors off-Site [and on-Site, if there are residents or tenants on the property]. Specific odor control methods to be used on a routine basis will include [define elements]. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the [Applicant / Volunteer / Participant]’s Remedial Engineer, who is responsible for certifying the FER.

All necessary means will be employed to prevent on- and off-Site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils; [add other elements as appropriate]. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods [add others as necessary].

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-Site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering excavation and

handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

5.4.13.2 DUST CONTROL PLAN

The following text should be included somewhere in this section:

A dust suppression plan that addresses dust management during invasive on-Site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-Site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles. [Alternate language: Water will be available on-site at suitable supply and pressure for use in dust control.]
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-Site roads will be limited in total area to minimize the area required for water spraying.

5.4.13.3 OTHER NUISANCES

The following text should be included somewhere in this section (these plans are generally not required for submission to NYSDEC):

A plan for rodent control will be developed and utilized by the contractor prior to and during Site clearing and Site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work and will conform, at a minimum, to NYCDEP noise control standards.

6.0 Residual Contamination to Remain On-site

This section should provide a thorough summary of all of the contamination that is expected to be left on-Site. Contact NYSDEC for input on appropriate comparison for Site soils (i.e. Part 375-6 SCOs)

The following text should be included somewhere in this section:

Since residual contaminated soil [and groundwater/soil vapor] will exist beneath the Site after the remedy is complete, Engineering and Institutional Controls (ECs and ICs) are required to protect human health and the environment. These ECs and ICs are described hereafter. Long-term management of EC/ICs and of residual contamination will be executed under a Site specific Site Management Plan (SMP) that will be developed and included in the FER.

ECs will be implemented to protect public health and the environment by appropriately managing residual contamination. The Controlled Property (the Site) will have [number] primary EC systems. These are: [list all, for instance: (1) a composite cover system consisting of asphalt covered roads, concrete covered sidewalks, and concrete building slabs].

The FER will report residual contamination on the Site in tabular and map form. This will include presentation of exceedances of both Track 1 and Track 4 sites.

7.0 Engineering Controls: Site Cover System

Exposure to residual contaminated soils will be prevented by an engineered site cover system that will be built on the Site. This site cover system will be comprised of asphalt covered roads, concrete covered sidewalks, and concrete building slabs [add/delete components].

Green remediation BMPs for designing and installing a conventional cover system include:

- Design in ways that mimic rather than alter the site's natural setting, to improve the cover's long-term performance and protect ecosystem services such as potable water, wildlife habitat, and carbon storage;
- Design a cover accounting for potential effects of climate change, which could involve changes in onsite soil development or increased vulnerability to flooding;
- Use uncontaminated soil or sediment from onsite excavation instead of imported soil/sediment for the cover's frost prevention and erosion control layers; similarly,

- uncontaminated sand, gravel, and rocks from onsite instead of offsite areas may be used for drainage;
- Apply low impact development strategies such as installing earthen berms to manage stormwater;
 - Choose geotextile fabric or drainage tubing composed of 100% recycled materials rather than virgin materials for lining, erosion control, and drainage;
 - Select materials with biobased content for daily activities during cover construction;
 - Use clean fuel and emission control technologies for routine field vehicles and machinery such as backhoes and bulldozers to reduce fuel consumption and emission of air pollutants such as GHGs and particulate matter; and
 - Investigate onsite solar and wind resources to power equipment such as leachate pumps and flare units.

For alternative cover designs

- Consider using asphalt rubber (containing recycled tires) where the cover system includes a layer of asphalt;
- Substitute concrete with high albedo pavement, which reflects sunlight and heat away from the cover surface and may aid growth of nearby vegetation; and
- Consider using concrete containing a high percentage of industrial waste by-products as a substitute for cement, if tests show no contaminant leaching.

In addition to BMPs that apply to conventional covers, BMPs for designing and installing an ET cover include:

- Choose recycled (crushed) concrete for biobarriers or capillary breaks instead of natural rock;
- Select native drought-resistant plants for the upper vegetative layer to reduce maintenance needs;
- Preserve biodiversity and related ecosystem services by installing a suitable mix of native shrubs, grasses, and forbs; and
- Use non-synthetic amendments such as compost instead of chemical fertilizers if the soil or vegetation is found to need supplementation over time.

Other approaches and/or considerations may be included with the approval of NYSDEC's Project Manager.

