

Site Management Plan Template

Instructions to NYSDEC Project Manager

The NYSDEC Project Manager may delete or indicate as “Not Applicable” sections of this template that do not apply to a specific site before sending it to the Remedial Party. Alternatively, non-applicable sections may be identified in scoping discussions.

Instructions to Remedial Party / Remedial Party Consultant

This document is a template for development of a Site Management Plan (SMP) for remedial projects performed under the management of NYSDEC, Division of Environmental Remediation. This document is intended to expedite development of a site-specific SMP. By providing format and general content guidelines, this template is designed to provide instruction on the format and content required for agency approval; shorten the document preparation time by remedial parties; improve the quality of draft SMP submittals; shorten the review time by NYSDEC; and streamline the process for SMP approval by NYSDEC. This is a generic and non-site-specific document that does not address all possible health or environmental issues of concern to NYSDEC or NYSDOH. It is provided as a supplement to NYSDEC’s DER-10 and DER-31 and is not a substitute for the agency review and comment process.

For many sites, portions of the text or entire sections of this template may not be applicable and should be deleted or indicated as “Not Applicable”. Remedial parties should use their best judgment in determining which components of this template are relevant to the site. Many of the sections require that summaries of information from previous documents (e.g., investigation reports, final engineering reports, etc.) be incorporated. The purpose of summarizing this information in this document is to provide a single, concise resource for future owners or site workers to understand the remedial history and nature of site contamination. The emphasis should be on the contamination that remains. The reader should be able to clearly understand the site’s remedial history and nature and extent of the contamination remaining in the various environmental media (and perhaps building materials), as well as the corresponding potential human exposure pathways, that are being addressed by the SMP.

This template may also be used to develop an Interim Site Management Plan, through which an interim remedial measure or operable unit is monitored, operated and/or maintained before the remedy for the entire site is complete. In this case, the document should be titled and introduced as an interim plan.

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.

The following template is a working document and may be modified and improved periodically. Comments and suggestions for improvement are welcome. It is recommended that the remedial party contact the NYSDEC's project manager prior to initiating the preparation of the SMP to ensure the use of the most recent version of this template.

[Site Name]
[County Name] COUNTY
[City], NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: [xxxxxxx]
USEPA ID # [Enter if applicable]

Prepared for:

[Remedial Party Name]
[Remedial Party Address]

Prepared by:

[Name]
[Address]
[Phone]

Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

[MONTH YEAR]

CERTIFICATION STATEMENT

I _____ certify that I am currently a [NYS registered professional engineer or Qualified Environmental Professional as in defined in 6 NYCRR Part 375] and that this Site Management 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).

_____ [P.E., QEP]

_____ DATE

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[Site Name]
[County Name] COUNTY
[City], NEW YORK

SITE MANAGEMENT PLAN

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

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List of Acronyms

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
DUSR	Data Usability Summary Report
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Greenhouse Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
P.E. or PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study

ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization
SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

The table below should reflect the site-specific items listed in Sections 3, 4 and 5. The green text below are examples and should be changed to reflect site specific requirements.

Site Identification: [Site Identification No.] [Site Name and Address]

Institutional Controls:	1. The property may be used for [restricted residential; commercial, etc.] use;
	2. All ICs as listed in Section 3.2 should be listed here.
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP. This statement is to be included here if there are ECs per the site's remedial program.
Engineering Controls:	1. Cover system
	2. All ECs as listed in Section 3.3 should be restated here.
Inspections:	Frequency
1. Cover inspection	Annually
Monitoring:	
1. Extraction Well No. 1	Monthly
2. Groundwater Monitoring Wells MW-1, MW-2 and MW-3	Quarterly
2. Soil Vapor Intrusion Evaluation for New Buildings	As needed
Maintenance:	
1. Swale maintenance	As needed
2. Blower maintenance	Quarterly
Reporting:	
1. Groundwater and Treatment System Data	Monthly

Site Identification: [Site Identification No.] [Site Name and Address]

2. Periodic Review Report	Annually
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Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the [Site] located in [City], New York (hereinafter referred to as the “Site”). See Figure [x]. The Site is currently in the New York State (NYS) [Select one: Brownfield Cleanup Program (BCP), Environmental Restoration Program (ERP), Inactive Hazardous Waste Disposal Site Remedial Program, Voluntary Cleanup Program (VCP)], Site No. [xxxxxx], which is administered by New York State Department of Environmental Conservation (NYSDEC or Department).

[Remedial Party name(s)] entered into a [Brownfield Cleanup Agreement (BCA), State Assistance Contract (SAC), Order on Consent, Voluntary Cleanup Agreement (VCA)] on [date] with the NYSDEC to remediate the site. A figure showing the site location and boundaries of this site is provided in Figure [X]. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in Appendix [X].

Note: The Environmental Easement may not be available when the SMP is drafted. If the metes and bounds are available when the SMP is prepared, this should be included as an appendix and referenced. If the institutional control for the site is a restrictive covenant or environmental notice rather than an easement, change all references from “environmental easement” to “deed restriction” or “environmental notice” in this document. Also, if the area requiring site management is different than the metes and bounds description provided in the easement, a figure showing the site boundary within which site management is required must be provided in this section of the SMP.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as “remaining contamination”. [Institutional and Engineering Controls (ICs and ECs)] have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the [county] County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site.

This SMP was prepared to manage remaining contamination at the site [add “and off-site” if applicable] until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor’s successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC); and
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6 NYCRR Part 375 and the [BCA, SAC, Order on Consent, VCA] (Index #xx-xxxx-xx-xx; Site #xxxxxxx) for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in Appendix [x] of this SMP.

This SMP was prepared by [Environmental Consultant name], on behalf of [Remedial Party name(s)], in accordance with the requirements of the NYSDEC’s DER-10 (“Technical Guidance for Site Investigation and Remediation”), dated [month, year], and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the site.

1.2 Revisions and Alterations

Revisions and alterations to this plan will be proposed in writing to the NYSDEC’s project manager. The NYSDEC can also make changes to the SMP or request revisions

from the remedial party. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shutdown of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. All approved alterations must conform with Article 145 Section 7209 of the Education Law regarding the application of professional seals and alterations. For example, any changes to as-built drawings must be stamped by a New York State Professional Engineer. In accordance with the Environmental Easement for the site, the NYSDEC project manager will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

1. 60-day advance notice of any proposed changes in site use that are required under the terms of the [Select one: BCA, SAC, Order on Consent, VCA], 6 NYCRR Part 375 and/or Environmental Conservation Law.
2. 7-day advance notice of any field activity associated with the remedial program.
3. 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan. If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above mentioned 60-day advance notice is also required.
4. Notice within 48 hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
5. Notice within 48 hours of any non-routine maintenance activities.
6. Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
7. Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days

describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

8. At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the [Select one: Brownfield Cleanup Agreement (BCA), State Assistance Contract (SAC), Order on Consent, Voluntary Cleanup Agreement (VCA)], and all approved work plans and reports, including this SMP.
9. Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table [x] on the following page includes contact information for the above notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix [x].

Table [x]: Notifications*

<u>Name</u>	<u>Contact Information</u>	<u>Required Notification**</u>
[NYSDEC Project Manager]	[phone] [email address]	All Notifications
[NYSDEC Project Manager’s Supervisor]	[phone] [email address]	All Notifications
[NYSDEC Site Control]	[phone] [email address]	Notifications 1 and 8
[NYSDOH Project Manager]	[phone] [email address]	Notifications 4, 6, and 7

* Note: Notifications are subject to change and will be updated as necessary.

** Note: Numbers in this column reference the numbered bullets in the notification list in this section.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

This section should provide a concise description of the location and layout of the site, all areas of remaining contamination, remedial activities performed on-site, site history, and the nature and extent of contamination before and after the remedy. The description should be sufficient for someone not familiar with the project to implement this SMP. Anticipate that this may be the only document available in the future to someone who may be conducting work at the site.

2.1 Site Location and Description

The site is located in [City], [County Name] County, New York and is identified as Section [xxxx] Block [xxxx] and Lot [xxx] on the [Municipality or County Name] Tax Map (see Figure [x]). The site is an approximately [x]-acre area and is 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] – Site Layout Map). Figure is to include site boundary and tax parcels. The boundaries of the site are more fully described in Appendix [x] – Environmental Easement. The owner(s) of the site parcel(s) at the time of issuance of this SMP is/are:

[Site owner(s)]

Add if applicable:

The operator(s) of the site parcel(s) at the time of issuance of this SMP is/are:

[Site operator(s)]

Note: The Environmental Easement may not be available when the SMP is drafted. If the metes and bounds are available when the SMP is prepared, this should be included as an appendix and referenced. If the institutional control for the site is a restrictive covenant or environmental notice rather than an easement, change all references from “environmental

easement” to “deed restriction” or “environmental notice” in this document. Also, if the area requiring site management is different than the metes and bounds description provided in the easement, a figure showing the site boundary must be provided in Appendix [X] – Environmental Easement.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: a [building, parking area etc.]. The Site is zoned [commercial, industrial etc.] and is currently [vacant, utilized for commercial uses, etc.]. Site occupants include [dry cleaner, etc.]. Other site attributes pertinent to the land use should be added.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include [commercial, residential, etc.] properties. The properties immediately south of the Site include [commercial, residential, etc.] properties; the properties immediately north of the Site include [commercial, residential, etc.] properties; the properties immediately east of the Site include [commercial, residential, etc.] properties; and the properties to the west of the Site include [commercial, residential, etc.] properties.