This section should describe the cover system and include the following topics:

- Conceptual remedial approach

- General cover design and installation plan
 - Components, materials and layout
 - Planned cover location
 - Maps and diagrams
 - Operating conditions
 - Processes and materials employed
- System OM&M requirements

The following text should be included somewhere in this section:

A diagram showing the design detail for each cover type is shown in Figure [x].

A map showing the aerial distribution of each of the cover types to be built at the Site is included in Figure [x].

An Excavation Plan will be included in the Site Management Plan and will outline the procedures to be followed if the site cover system and underlying residual contamination are disturbed after the Remedial Action is complete.

The components of the site cover system will be documented in the FER. Maintenance of this site cover system will be described in the SMP.

8.0 Engineering Controls: Treatment Systems

Incorporation of broad BMPs during project planning can help minimize the environmental footprint of a treatment system throughout its life. Relevant BMPs include:

- Integrate one or more onsite photovoltaic (PV) or wind energy systems to supply electricity for groundwater extraction and treatment equipment or for offsetting grid-supplied electricity used for this purpose. The systems may be scaled up or configured in a modular fashion to additionally meet electricity demands of ongoing site activities or anticipated site reuse.
- Identify onsite or offsite non-potable uses for the treated water, such as building operations, dust and fire suppression, plant irrigation, wetlands restoration or recreational impoundments.

- Choose the nearest facilities at which to dispose of or recycle anticipated wastes.
- Use existing structures that are unused or underutilized to house remediation and monitoring equipment and supplies.
- Incorporate green requirements into applicable service and product procurements.

Other BMPs can be incorporated into detailed design of a treatment system, such as:

- Maximize automation of mechanical and electronic equipment to minimize in-person monitoring.
- Implement a telemetry system to reduce frequency of site visits and responses to non-critical alarms.
- Use multi-port sampling systems rather than well clusters to collect groundwater samples from multiple depths, which minimizes the number of monitoring wells needing to be installed.
- Rely on gravity flow where feasible to minimize the number of pumps required for groundwater transfer or effluent discharge.
- Use closed-loop rather than open-loop treatment processes to reduce the need for fresh water and raw materials and potentially improve treatment system efficiency.
- Reclaim uncontaminated byproducts for potential recycling, such as precipitated metals, solids and spent activated carbon.

Lifecycles and environmental tradeoffs within and among treatment projects may vary considerably. Considerations might include aspects such as:

- The natural resources used to manufacture or process chemicals and other treatment materials.
- Fuel usage and air emissions associated with transporting goods or wastes and commuting workers.
- Coinciding increases in energy efficiency and energy demand associated with pre-heating extracted groundwater prior to treatment.
- The potential for treatment chemicals or treatment byproducts to exist in the treatment system effluent.

Other approaches and/or considerations may be included with the approval of NYSDEC's Project Manager.

This section should present a detailed description of the methods for implementation for each of the remaining Engineering Controls to be utilized both on-Site and off-Site. One Section should be dedicated to each Engineering Control to be implemented in the remedy (for instance, (8.1) sub-slab depressurization and vapor barrier; (8.2) air sparging/soil vapor extraction; (8.3) application of bio-treatment technology). Each section should include a description of:

- Conceptual remedial approach
- General system design and installation plan
 - Components, materials and layout
 - Planned system location
 - Maps
 - Operating conditions
 - Treatment systems to be installed
 - Processes and materials employed
- System OM&M requirements

If chemical oxidant/biological treatment is included in the Remedial Action, the following text should be included somewhere in this section:

Volume and density application rates for [chemical oxidant/biological nutrient] will be based on the manufacturer's recommendations. A letter from the manufacturer stating recommended dosage rates will be provided to NYSDEC and will be included in the Final Engineering Report.

[Chemical oxidant/biological nutrient] will be applied to the base of excavation areas to address potential recontamination from groundwater migration following completion of dewatering.

Design plans and a work schedule will be submitted to NYSDEC for injection and reinjection of [chemical oxidant/biological nutrient].

All as-built drawings, diagrams, calculation and manufacturer documentation for treatment systems will be presented in the FER.

9. Criteria for Completion of Remediation/Termination of Remedial Systems

9.1 COMPOSITE COVER SYSTEM

The following text should be included somewhere in this section:

The composite cover system is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

9.2 SUB-SLAB DEPRESSURIZATION SYSTEM (SSDS)

The following text should be included somewhere in this section:

The active SSD system will not be discontinued without written approval by NYSDEC and NYSDOH. A proposal to discontinue the active SSD system may be submitted by the property owner based on confirmatory data that justifies such request. Systems will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC and NYSDOH.

9.3 AIR SPARGING/SOIL VAPOR EXTRACTION SYSTEM [AS/SVE SYSTEM]

The AS/SVE system will not be discontinued without written approval by NYSDEC and NYSDOH. A proposal to discontinue the system may be submitted by the property owner after residual contamination concentrations in groundwater: (1) are cleaned up to levels below NYSDEC standards, (2) have become asymptotic over an extended period of time as mandated by the NYSDEC and the NYSDOH, or (3) if NYSDEC has determined that the AS/SVE system has reached the limit of its effectiveness. This assessment will be based in part on post-remediation contaminant levels in groundwater collected from monitoring wells located throughout the Site. Systems will remain in place and operational until permission to discontinue their use is granted in writing by NYSDEC and NYSDOH. These sampling/monitoring activities will adhere to stipulations outlined in the Monitoring Plan section of the SMP.

9.4 GROUNDWATER MONITORING

Groundwater monitoring activities to assess the performance of the remedy, or natural attenuation following the removal of contaminant sources, will continue, as determined by NYSDOH and NYSDEC, until residual groundwater concentrations are found to be below

NYSDEC standards or have become asymptotic over an extended period. Monitoring will continue until permission to discontinue is granted in writing by NYSDEC and NYSDOH. Monitoring activities will be outlined in the Monitoring Plan of the SMP. It is anticipated that, following remediation, a minimum of eight quarterly monitoring events will be performed.

9.5 TREATMENT SYSTEMS

(Describe long-term active treatment systems ISCO, SVE etc.)

10.0 Institutional Controls

The following section is not required if the project achieves Track 1. If a Track 1 remedy is pursued, it is strongly advised that a separate plan be developed for a Track 4 remedy to be implemented as a contingency in case Track 1 cannot be achieved. This section should be included as part of that contingency plan.

After the remedy is complete, the Site will have residual contamination remaining in place. Engineering Controls (ECs) for the residual contamination have been incorporated into the remedy to render the overall Site remedy protective of public health and the environment. Two elements have been designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and a Site Management Plan (SMP).

All as-built drawings, diagrams, calculation and manufacturer documentation for treatment systems will be presented in the FER. A Site -specific Environmental Easement will be recorded with [County Name] County [for sites in New York City use NYC Office of the City Register] to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. It requires that the grantor of the Environmental Easement and the grantor's successors and assigns adhere to all Engineering and Institutional Controls (ECs/ICs) placed on this Site by this NYSDEC-approved remedy. ICs provide restrictions on Site usage and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. The SMP describes appropriate methods and procedures to ensure compliance with all ECs and ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

10.1 Environmental Easement

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left on-Site after the Remedial Action is complete. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the [county] County Office of the City Register. The Environmental Easement will be submitted as part of the Final Engineering Report.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with [county] County [for New York City sites use NYC Office of the City Register] before the Certificate of Completion can be issued by NYSDEC. A series of Institutional Controls are required under this remedy to implement, maintain and monitor these Engineering Control systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to [usage type] use(s) only. These Institutional Controls are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. Institutional Controls can, generally, be subdivided between controls that support Engineering Controls, and those that place general restrictions on Site usage or other requirements. Institutional Controls in both of these groups are closely integrated with the SMP, which provides all of the methods and procedures to be followed to comply with this remedy.

The Institutional Controls that support Engineering Controls are:

Select controls that apply to the Site or that are needed to support the remedy. Institutional Controls may be modified, added or deleted from this list as warranted by Site conditions. NYSDEC may also revise this list during review of the FER and SMP. Compliance with all elements of the Site Management Plan is required by the Grantor of the Environmental Easement, and the Grantor's successors and assigns.

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- A site cover system consisting of asphalt covered roads, concrete covered sidewalks, and concrete building slabs must be inspected, certified and maintained as required in the SMP;

- A [soil vapor mitigation] system consisting of [a sub-slab depressurization system under all building structures] must be inspected, certified, operated and maintained as required by the SMP;
 - All Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP;
- (Note: one bullet should be directed to each Engineering Control system);
- [Groundwater, soil vapor,] and other environmental or public health monitoring must be performed as defined in the SMP;
 - Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;
 - On-Site environmental monitoring devices, including but not limited to, [groundwater monitor wells and soil vapor probes], must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP;
 - Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement.

Note: Institutional Controls may be modified, added or deleted from this list as warranted by Site conditions and deemed necessary by NYSDEC.