2.2.2 Geology

This section should **briefly** describe:

- Lithology (including historic fill) with thicknesses:
 - geologic cross section(s) (Figure);

A geologic cross section is shown in Figure [x]. Site specific boring logs are provided in Appendix [x].

2.2.3 Hydrogeology

This section should **briefly** describe:

- depth to groundwater;
- groundwater flow directions: site, local and regional;
- local and regional hydraulic conductivity;
- include groundwater flow figure(s) with data; and
- presence of private wells, if applicable, and locations of public water supply wells.

The following text should be included in this section:

A groundwater contour map is shown in Figure [x]. Groundwater elevation data is provided in Table [x]. Groundwater monitoring well construction logs are provided in Appendix [x].

2.3 Investigation and Remedial History

This section should include a concise description of all investigation and remedial activities performed for the site. The descriptions should be provided in chronological order and provide a brief summary of the findings of each project record. This section should be short and concise, but comprehensive. This section should also:

- Briefly describe past uses and ownership;
- Reference historical reports (remedial investigation, feasibility study, etc.); and
- Describe former structures, processes and activities.

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 – References.

List all investigation and remedial reports prepared, with specific titles and dates. Include reports for off-site findings as applicable. This section should describe the original site conditions prior to implementation of the remedy and describe the conceptual model of on-site and off-site contamination, and any areas of concern requiring remediation. This should be a broad overview of pre-remedial contamination at the site, similar to the level of detail in the Record of Decision (ROD) or Decision Document. This should answer the question, “why was remediation performed?”.

Known or suspected sources of contamination (e.g. underground storage tanks, disposal areas, dry wells, etc.) should be identified on figures. Contaminant classes and major

compounds or elements identified in each of the media of concern (e.g. soil, groundwater, soil vapor, indoor air, surface water and sediment) should be provided. Ranges of contaminant concentrations for primary contaminants and comparison should be included in applicable table(s) or figure(s), as warranted.

2.4 Remedial Action Objectives

This section should provide the listing of the Remedial Action Objectives (RAOs) from the Record of Decision or Decision Document for the Site. Generic RAOs are listed below for reference purposes. Non-applicable RAOs should be deleted and revised to be consistent with the Record of Decision or Decision Document for the site and site-specific RAOs should be added as necessary.

The Remedial Action Objectives (RAOs) for the Site as listed in the [Record of Decision or Decision Document] dated [month, day, year] are as follows:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

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

Surface Water

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore surface water to ambient water quality criteria for the contaminant of concern.
- Prevent impacts to biota from ingestion/direct contact with surface water causing toxicity and impacts from bioaccumulation through the marine or aquatic food chain.

Sediment

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

2.5 Remaining Contamination

This section should provide a sufficient summary of contamination remaining at the site so that anyone performing future excavations or development at the site can anticipate the environmental conditions they will encounter. Non-applicable sub-sections should be removed from this section. This section should be updated with the current description of remaining contamination, including contaminant concentrations, when the SMP is revised.

2.5.1 Soil

This section should describe the existing soil conditions, both on-site and off-site, at the time of issuance of the FER.

This section should include the following:

- A description of the contaminant classes and major compounds or elements identified in the soil;
- A table of exceedances of applicable/relevant Unrestricted Use SCOs (Part 375-6) after completion of the remedial action;
- A figure of exceedances of applicable/relevant Unrestricted Use SCOs (Part 375-6) after implementation of the remedial action. This figure should also identify areas complying with Unrestricted Use SCOs (Part 375-6) after completion of the remedial action;
- A figure showing the elevations of the top of remaining soil contamination and the thickness of the remaining contamination;
- A description of the estimated volume of remaining soil contamination;

- A description of the demarcation layer (if present, including material, depth, extent, etc.) or a description of the depth at which remaining contamination will be encountered, and the depth at which contamination is no longer expected;
- A description of areas of the site that contain remaining source areas or higher levels of contamination;
- A description of active utility lines or other subsurface infrastructure present at the site and remaining contamination that may be encountered during maintenance or removal of the utility or infrastructure;
- A description of remaining contamination that was not remediated due to the presence of buildings or critical infrastructure; and
- Information necessary to support any soil sampling required as part of the Monitoring and Sampling Plan (Section 4.0 of this SMP).

The following text should be included in this section:

Table [x] and Figure [x] summarize the results of all soil samples collected that exceed the Unrestricted Use SCOs and the [residential, restricted residential, commercial or industrial] Use SCOs at the site after completion of remedial action.

2.5.2 Sediment

This section should describe the existing sediment conditions, both on-site and off-site, after completion of the remedy. This section should include the following:

- A description of the contaminant classes and major compounds or elements identified in the sediment;
- A table of exceedances of applicable/relevant standards, criteria and guidelines (SCGs) after completion of the remedial action;
- A figure of exceedances of applicable/relevant SCGs after completion of the remedial action;
- A figure showing the elevations of the top of remaining sediment contamination and the thickness of the remaining contamination;
- A description of the estimated volume of remaining sediment contamination;
- A description of the demarcation layer (if present, including material, depth, extent, etc.) or a description of the depth at which remaining contamination will be encountered, and at which contamination is no longer expected;
- A description of areas of the site that contain remaining source areas or higher levels of contamination; and
- Information necessary to support any sediment sampling required as part of the Monitoring and Sampling Plan (Section 4.0 of this SMP).

The following text should be included in this section:

Table [x] and Figure [x] summarize the results of all sediment samples collected that exceed the SCGs after completion of the remedial action.

2.5.3 Groundwater

This section should describe the existing groundwater conditions, both on-site and off-site, after completion of the remedy.

This section should include the following:

- A description of the contaminant classes and major compounds or elements identified in the groundwater;
- Table of exceedances of applicable/relevant SCGs after completion of the remedial action;
- Figure of exceedances of applicable/relevant SCGs after completion of the remedial action;
- Figure of plume;
- A description of the depths, range and aerial location of the remaining groundwater contamination at the site including contaminants of concern and levels above SCGs for the site;
- A description of areas of the site that contain remaining source areas or higher levels of contamination; and
- Information necessary to support any groundwater sampling required as part of the Monitoring and Sampling Plan (Section 4.0 of this SMP).

The following text should be included in this section:

Table [x] and Figure [x] summarize the results of all samples of groundwater that exceed the SCGs after completion of the remedial action.

2.5.4 Surface Water

This section should describe the existing surface water conditions, both on-site and off-site, after completion of the remedy.

This section should include the following:

- A description of the contaminant classes and major compounds or elements identified in the surface water;
- Table of exceedances of applicable/relevant SCGs after completion of the remedial action;

- Figure of exceedances of applicable/relevant SCGs after completion of the remedial action;
- A description of the depths, range and aerial location of the remaining surface water contamination at the site including contaminants of concern and levels above SCGs for the site;
- A description of areas of the site that contain remaining source areas or higher levels of contamination; and
- Information necessary to support any surface water sampling required as part of the Monitoring and Sampling Plan (Section 4.0 of this SMP).

The following text should be included in this section:

Table [x] and Figure [x] summarize the results of all samples of surface water that exceed the SCGs after completion of the remedial action.

2.5.5 Soil Vapor

This section should describe the existing soil vapor exceedances and concerns regarding the potential for soil vapor intrusion conditions, both on-site and off-site, after completion of the remedy.

This section should include the following:

- 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.
- A description of areas of the site that contain higher levels of contamination;
- Table of exceedances of applicable/relevant SCGs after completion of the remedial action;
- Figure of exceedances of applicable/relevant SCGs after completion of the remedial action; and
- Information necessary to support any soil vapor sampling required as part of the Monitoring and Sampling Plan (Section 4.0 of this SMP).

The following text should be included in this section:

Table [x] and Figure [x] summarize the results of all samples of soil vapor that exceed the SCGs after completion of the remedial action.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

If a site does not require engineering controls all references to engineering controls can be removed from this section.

3.1 General

Since remaining contamination exists at the site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC project manager.

This plan provides:

- A description of all IC/ECs on the site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the Excavation Work Plan (EWP) (as provided in Appendix [x]) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC project manager.

3.2 Institutional Controls

A series of ICs is required by the [ROD, RAWP or Decision Document] to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the site to

[usage type] uses only. Adherence to these ICs on the site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figure [x]. These ICs are:

List all ICs; use the following text as appropriate; this list should match the remedy for the site and the Environmental Easement. For example, if the remedy requires demolition of an on-site building if it becomes unsafe, inactive or vacant, add that provision to the list below.

- The property may be used for: [residential, restricted residential; commercial, industrial] use;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the [county name] Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;

- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on Figure [x], and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the site are prohibited; and
- An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

3.3 Engineering Controls

Note that a HASP and CAMP are required for all sites with ECs.

3.3.1 Cover (or Cap) (if applicable)

Exposure to remaining contamination at the site is prevented by a cover system placed over the site. This cover system is comprised of a minimum of [12 inches, 24 inches, etc.] of [clean soil, asphalt pavement, concrete-covered sidewalks, and concrete building slabs, add other components as appropriate]. Figure [x] presents the location of the cover system and applicable demarcation layers. The Excavation Work Plan (EWP) provided in Appendix [x] outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in Appendix [x]. Any breach of the site's cover system must be overseen by a Professional Engineer (PE) who is licensed and registered in New York State or a qualified person who directly reports to a PE who is licensed and registered in New York State.

3.3.2 [Other ECs: e.g. Groundwater Extraction and Treatment, Sub-slab Depressurization Systems; Air Sparging/Soil Vapor Extraction Systems; etc.]

Each additional section should include a description, including figures as appropriate, of the system, objective, design and operation, including:

- General introduction for remedial system;
- Remedial objective;
- System start date;
- Location of system;
- System design information;
- Components, materials and layout;
- Operating conditions; and
- Existing system permits or equivalencies (Appendix [x]).

The following text should be included within each treatment system section:

Procedures for operating and maintaining the [remedial system name] system are documented in the Operation and Maintenance Plan (Section 5.0 of this SMP). As-built drawings, signed and sealed by a PE who is licensed and registered in New York State, are included in Appendix [X] – Operations and Maintenance Manual. Figure [x] shows the location of the ECs for the site.

3.3.3 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10. Unless waived by the NYSDEC, confirmation samples of applicable environmental media are required before terminating any remedial actions at the site. Confirmation samples require Category B deliverables and a Data Usability Summary Report (DUSR).

As discussed below, the NYSDEC may approve termination of a groundwater monitoring program. When a remedial party receives this approval, the remedial party will decommission all site-related monitoring, injection and recovery wells as per the NYSDEC CP-43 policy.

The remedial party will also conduct any needed site restoration activities, such as asphalt patching and decommissioning treatment system equipment. In addition, the

remedial party will conduct any necessary restoration of vegetation coverage, trees and wetlands, and will comply with NYSDEC and United States Army Corps of Engineers regulations and guidance. Also, the remedial party will ensure that no ongoing erosion is occurring on the site.

3.3.3.1 – Cover (or Cap)

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

[3.3.3.x – Sub-Slab Depressurization (SSD) System]

The following text should be included within this section:

The SSD system will not be discontinued unless prior written approval is granted by the NYSDEC and the NYSDOH project managers. If monitoring data indicates that the SSD system may no longer be required, a proposal to discontinue the SSD system will be submitted by the remedial party to the NYSDEC and NYSDOH project managers.

[3.3.3.x – Air Sparging/Soil Vapor Extraction System (AS/SVE) System]

The AS/SVE system will not be discontinued unless prior written approval is granted by the NYSDEC project manager. In the event that monitoring data indicates that the AS/SVE system may no longer be required, a proposal to discontinue the system will be submitted by the remedial party to the NYSDEC project manager. Conditions that may warrant discontinuing the AS/SVE system include contaminant concentrations in groundwater and/or soil that: (1) reach levels that are consistently below ambient water quality standards or the site SCGs, as appropriate; (2) have become asymptotic to a low level over an extended period of time, as accepted by the NYSDEC; or (3) the 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 the NYSDEC project manager.

[3.3.3.x – Groundwater Extraction and Treatment System (GWE&T) System]

The GWE&T system will not be discontinued unless prior written approval is granted by the NYSDEC project manager. In the event that monitoring data indicates that the GWE&T system may no longer be required, a proposal to discontinue the system, including the results of an impact study, will be submitted by the remedial party. Conditions that may warrant discontinuing the GWE&T system include contaminant concentrations in groundwater that: (1) reach levels that are consistently below ambient water quality standards or the site SCGs as appropriate, (2) have become asymptotic to a low level over an extended period of time as accepted by the NYSDEC; or (3) the NYSDEC has determined that the GWE&T 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 the NYSDEC project manager.

[3.3.3.x - Monitoring Wells associated with Monitored Natural Attenuation]

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC project manager in consultation with NYSDOH project manager, until residual groundwater concentrations are found to be consistently below ambient water quality standards, the site SCGs, or have become asymptotic at an acceptable level over an extended period. In the event that monitoring data indicates that monitoring for natural attenuation may no longer be required, a proposal to discontinue the monitoring will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC project manager. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

For in-situ remedies such as in-situ chemical oxidation, in-situ chemical reduction and bioremediation, include the section below. Fill in the site-specific in-situ technology where prompted.

[3.3.3.x - Monitoring Wells associated with [In-Situ Technology]]

Groundwater monitoring activities to assess [in-situ technology] will continue, as determined by the NYSDEC project manager in consultation with NYSDOH project manager, until residual groundwater concentrations are found to be consistently below ambient water quality standards or the site SCGs, or have become asymptotic at an acceptable level over an extended period. If monitoring data indicates that monitoring may no longer be required, a proposal to discontinue the remedy will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC project manager. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional injections, source removal, treatment and/or control measures will be evaluated.

4.0 MONITORING AND SAMPLING PLAN

Note: If monitoring or sampling is not required for the site this section can be removed.

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC project manager. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the site are included in the Quality Assurance Project Plan provided in Appendix [x].

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and

- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site – wide Inspection

Site-wide inspections will be performed [monthly, quarterly, etc.] or at a minimum of once per year. These periodic inspections must be conducted when the ground surface is visible (i.e. no snow cover). Site-wide inspections will be performed by a [qualified environmental professional as defined in 6 NYCRR Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State (depending on the need to evaluate engineering controls)]. Modification to the frequency or duration of the inspections will require approval from the NYSDEC project manager. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix [x] – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- Whether stormwater management systems, such as basins and outfalls, are working as designed;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the

SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC project manager must be given by noon of the following day. In addition, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as defined in 6 NYCCR Part 375. Written confirmation must be provided to the NYSDEC project manager within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public. The remedial party will submit follow-up status reports to the NYSDEC within 45 days of the event on actions taken to respond to any emergency event requiring ongoing responsive action, describing and documenting actions taken to restore the effectiveness of the ECs.

4.3 Treatment System Monitoring and Sampling

This Section should be included if there are active ECs

4.3.1 Remedial System Monitoring

The following text should be included for each EC, as appropriate:

Monitoring of the [specify type] will be performed on a routine basis, as identified in Table [XI] Remedial System Monitoring Requirements and Schedule (see below). The monitoring of remedial systems must be conducted by a [qualified environmental professional as defined in 6 NYCRR Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State (depending on the need to evaluate engineering controls)]. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager. A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the [specify EC] system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. [Specify EC] system components to be monitored include, but are not limited to, the components included in Table [XI] below.

Table [XI] – Remedial System Monitoring Requirements and Schedule

Remedial Component	System	Monitoring Parameter	Operating Range	Monitoring Schedule
Extraction Pump	Well	Flow Rate	5 – 10 GPM	Weekly

Examples of system components to be monitored for different remedial systems include:

- SSD systems (passive and active):
 - Vacuum blower;
 - Building slab; and
 - General system piping.
- AS/SVE systems:
 - Compressor;
 - Vacuum blower;
 - Individual well head; and
 - Effluent.
- Groundwater Extraction and Treatment Systems
 - Extraction wells;
 - Treatment components (i.e. air stripper, activated carbon, etc.)
 - Transfer pumps;
 - Pressure blower; and
 - General system piping.

Units for each monitoring parameter should also be included in the table. Include the following text for each remedial system, where applicable:

A complete list of components to be inspected is provided in the Inspection Checklist, provided in Appendix [x] – Site Management Forms. If any equipment readings are not within their specified operation range, any equipment is observed to be malfunctioning or the system is not performing within specifications; maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

4.3.2 Remedial System Sampling

This section should include a description of the sampling required for each component of the remedial system. The following text should be included in this section.

Samples shall be collected from the [specify type] on a routine basis. Sampling locations, required analytical parameters and schedule are provided in Table [X2] – Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

Table [X2] – Remedial System Sampling Requirements and Schedule

Sampling Location	Analytical Parameters				Schedule
	VOCs (EPA Method 624)	TAL Metals (EPA Method 6010B)	pH (EPA Method 9040)	VOC (EPA Method TO-15)	
Extraction Well #1	X	X	X		Quarterly
Air Stripper Vapor-Phase Effluent				X	Monthly

Detailed sample collection and analytical procedures and protocols are provided in Appendix [X] – Field Activities Plan and Appendix [X] – Quality Assurance Project Plan.

This section should also include a brief description of sample collection methods, sampling equipment and waste management, with specific reference to applicable Appendices for further detail.

The remedial party will properly dispose of all wastes generated by the remedial system at off-site disposal facilities according to local, state and federal laws and regulations. Wastes will be tested before disposal to comply with the permit conditions of the disposal facility. Wastes generated at this site include: [list wastes (ex. spent activated carbon)]. Describe how these wastes will be tested, handled, and transported, and where they will be disposed.

4.4 Post-Remediation Media Monitoring and Sampling

This section should include a description of the sampling required after completion of the remedy for the Site. The following text should be included in this section.

Samples shall be collected from the [specify type] on a routine basis. Sampling locations, required analytical parameters and schedule are provided in Table [X] – Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

Table [X] – Post Remediation Sampling Requirements and Schedule

Sampling Location	Analytical Parameters				Schedule
	VOCs (EPA Method 624)	TAL Metals (EPA Method 6010B)	pH (EPA Method 9040)	VOC (EPA Method TO-15)	
Monitoring Well #1	X	X	X		Quarterly
Subsurface Soil				X	2 weeks after shutdown of SVE

Location SB-1					
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Detailed sample collection and analytical procedures and protocols are provided in Appendix [x] – Field Activities Plan and Appendix [x] – Quality Assurance Project Plan.