Adherence to these Institutional Controls for the Site is mandated by the Environmental Easement and will be implemented under the SMP (discussed in the next section). The Controlled Property (Site) will also have a series of Institutional Controls in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Vegetable gardens and farming on the Controlled Property are prohibited;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;
- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the SMP;

- The Controlled Property may be used for [usage type: e.g. restricted commercial] use only, provided the long-term Engineering and Institutional Controls included in the SMP are employed;
- The Controlled Property may not be used for a higher level of use, such as [restricted residential] use without an amendment or extinguishment of this Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This [time period] statement must be certified by an expert that the NYSDEC finds acceptable.

Note: Add other ICs as appropriate.

10.2 Site Management Plan

Site Management is the last phase of remediation and begins with the approval of the FER and issuance of the Certificate of Completion (COC) for the Remedial Action. The SMP is submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the SMP are performed.

The SMP should include methods to incorporate and track GSR. Measures should be taken to maintain a cost-effective, protective remedy that remains conscientious of the Site's environmental footprint. At a minimum, the following should be assessed: waste generation, energy usage, emissions, and water usage.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (5) defining criteria for termination of treatment system operation.

To address these needs, this SMP will include four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will be [annually]. The SMP will be based on the certifying period relative to the date of issuance of the COC. The first submission will be due 16 months after the issuance of the COC, and annually (or at another frequency as approved by NYSDEC) thereafter.

The following text should be included somewhere in this section:

The SMP in the FER will include a monitoring plan for groundwater at the down-gradient Site perimeter to evaluate Site-wide performance of the remedy. [Appropriately placed groundwater monitor wells will also be installed immediately down-gradient of all source remediation areas for the purpose of evaluation of the effectiveness of the remedy that is implemented.]

No exclusions for handling of residual contaminated soils will be provided in the SMP. All handling of residual contaminated material will be subject to provisions contained in the SMP.

Note: See template for the SMP for details on required content.

11.0 Final Engineering Report

A Final Engineering Report (FER) will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of all sources. The Final Engineering Report will include as-built drawings for all constructed elements, calculation and manufacturer documentation for treatment systems, certifications, manifests, bills of lading as well as the complete SMP. The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling, and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. The FER will be prepared in conformance with DER-10.

The following text should be included somewhere in this Section:

Where determined to be necessary by NYSDEC, a Financial Assurance Plan will be required to ensure the sufficiency of revenue to perform long-term operations, maintenance and monitoring tasks defined in the Site Management Plan and Environmental Easement. This determination will be made by NYSDEC in the context of the FER review.

The FER will include written and photographic documentation of all remedial work performed under this remedy.

The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 1 Unrestricted Use SCO in 6NYCRR Part 375-6. A table that shows exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

The FER will include an accounting of the destination of all material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

The FER must include a discussion of the green remediation practices/technologies employed throughout the remedial program. A final footprint analysis using a DER accepted model, and any tracking methods used through the construction including restoration activities. Before approval of a FER and issuance of a COC, all project reports must be submitted in digital form on electronic media (PDF).

For projects with approved documents, such as a Remedial Investigation Work Plan and/or a Remedial Investigation Report, which were not originally submitted in digital format, the approved versions of such documents must be submitted in digital format to the NYSDEC project manager before FER approval will be provided.

Note: See template for the FER for details on required content.

11.1 Certifications

The following certification will appear in front of the Executive Summary of the Final Engineering Report. The FER will be prepared, stamped and the following certification signed by an individual licensed or otherwise authorized in accordance with article 145 of the education law to practice the profession of engineering. The certification will include the following statements:

I, [REDACTED], am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the [Remedial Action Work Plan or Remedial Design] was implemented and that all construction activities were completed in substantial conformance with the Department-approved [Remedial Action Work Plan or Remedial Design].

If the RAWP or RD identifies time frames to be achieved by the remedial program:

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the [Remedial Action Work Plan or Remedial Design] and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established for the remedy.

I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

If financial assurance is required:

I certify that any financial assurance mechanisms required by the Department pursuant to Environmental Conservation Law have been executed.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as Owner's Designated Site Representative (and if the site consists of multiple properties): [and I have been authorized and designated by all site owners to sign this certification] for the site.

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

12.0 Schedule

A schedule of Remedial Actions is mandatory. It must subdivide work elements and provide estimated dates for performance of work and deliverables. The schedule should also be projected outward to capture the anticipated timing of submission for the final engineering report, site management plan and environmental easement package, if applicable, and the date of the planned receipt of a certificate of completion.