This section should also include a brief description of sample collection methods, sampling equipment and waste management, with specific reference to applicable Appendices for further detail.

Below is text for the typical types of media to be monitored. Include sections for any additional media (i.e., biota, wetland habitat, etc.) required to be monitored under the site remedy.

4.4.1 Soil Sampling

Soil sampling will be performed [indicate frequency of required sampling] to assess the quality of the soil following completion of the remedial actions. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

The network of on-site [and off-site] soil sample locations has been designed based on the following criteria:

This section should include a discussion of soil sample location criteria.

- Provide a figure showing the soil sample locations;
- Discuss the depths of the soil samples (include cross-section, as appropriate); and
- Include a table of sample locations and analytical parameters to be analyzed along with the detection limits and minimum reporting limits to be achieved by the Environmental Laboratory Approval Program (ELAP) certified laboratory.

The following text should be included in this section:

The sampling frequency may only be modified with the approval of the NYSDEC project manager. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC project manager.

Deliverables for the soil sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.2 Sediment Sampling

Sediment sampling will be performed [indicate frequency of required sampling] to assess the quality of the sediment following completion of the remedial actions. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

The network of on-site [and off-site] sediment sample locations has been designed based on the following criteria:

This section should include a discussion of sediment sample location criteria.

- Provide a figure showing the sediment sample locations;
- Discuss the depths of the sediment samples (include cross-section, as appropriate); and
- Include a table of sample locations and analytical parameters to be analyzed along with the detection limits and minimum reporting limits to be achieved by the ELAP-certified laboratory;

The following text should be included in this section:

The sampling frequency may only be modified with the approval of the NYSDEC project manager. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC project manager.

Deliverables for the sediment sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.3 Groundwater Sampling

Groundwater monitoring will be performed [indicate frequency of required sampling] to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

Note: if Monitored Natural Attenuation is a remedial component, specific detail of the methods used is necessary and should be included in this section. See the NYSDEC's DER-10 for more details.

The network of monitoring wells has been installed to monitor upgradient, on-site and downgradient groundwater conditions at the site. The network of on-site [and off-site] wells has been designed based on the following criteria:

This section should provide a brief description of the wells that are sampled as part of the performance monitoring for the remedy.

The monitoring well network includes [number] sentinel wells that monitor downgradient plume migration. Sentinel wells are uncontaminated wells located directly downgradient of the plume and upgradient of sensitive receptors. The monitoring well network for this site includes the following sentinel wells: [list the sentinel wells].

Explain the rationale for selecting the sentinel well[s]. The sentinel well[s] should be located no closer than three years travel time of groundwater to the nearest potential downgradient receptor and no further than five years travel time from the delineated downgradient extent of the contaminant plume. Discuss measures that will be taken if one or more sentinel wells become contaminated.

Table [x] summarizes the wells' identification numbers, as well as the purpose, location, depths, diameter and screened intervals of the wells. As part of the groundwater monitoring, [x] upgradient wells, [x] on-site wells and [x] downgradient wells are sampled to evaluate the effectiveness of the remedial system. The remedial party will measure depth to the water table for each monitoring well in the network before sampling.

Table [x] – Monitoring Well Construction Details

Monitoring Well ID	Well Location	Coordinates (longitude/latitude)	Well Diameter (inches)	Elevation (above mean sea level)			
				Casing	Surface	Screen Top	Screen Bottom
MW-1	Upgradient	40.7127° N, 74.0059° W	2	517.455	515.06	500.56	495.56

This section should include a discussion of well placement criteria.

- Provide a figure showing the monitoring well network;
- Discuss the depths and units screened (include cross-section);
- Baseline water levels and flow pattern;
- Include a table of sample locations and analytical parameters to be analyzed along with the detection limits and minimum reporting limits to be achieved by the ELAP-certified laboratory; and
- Monitoring well construction details;

Monitoring well construction logs are included in Appendix [x] of this document.

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC project manager will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC project manager. Well abandonment will be performed in accordance with NYSDEC’s guidance entitled “CP-43: Groundwater Monitoring Well

Decommissioning Procedures.” Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC project manager.

The following text should be included in this section:

The sampling frequency may only be modified with the approval of the NYSDEC project manager. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC project manager.

Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

4.4.4 Surface Water Sampling

Surface water sampling will be performed [indicate frequency of required sampling] to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

The network of on-site [and off-site] surface water sample locations has been designed based on the following criteria:

This section should include a discussion of surface water sample location criteria.

- Provide a figure showing the surface water sample locations;
- Discuss the depths of the surface water samples; and
- Include a table of sample locations and analytical parameters to be analyzed along with the detection limits and minimum reporting limits to be achieved by the ELAP-certified laboratory;

The following text should be included in this section:

The sampling frequency may only be modified with the approval of the NYSDEC project manager. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC project manager.

Deliverables for the surface water sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.5 Soil Vapor Sampling

Soil vapor sampling will be performed [indicate frequency of required sampling] to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

The network of on-site [and off-site] soil vapor sample locations has been designed based on the following criteria:

This section should include a discussion of soil vapor sample location criteria.

- Provide a figure showing the soil vapor sample locations;
- Discuss the depths of the soil vapor samples;
- Include a table of sample locations and analytical parameters to be analyzed along with the detection limits and minimum reporting limits to be achieved by the ELAP-certified laboratory;

The following text should appear in this section:

The sampling frequency may only be modified with the approval of the NYSDEC project manager. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC project manager.

Deliverables for the soil vapor sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.6 Soil Vapor Intrusion Sampling

Soil vapor intrusion sampling will be performed [indicate frequency of required sampling] to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

The network of on-site [and off-site] soil vapor intrusion sample locations has been designed based on the following criteria:

This section should include a discussion of soil vapor intrusion sample location criteria.

- Provide a figure showing the soil vapor intrusion sample locations;
- Discuss the depths of the soil vapor intrusion samples; and
- Include a table of sample locations and analytical parameters to be analyzed along with the detection limits and minimum reporting limits to be achieved by the ELAP-certified laboratory.

The following text should appear in this section:

The sampling frequency may only be modified with the approval of the NYSDEC project manager. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC project manager.

Deliverables for the soil vapor intrusion sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.7 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix [x] – Site Management Forms. Other observations (e.g., groundwater monitoring well integrity) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. Additional detail regarding monitoring and sampling protocols are provided in the site-specific Field Activities Plan provided as Appendix [x] of this document.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

If applicable, state:

The site remedy does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

Or:

This Operation and Maintenance Plan provides a brief description of the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the procedures necessary to allow individuals unfamiliar with the site to operate and maintain the [specify EC] systems;
- Will be updated periodically to reflect changes in site conditions or the manner in which the [specify EC] systems are operated and maintained.

Further detail regarding the Operation and Maintenance of the [specify EC] is provided in Appendix [x] – Operation and Maintenance Manual. A copy of this Operation and Maintenance Manual, along with the complete SMP, is to be maintained at the site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of this SMP.

Note: The next portion of the document should cover each of the mechanical ECs individually.

5.2 Remedial System (or other Engineering Control) Performance Criteria

This section should include a table of the minimum operating requirements for the major components of the remedial system, such as design flow rate for extraction wells, basis for

design for air strippers, design flow rate for pressure blowers, etc. This section should also include a description of the discharge requirements, including vapor-phase and aqueous-phase requirements. All discharge permits or permit equivalencies (air, surface water, etc.) will be included as an appendix to this document.

5.3 Operation and Maintenance of [Separate headings should be created for each individual mechanical EC, such as: Sub-slab Depressurization System; Air Sparge/Soil Vapor Extraction System; Groundwater Treatment System; etc.]

The following sections provide a description of the operations and maintenance of [specify EC]. Cut-sheets and as-built drawings for [specify EC] are provided in Appendix [X] – Operations and Maintenance Manual.

Each EC section should have the following sub-headings and associated descriptions, reported individually.

5.3.1 System Start-Up and Testing

This section should include a description of, as appropriate:

- Manufacturer’s recommendations;
- Pre start-up inspection;
- Baseline measurements;
- Testing methods:
 - Checks for leaks;
 - Checks of seals;
 - Check of backdrafts;
 - Pressure tests;
 - System balancing;
 - Warning devices; and
 - Sampling.

The following text should be included in each EC section:

The system testing described above will be conducted if, in the course of the [specify EC] system lifetime, the system goes down or significant changes are made to the system and the system must be restarted.

5.3.2 Routine System Operation and Maintenance

This section should include a brief description of:

- Manufacturer’s recommendations;

- Troubleshooting guide;
- Adjustment and repairs;
- Operation schedule;
- Inspections; and
- Routine maintenance activities and minimum schedules.

A copy of an Operations and Maintenance Manual specific to the remedial systems should be provided in Appendix [x], which will provide further detail on the above.

5.3.3 Non-Routine Operation and Maintenance

This section should include a brief description of:

- Warning devices initiated;
- Damage;
- Reduced effectiveness; and
- System or component replacement.

Table [x] provides a summary and schedule of routine maintenance.

5.3.4 System Monitoring Devices and Alarms

This section should include a description of the remedial system monitoring devices and alarms. Examples of various monitoring devices and alarms for various ECs are provided below:

- AS/SVE systems – system monitoring device and alarm notification for SVE vacuum blower failure; system monitoring device and alarm notification for AS compressor failure; and, system monitoring device for low, high, and high-high water level in moisture separator; and an alarm notification for high-high moisture separator level.
- GWE&T systems – system monitoring device and alarm notification for low-flow from the extraction wells; low-flow through the air stripper; temperature alarm; sound level alarm; etc.

Include the following text in each EC sub-section, where applicable:

The [specify EC] system has a warning device to indicate that the system is not operating properly. In the event that warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the [specify EC] system will be restarted. Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period.

5.3.5 Fire Safety

This section will include descriptions of all fire protection and life safety systems, as well as maintenance, inspection, and record keeping requirements. Topics include, but are not limited to:

- State or local fire inspections
- Fire extinguishers – monthly and annual inspections
- Emergency lighting – 90-minute test
- Sprinklers – monthly and annual inspections
- Emergency exits – free from debris
- Alarm system – local or broadcast
- Electrical system.

The contents of this section will meet or exceed the minimum requirements for building fire protection and life safety systems as described in the Fire Code of New York State. All fire safety items shall comply with federal and state laws as well as local ordinances and building codes. The maintenance and inspections shall conform to NFPA 1584 guidance.

Include in this section:

The remedial party will conduct an annual facility walk with the local fire chief and/or fire suppression team. The site walk will allow for the addition of the facility to any local preplanning efforts. The NYSDEC project manager will be provided with the local fire chief's/fire suppression team's recommendations as soon as they become available. Following review, the NYSDEC project manager may direct the remedial party to implement the recommendations and/or revise the SMP.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

The site management program will include an evaluation of the impact of climate change on the project site and the engineering controls. 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 site management program will include measures to minimize the impact of potential identified vulnerabilities.

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

The SMP should include a climate vulnerability assessment for the site and should describe the method(s) to be used to conduct the vulnerability assessment, the source of information for future climate projections and a list of the assets/vulnerabilities to be included in the evaluation for future assessments. The assessment should also include an evaluation of adaptations to increase the site's and associated remedial systems' resilience to such events.

This section provides a current vulnerability assessment that evaluates the vulnerability of the site and/or engineering controls to severe storms/weather events and associated flooding. This section also identifies vulnerability assessment updates that will be conducted for the site in Periodic Review Reports.

This assessment should include, but not be limited to, a discussion of potential vulnerabilities to be assessed during periodic reviews such as the following:

- **Flood Plain:** Identify whether the site is located in a flood plain, low-lying or low-groundwater recharge area. A flood insurance rate map could assist in that evaluation.

- Sea Level Rise: Identify whether the site is near the shoreline and susceptible to sea level rise or storm surge events (ex: Super Storm Sandy).
- Site Drainage and Storm Water Management: Identify areas of the site which may flood during severe rain events due to insufficient groundwater recharge capabilities or inadequate storm water management systems.
- Erosion: Identify any evidence of erosion at the site or areas of the site which may be susceptible to erosion during periods of severe rain events. Evaluate whether erosion is occurring on sediment caps.
- High Wind: Identify areas of the site and/or remedial system which may be susceptible to damage from the wind itself or falling objects, such as trees or utility structures during periods of high wind.
- Drought: Identify if drought conditions are a concern that may lead to wildfires or decreased groundwater elevations, which may impact site management activities (ex: remedial systems, groundwater monitoring, unexploded munitions, etc.)
- Electricity: Identify the susceptibility of the site/remedial system to power loss and/or dips/surges in voltage during severe weather events, including lightning strikes, and the associated impact on site equipment and operations.
- Spill/Contaminant Release: Identify areas of the site and/or remedial system which may be susceptible to a spill or other contaminant release due to storm-related damage caused by flooding, erosion, high winds, loss of power etc.
- Wildfires: Identify the risk of wildfires in the immediate area and how resulting damage could impact the site (power and vegetation loss, increased erosion etc.)

It is recommended that photographs of any vulnerable areas identified at the site be provided as part of this section.

Incorporate the findings and recommendations from the climate change evaluation into this SMP and Periodic Review Reports.

Resources that may assist with climate change vulnerability assessments include:

- The Climate Explorer (<https://crt-climate-explorer.nemac.org/>)
- Risk Factor (<https://riskfactor.com/>)
- Sea Level Rise Viewer (<https://coast.noaa.gov/slr/#>), National Oceanic and Atmospheric Administration (NOAA)
- DEC Environmental Resource Mapper – Base Flood Elevation Plus 72/75 Inches Sea Level Rise (<https://gisservices.dec.ny.gov/gis/erm/>)
- Landslide Hazards Maps (<https://www.usgs.gov/programs/landslide-hazards/maps>), United States Geological Survey (USGS)
- Green and Sustainable Remediation: A Practical Framework ([Link to Green and Sustainable Remediation: A Practical Framework](#)), Interstate Technology and Regulatory Council (ITRC)
- EPA climate resiliency fact sheets (<https://www.epa.gov/superfund/superfund-climate-resilience>) related to: contaminated sediment sites; contaminated waste containment systems, and groundwater remediation systems.

6.2 Green Remediation Evaluation

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 ensure 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.

Green Remediation Components

Green remediation in Site Management should build off the sustainable or greener cleanup activities evaluated during the remedial investigation or remedy implementation. However, if the relevant evaluations were not performed, then green and sustainable remediation, including climate resiliency, should be evaluated at this stage. Green remediation principals and techniques will be implemented to the extent feasible in the 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; 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.

Environmental Footprint Analysis (Required)

As part of the site management program, to promote implementation of green and sustainable remediation principles, an environmental footprint analysis will be completed and included in this SMP. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise™ (developed by the US military) or a 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 established for the site management activities, as appropriate. Further, progress with respect to green and sustainable remediation metrics will be tracked and reported in periodic review reports and remedial system optimization reports as part of the site management program, and opportunities to further reduce the environmental footprint of the project will be identified as appropriate.

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section provides an environmental footprint analysis of the remedy, as implemented at the time of this SMP. This section of the SMP also provides a summary of green remediation evaluations to be completed for the site during site management and reported in Periodic Review Reports (PRRs).

Discussion and Measurement of Environmental Impacts

This SMP and PRRs should include, but not be limited to, a discussion of items listed below, in relation to the implementation and operation and maintenance of the selected remedy. Where appropriate, quantification of these items should be provided:

- Waste Generation (describe the management of waste associated with the site and any waste reduction projects implemented, including, but not limited to, material reuse and recycling).
- Energy usage (electrical usage for operation of remedial systems, site lighting, security systems, etc.).
- Emissions (vapor-phase remedial system emissions, fuel usage for transportation to and from the site for inspections and/or sampling, operation of gas-powered generators, etc.).
- Water usage (identify sources of decontamination water, irrigation water, etc.). Note that while infiltration systems for runoff may be appropriate green technologies for some sites, elevated protection of groundwater SCOs may indicate a need to minimize infiltration in certain areas and/or at certain sites.
- Land and/or ecosystems (describe any disturbances and restoration of land and/or ecosystems as part of implementation/operation of the remedy).

Making the Remedy Greener

This SMP and PRRs should also consider the following actions to make the remedy greener and more sustainable:

- 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/converted to pollinator habitats and reduce the need for mowing.
- Implement remedies in a more energy-efficient manner. There may be equally protective ways to implement the selected response action 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 remediation 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 itself 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
 - use resource recovery during site management (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:

- Reused PVC pipe;
 - Green concrete;
 - Sustainable building materials; and
 - 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:
 - 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.
 - Captured landfill gas (methane) can be used to produce energy at closed landfills.
 - During site management activities and associated landscape alteration activities, green building strategies such as those outlined in the U.S. Green Building council (USGBC) Leadership in Energy and Environmental Design (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.

Include a list of potential green/sustainable elements identified to be considered during site management in this SMP. This list should consider the selected remedy 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. Methods proposed to reduce energy consumption, resource usage, waste generation, water usage, etc. should be included in this SMP and in PRRs.

Best Management Practices (BMPs)

The SMP should describe best management practices (BMPs) implemented at the site to reduce the environmental footprint in the SMP. Consider EPA’s BMPs related to green remediation (<https://clu-in.org/greenremediation/bmps>) for the applicable program elements, including: site investigation; excavation and surface restoration; soil vapor extraction and other air-driven systems; pump and treat systems; bioremediation; in-situ thermal technologies; landfill cover systems and energy production; materials and waste management. Other guidance may be developed and released over time.

Examples of actions a remedial party can take to green site management are provided to assist in developing the SMP. Site specific evaluations and approaches are welcome and should be presented to the NYSDEC PM during the remedial program for review and approval. Materials and Waste Management should have considered 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 implemented with the approval of NYSDEC's Project Manager.

6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the NYSDEC project manager feels appropriate, (e.g. during significant maintenance events or in conjunction with storm recovery activities).

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities after approval from the DER project manager. Reporting of these modifications will be presented in the PRR.

Include the following sections, as appropriate

6.2.2 Remedial Systems

Remedial systems will be operated properly considering the current site conditions to conserve materials and resources to the greatest extent possible. Consideration will be given to operating rates and use of reagents and consumables. Spent materials will be sent for recycling, as appropriate.

Remedial system types and associated parameters to be evaluated include, but are not limited to:

- Groundwater extraction wells (operating rates/locations);
- Air sparge and soil vapor extraction points (operating rates/locations);
- Activated carbon systems (spent carbon replacement and disposal/regeneration);
- Air strippers;
- Gas venting/collection systems; and
- Leachate collection and disposal.

Add site-specific information on treatment systems.

6.2.3 Building Operations

Structures including buildings and sheds will be operated and maintained to provide for the most efficient operation of the remedy, while minimizing energy, waste generation and water consumption.

Components to be evaluated should include, but are not limited to:

- Heating/cooling systems and temperature set-points;
- Building skin, insulation and building use and occupancy;
- Ventilation;
- Lighting and plug loads; and
- Grounds and property management.

6.2.4 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site, use of consumables in relation to visiting the Site in order to conduct system checks and/or collect samples, and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

Consideration shall be given to:

- Reduced sampling frequencies;
- Reduced site visits and system checks;
- Installation of remote sensing/operations and telemetry;
- Bundling routine system operation checks, inspections, periodic sampling and other site management activities with other nearby sites.
- Coordination/consolidation of activities to maximize foreman/labor time; and
- Use of mass transit for site visits, where available, and carpooling.

Further description of how these items have been considered for the Site should be described in this Section.

6.2.5 Metrics and Reporting

As discussed in Section 7.0 and as shown in Appendix [X] – Site Management Forms, information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits. A set of metrics has been developed and will be evaluated over time to ensure that green remediation actions are achieving the desired results.

Discuss the metrics that will be tracked over time and reported in PRRs. The green remediation metrics form is provided in this template.

6.3 Remedial System Optimization

A Remedial System Optimization (RSO) study will be conducted any time that the NYSDEC project manager or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

If applicable, include the following sentence:

A predefined schedule for RSO evaluation and reporting has been established for this site (see table [X]), although the RSO is not limited to this schedule.

The RSO study will focus on overall site cleanup strategy, process optimization and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness and remedial time frames. Green remediation technology and principals are to be considered when performing the RSO.

The RSO is not a PRR but is complementary to the PRR. While the PRR focuses on the protectiveness of the remedy and compliance with the SMP, and reports on the remedial progress, the RSO focuses on optimization of and improvements to the remedy. An RSO is a thorough evaluation of and implementation of actions that will move the site to closure in a shorter time frame and/or provide cost savings in the long term. Some recommendations developed in the RSO process may address concepts such as:

- Improvements that will make the system more efficient, decrease maintenance costs and downtime, and effectively target the contamination;
- Modification or optimization of a treatment system process;
- Determining whether an in-situ remedy or monitored natural attenuation can replace an active ex-situ treatment remedy;
- Determining the effectiveness of the system versus system shutdown;
- Application of a new technology or remedial approach;
- Improvements that will reduce energy cost or frequency of site visits;
- Evaluation of vendors and disposal arrangements for cost savings;
- Consideration of alternate site management techniques; and
- Implementation of green remediation concepts.

When evaluating the remedial systems (RSO), the following questions should be asked:

1. Is the remedial technology employed at the site appropriate for current site conditions?

Many systems/remedies may be overdesigned, since the design process generally considers worst case scenarios and adds a factor of safety. In addition, a large portion of the contaminant mass may be removed or destroyed in the first few years of operation, after which contaminant mass removal rates generally decrease. This is often the case for groundwater pump and treat remedies. Given these two general factors, the RSO often reveals that current site conditions do not match initial design conditions and much of the system that was put in place during the original design may not be needed or is not cost effective to complete the remediation. For instance, if a groundwater treatment system was designed to treat influent at 100 gallons per minute with concentrations of 1,200 micrograms/liter ($\mu\text{g/L}$) of trichloroethylene (TCE), the system may include an air stripper, two granular activated carbon (GAC) units and a catalytic oxidizer to remove the TCE from the vapor discharge of the air stripper. If, after a year of operation, actual site conditions are flows of 40 gallons per minute and influent TCE concentrations of 250

µg/l, the Professional Engineer could consider removing the air stripper and catalytic oxidizer from the treatment process and treating the influent with two GAC units plumbed in series. This removes two energy-intensive and labor-intensive pieces of equipment from the treatment process, thereby lowering the O&M costs and decreasing the environmental footprint of the remedy.

2. Can green and sustainable technologies be employed to enhance the existing remedy, making it more sustainable, saving costs or bringing the site to closure more quickly?

The RSO will examine site conditions and determine whether the existing remedy can be enhanced by employing green or sustainable technologies. These technologies may include in-situ chemical oxidation or enhanced monitored natural attenuation techniques, or installation of passive venting, solar powered extraction wells, variable-speed drives, geothermal climate control, or tertiary wetland treatment. These technologies may also include activities such as limited excavation and treatment of source area soils that will allow natural attenuation to be the remedy for residual contamination at a site as opposed to the installation of a remediation system.

3. Is the remedy being properly maintained?

As a remedy ages, equipment maintenance becomes an issue as parts wear out and need to be replaced. This generally occurs at the same time there is pressure to reduce O&M costs. The RSO should evaluate effectiveness and efficiency of the system, not just system operation time. Improper maintenance can lead to the system working inefficiently from both a contaminant removal and contaminant destruction aspect. Inefficient contaminant removal or degradation could lead to prolonging the remedial process at a site, while inefficient contaminant destruction could potentially lead to a violation of the regulatory discharge criteria. An example of this would be an improperly maintained air stripper that loses its contaminant mass removal efficiency due to clogging of the air flow pathways. If the stripper is designed to remove 99 percent of the contaminants in the influent and that mass removal efficiency drops to 50 percent due to clogging, the remaining 50 percent of contaminant mass will still be in the effluent from the stripper, which creates a problem.

4. Can the system operation be modified using the existing technology or equipment to be equally or more effective but use less energy?

In the past, remedies often focused on contaminant destruction with little emphasis on energy conservation. During the RSO, the remedy should be examined to determine if the remedial equipment or process can be altered to save energy or maximize contaminant mass removal using the existing technology. An example of this would be operating a Soil Vapor Extraction (SVE) system such that the SVE blower would alternately extract vapor from different groups (legs) of wells for set time intervals. By using such a procedure, the SVE system would remove significant mass from one set of wells for a time and then extract vapors from a different set of wells. During the period when soil vapor is not

being extracted, contaminant mass on the soils is allowed to equilibrate with the soil vapor. This recharging of the soil vapor with contaminants allows for higher mass removal rates once the leg is reactivated. By employing this strategy, a higher contaminant mass removal rate could be achieved using a smaller SVE blower and vapor treatment system. This may be equally effective at removing contaminant mass but would use significantly less energy. However, this procedure should not be used if the SVE system is being used to mitigate soil vapor intrusion into a building.

5. Can the system be taken offline in phases as the site is remediated?

The RSO should evaluate whether parts of the treatment system can be taken offline. Consider whether all of the vapor and groundwater extraction wells are still needed, given the current contaminant plume. In addition, an SVE system can be designed to be converted into a bioventing system to aid in the degradation of heavier compounds not yet stripped from the vadose zone.

6. Is our exit strategy defined well enough or should we enhance it?

Remedies are often implemented with no clear path to closure other than when the established regulatory threshold is met, the remedy is complete, and the site can be closed. This gives a beginning and an end to the process, but no directions to get from one point to the other within the process. An exit strategy provides a path to closure and lays out metrics that, once achieved, lead to the next step or phase of the remedy.

An exit strategy provides the shortest path to closure, which ultimately decreases the environmental footprint of the remedy.

The exit strategy should be short and concise. It defines the cleanup goals and the methods that will be used to assess whether the goals are being attained.

The exit strategy should address stakeholder concerns, meet all applicable regulations, identify all performance metrics, assess costs/risks/future use/benefits of the remedial actions, and identify all requirements to terminate remedial activities at the site. It must also determine the following:

1. How performance of the remedy will be measured.
2. Which decision logic/metrics will be used to select operational changes.
3. How attainment of cleanup goals will be demonstrated.
4. How system(s) operation and long-term monitoring will be terminated.
5. How site closeout will be performed.

The phases of an RSO include:

- Work plan development;
- Work plan implementation (usually includes data gathering and conceptual site model verification);

- RSO Report; and
- Implementation of recommended actions and final report.

7.0. REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix [x]. These forms are subject to NYSDEC revision. All site management inspection, maintenance, and monitoring events will be conducted by a [qualified environmental professional as defined in 6 NYCRR Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State (depending on the need to evaluate engineering controls)].

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table [x] and summarized in the Periodic Review Report.

Table [x]: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Monthly
Periodic Review Report	Annually, or as otherwise determined by the NYSDEC

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC project manager.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQUIS™ database in accordance with the requirements found at this link <http://www.dec.ny.gov/chemical/62440.html>.

7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the NYSDEC project manager beginning sixteen (16) months after the [Certificate of Completion or equivalent document e.g., Satisfactory Completion Letter, No Further Action Letter, etc.] is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted [annually or every third or fifth year, as appropriate] to the NYSDEC project manager or at another frequency as may be required by the NYSDEC project manager. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix [X] - Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site.
- Results of the required annual site inspections, fire inspections and severe condition inspections, if applicable.
- Description of any change of use, import of materials, or excavation that occurred during the certifying period.

- All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- Identification of any wastes generated during the reporting period, along with waste characterization data, manifests, and disposal documentation.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These tables and figures will include a presentation of past data as part of an evaluation of contaminant concentration trends, including but not limited to:
 - Trend monitoring graphs that present groundwater contaminant levels from before the start of the remedy implementation to the most current sampling data;
 - Trend monitoring graphs depicting system influent analytical data on a per event and cumulative basis;
 - O&M data summary tables;
 - A current plume map for sites with remaining groundwater contamination; and
 - A groundwater elevation contour map for each gauging event.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQUIS™ database in accordance with the requirements found at this link: <http://www.dec.ny.gov/chemical/62440.html>.
- A site evaluation, which includes the following:
 - The compliance of the remedy with the requirements of the site-specific Remedial Action Work Plan (RAWP), ROD or Decision Document;
 - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
 - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;

- Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan;
- An update to the climate change vulnerability assessment if site or external conditions have changed since the previous assessment, and recommendations to address vulnerabilities.
- A summary of the Green Remediation evaluation, including a quantitative and qualitative overview of a site's environmental impacts and recommendations to improve the remedy's environmental footprint. The PRR will include the completed Summary of Green Remediation Metrics form provided in Appendix [x].
- An evaluation of trends in contaminant levels in the affected media to determine if the remedy continues to be effective in achieving remedial goals as specified by the RAWP, ROD or Decision Document; and
- The overall performance and effectiveness of the remedy.

If the site has a treatment system add:

- A performance summary for all treatment systems at the site during the calendar year, including information such as:
 - The number of days the system operated for the reporting period;
 - The average, high, and low flows per day;
 - The contaminant mass removed and the cost per pound of mass removed during the certification period and during the life of the treatment system;
 - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
 - A description of the resolution of performance problems;
 - Alarm conditions;
 - Trends in equipment failure;
 - A summary of the performance, effluent and/or effectiveness monitoring; and
 - Comments, conclusions, and recommendations based on data evaluation. Recommendations must address how receptors would be impacted. Recommendations can include:

- Proposals to address efficiency and costs such as: instituting remote operation, system changes to decrease maintenance costs and downtime, and system changes to decrease energy use; and
- Proposals to modify or shut down a treatment system due to remediation completion, system performance or changed conditions. System shutdowns are addressed in Section 6.4 of DER-10.

7.2.1 Certification of Institutional [and Engineering] Controls

Certification of Institutional and Engineering Controls will be included in the Periodic Review Report. If the remedy includes any engineering controls, include the following:

Following the last inspection of the reporting period, a [qualified environmental professional as defined in 6 NYCRR Part 375 or Professional Engineer licensed to practice and registered in New York State (depending on the need to evaluate engineering systems)] will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

“For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*

- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program [and generally accepted engineering practices]; and*
- *The information presented in this report is accurate and complete.*

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

If NYSDEC DER-10 requires a Professional Engineering certification, add the following certification:

“I certify that the New York State Education Department has granted a Certificate of Authorization to provide Professional Engineering services to the firm that prepared this Periodic Review Report.”

If the remedy requires only an institutional control, include the following:

At the end of each certifying period, as determined by the NYSDEC project manager, the following certification will be provided to the NYSDEC project manager:

“For each institutional control identified for the site, I certify that all of the following statements are true:

- *The institutional control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*

- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement.*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class “A” misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or 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.”

For BCP projects which the NYSDEC has determined do not represent a significant threat to public health or the environment, but where contaminants in groundwater exceed drinking water standards, the following should also be included for both IC/EC and IC scenarios listed above:

- *No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and*

For BCP projects, every five years the following certification will be added:

- *The assumptions made in the qualitative exposure assessment remain valid.*

The signed certification will be included in the Periodic Review Report.

The Periodic Review Report will be submitted, in electronic format, to the NYSDEC project manager and the NYSDOH project manager. The Periodic Review Report may also need to be submitted in hard-copy format if requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control or failure to conduct site management activities, a Corrective Measures Work Plan will be submitted to the NYSDEC project manager for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC project manager.

7.4 Remedial System Optimization Report

If an RSO is to be performed (see Section 6.3), upon completion of an RSO, an RSO report must be submitted to the NYSDEC project manager for approval. A general outline for the RSO report is provided in Appendix [X]. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC project manager and the NYSDOH project manager.

8.0 REFERENCES

A listing of all site-specific reports utilized for preparation of the SMP should be included in this section.

6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

NYSDEC DER-10 – “Technical Guidance for Site Investigation and Remediation”.

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

APPENDIX [x] – LIST OF SITE CONTACTS

This Appendix should include a listing of all site contacts. The table below should be edited as necessary to include all site contacts necessary for implementation of the SMP.

Name	Phone/Email Address
[Site Owner]	[phone] [email address]
[Remedial Party]	[phone] [email address]
[Qualified Environmental Professional]	[phone] [email address]
[Remedial Engineer]	[phone] [email address]
[NYSDEC DER Project Manager]	[phone] [email address]
[NYSDEC DER Project Manager's Supervisor]	[phone] [email address]
[NYSDEC Site Control]	[phone] [email address]
[NYSDOH Project Manager]	[phone] [email address]
[On and off-site access contacts such as tenants, adjacent property owners, etc.]	[phone] [email address]
[Remedial Party Attorney]	[phone] [email address]

APPENDIX [X] – EXCAVATION WORK PLAN (EWP)

This plan is similar to a Remedial Action Work Plan and can be largely drawn from the approved site-specific version of that final document.

[X]-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination or breach or alter the site’s cover system, the site owner or their representative will notify the NYSDEC contacts listed in the table below. Table [x] includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix [x].

Table [x]: Notifications*

[NYSDEC Project Manager]	[phone] [email address]
[NYSDEC Project Manager’s Supervisor]	[phone] [email address]
[NYSDEC Site Control]	[phone] [email address]

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated, any modifications of truck routes, and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of

concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;

- A schedule for the work, detailing the start and completion of all intrusive work, and submittals (e.g., reports) to the NYSDEC documenting the completed intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP, 29 CFR 1910.120 and 29 CFR 1926 Subpart P;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix [x] of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with the required request to import form and all supporting documentation including, but not limited to, chemical testing results.

The NYSDEC project manager will review the notification and may impose additional requirements for the excavation that are not listed in this EWP. The alteration, restoration and modification of engineering controls must conform with Article 145 Section 7209 of the Education Law regarding the application professional seals and alterations.

[X]-2 SOIL SCREENING METHODS

Soil screening methodology, including a photoionization detector (PID) screening level, should be described here. The following text should be included in this section:

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed during all excavations into known or potentially contaminated material (remaining contamination) or a breach of the cover system. A qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State will perform the screening. Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section [X] of this Appendix.

[X]-3 SOIL STAGING METHODS

This section should provide details describing erosion and sedimentation controls for stockpiles. This section should be consistent with Section [X]-11 Stormwater Pollution Prevention of this Appendix.

The following text should be included in this section:

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

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.

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 the NYSDEC.

[X]-4 MATERIALS EXCAVATION AND LOAD-OUT

This section should describe all methods to be followed for materials loading and on-site management prior to leaving the site. Include all decontamination procedures, in addition to the truck wash procedures included below.

During excavation, the remedial party should make efforts to minimize the environmental footprint. 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.

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
- Biodiesel, particularly if made from recycled byproducts.

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

The following text should be included in this section:

A qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site. A site utility stakeout will be completed for all utilities prior to any ground intrusive activities at 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). Trucks

transporting contaminated soil must have either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides.

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

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

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials. Material accumulated from the street cleaning and egress cleaning activities will be disposed off-site at a permitted landfill facility in accordance with all applicable local, State, and Federal regulations.

[X]-5 MATERIALS TRANSPORT OFF-SITE

This section should describe all methods to be followed for materials management while in transport off-site. 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

The remedial party should make efforts to minimize the environmental footprint during transport. 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);
- Restrict idling of trucks waiting to be loaded; and
- Biodiesel, particularly if made from recycled byproducts.

The remedial party can also use railroad service to transport waste, which often uses less energy than trucking.

The following text should be included 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.

Material transported by trucks exiting the site will be secured with either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

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. 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.

[X]-6 MATERIALS DISPOSAL OFF-SITE

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

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed off-site in a permitted facility in accordance with all local, State and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC project manager. Unregulated off-site management of materials from this site will not occur without formal NYSDEC project manager approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, (e.g. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C&D debris recovery facility). Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include, but will not be limited to: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled consistent with 6 NYCRR Parts 360, 361, 362, 363, 364 and 365. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State C&D debris recovery facility (6 NYCRR Subpart 360-15 registered or permitted facility).

[X]-7 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 originates at the site and which does not leave the site during the excavation. Material reuse on-site will comply with the requirements of NYSDEC DER-10 Section 5.4(e)4. The following topics should be covered:

- Procedure for determining if reuse is appropriate:
 - Sampling (methods and analytical)
 - Stockpile segregation scheme for on-site reuse
- Size of stockpiles, location (figure)

The following text should be included in this section:

The qualified environmental professional, as defined in 6 NYCRR Part 375, will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material (i.e. contaminated) does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within the cover system or within landscaping berms. Contaminated on-site material may only be used beneath the site cover as backfill for subsurface utility lines with prior approval from the DEC project manager.

Proposed materials for reuse on-site must be sampled for full suite analytical parameters including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the site use criteria presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances [November 2022 or date of current version, whichever is later] guidance values. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

Soil/fill material for reuse on-site will be segregated and staged as described in Sections X-2 and X-3 of this EWP. The anticipated size and location of stockpiles will be

provided in the 15-day notification to the NYSDEC project manager. Stockpile locations will be based on the location of site excavation activities and proximity to nearby site features. Material reuse on-site will comply with requirements of NYSDEC DER-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

[X]-8 FLUIDS MANAGEMENT

The following text should be included in this section:

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed off-site at a permitted facility in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

[X]-9 COVER SYSTEM RESTORATION

The following text should be included in this section:

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the [RAWP, decision document, or

Record of Decision]. The existing cover system is comprised of a minimum of [12 or 24 inches of clean soil, asphalt pavement, concrete covered sidewalks and concrete building, etc.]. The demarcation layer, consisting of [orange snow fencing material, white geotextile or equivalent material, etc.] will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), (possibly “as shown on Figure [x]”) this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP. The alteration, restoration and modification of engineering controls must conform with Article 145 Section 7209 of the Education Law regarding the application professional seals and alterations.

[X]-10 BACKFILL FROM OFF-SITE SOURCES

This section should describe all methods to be followed for the import, handling and placement of backfill material from off-site. The requirements for backfill used at the site should be consistent with the backfill requirements provided in DER-10 (e.g., Appendix 5).

The following topics should be covered:

- Source area approval process
 - Sources of backfill material
- Source area background check
- DOT Certification
 - Chemical sampling
- Analytes
- Frequency
 - Imported Soil Chemical Quality Standards
- Applicability of protection of groundwater SCOs
- Applicability of protection of ecological resources SCOs
- Stockpile procedures for imported backfill material
 - Size of stockpiles, cover, etc.

The following text should be included in this section:

All materials proposed for import onto the site will be approved by the qualified environmental professional, as defined in 6 NYCRR Part 375, and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at <http://www.dec.ny.gov/regulations/67386.html>, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review. A copy of the form is presented in Appendix [X].

Material from industrial sites, spill sites, other environmental remediation sites, or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d) and DER-10 Appendix 5 for [insert site use (ex. residential use)]. Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table [X]. 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 project manager. Soil material will be sampled for the full suite of analytical parameters, including PFAS and 1, 4-dioxane. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

[X]-11 STORMWATER POLLUTION PREVENTION

For large excavations, but less than 1 acre, procedures for stormwater pollution prevention should be specified in the EWP. For construction projects exceeding 1 acre, this is required. A summary of the Stormwater Pollution Prevention Plan that conforms to the requirements of the NYSDEC Division of Water guidelines and NYS regulations should be included here. The plan itself may be included as an Appendix to the EWP. The following text should appear 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 the 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 SMP 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 construction area.

[X]-12 EXCAVATION CONTINGENCY PLAN

Describe the procedures to be followed upon discovery of an unknown source of contamination that may require remediation (USTs, stained soil, drums, etc.). This should include procedures for suspending excavation work, pumping fluids from tanks or containers, and reporting to the spill hotline. Include the following text:

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition. The NYSDEC project manager will be promptly notified of the discovery.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes [TAL metals, TCL volatiles and semi-volatiles (including 1,4-dioxane), TCL pesticides and PCBs, and PFAS], unless the site history and previous sampling results provide sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC project manager for approval prior to sampling. Any tanks will be closed as per NYSDEC regulations and guidance.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone within two hours to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

[X]-13 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;
- Air monitoring methods;
- Analytes measured and instrumentation to be used;
- A figure of the location(s) of all air monitoring instrumentation. A figure showing specific locations must be presented for monitoring stations based on generally prevailing wind conditions, with a note that the exact locations to be monitored on a given day will be established based on the daily wind direction.

The following text should be included somewhere in this section:

A figure showing the location of air sampling stations based on generally prevailing wind conditions is shown in Figure [x]. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. If a sensitive receptor, such as a school, day care or residential area is adjacent to the site, a fixed monitoring station should be located at that site perimeter, regardless of wind direction, and discussed in the text.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

Include the text below if ground-intrusive activities could occur within 20 feet of potentially exposed individuals or structures.

[X]-13A: Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 part-per-million, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any

unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 micrograms per cubic meter, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 micrograms per cubic meter or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Include the text below if ground-intrusive activities could occur indoors with co-located residences or facilities.

[X]-13B: Special Requirements for Indoor Work with Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under “Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures” except that in this instance “nearby/occupied structures” would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

[X]-14 ODOR CONTROL PLAN

The following text should be included as part of 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 at the site boundary, or if odor complaints are received, 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 any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (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 other measures as necessary].

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

[X]-15 DUST CONTROL PLAN

Particulate monitoring must be conducted according to the Community Air Monitoring Plan (CAMP) provided in Section [X]-13. If particulate levels at the site exceed the thresholds listed in the CAMP or if airborne dust is observed on the site or leaving the

site, the dust suppression techniques listed below will be employed. The remedial party will also take measures listed below to prevent dust production on the site.

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 using 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.
- 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 truck sprinkling.

Add other measures that will be taken to prevent dust production and suppress dust. Field generation of contaminated or uncontaminated dust and mobilization of volatile organic compounds may be reduced by new and traditional Best Management Practices (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 can be implemented with the approval of NYSDEC's Project Manager.

[X]-16 OTHER NUISANCES

The following items may be necessary depending on the type of wastes present, the location of the site and other site-specific concerns. These plans are generally not required for submission to the 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 to ensure compliance with local noise control ordinances.

APPENDIX [X]
RESPONSIBILITIES of
OWNER and REMEDIAL PARTY

Responsibilities

This page may be used when site management responsibilities are to be carried out by multiple parties. For example, it can be used when a Remedial Party does not own the site property, and, therefore, must share site management and/or reporting obligations with a site owner, or when the State is operating a remedial system or otherwise carrying out site management.

The responsibilities for implementing the Site Management Plan (“SMP”) for the [Insert Site Name] site (the “site”), number [Insert Site Number], are divided between the site owner(s) and a Remedial Party, as defined below. The owner(s) is/are currently listed as: [Insert site owners’ names, contacts and addresses] (the “owner”).

Solely for the purposes of this document and based upon the facts related to a particular site and the remedial program being carried out, the term Remedial Party (“RP”) refers to any of the following: certificate of completion holder, volunteer, applicant, responsible party, and, in the event the New York State Department of Environmental Conservation (“NYSDEC”) is carrying out remediation or site management, the NYSDEC and/or an agent acting on its behalf. The RP is:

[Insert RP’s name, contact and address].

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the site.

Site Owner’s Responsibilities:

- 1) The owner shall follow the provisions of the SMP as they relate to future construction and excavation at the site.
- 2) In accordance with a periodic time frame determined by the NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in a(n) [Select one-Environmental Easement, Deed Restriction, Environmental Notice] remain in place and continue to be complied with. The owner shall provide a written certification

to the RP, upon the RP's request, in order to allow the RP to include the certification in the site's Periodic Review Report (PRR) certification to the NYSDEC.

- 3) In the event the site is delisted, the owner remains bound by the [Select one-Environmental Easement, Deed Restriction, Environmental Notice] and shall submit, upon request by the NYSDEC, a written certification that the [Select one-Environmental Easement, Deed Restriction, Environmental] is still in place and has been complied with.
- 4) The owner shall grant access to the site to the RP and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.
- 5) The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. If damage to the remedial components or vandalism is evident, the owner shall notify the site's RP and the NYSDEC in accordance with the timeframes indicated in Section [xxx]-Notifications.
- 6) If some action or inaction by the owner adversely impacts the site, the owner must notify the site's RP and the NYSDEC in accordance with the time frame indicated in [Section xxx]- Notifications and coordinate the performance of necessary corrective actions with the RP.
- 7) The owner must notify the RP and the NYSDEC of any change in ownership of the site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the site property/ies. 6 NYCRR Part contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 1.3 of the SMP. A change of use includes, but is not limited to, any activity that may increase direct human or environmental exposure (e.g., day care, school or park). A 60-Day Advance Notification Form and Instructions are found at <http://www.dec.ny.gov/chemical/76250.html>.
- 8) If an owner has a written agreement to perform work for the RP, a description of the activities may be inserted here. (The corresponding agreement should also be included in the SMP.) The owner will [insert activities here: maintain fences, conduct mowing, etc] on behalf of the RP. The RP remains ultimately responsible for maintaining the engineering controls.

- 9) If the site remedy requires the installation, operation, and/or maintenance of an on-site vapor intrusion mitigation system insert the following: Until such time as the NYSDEC deems the vapor mitigation system unnecessary, the owner shall operate the system, pay for the utilities for the system's operation, and report any maintenance issues to the RP and the NYSDEC.

- 10) If the site remedy requires the installation, operation, and/or maintenance of a drinking water treatment system, insert the following: Until such time as the NYSDEC deems the drinking water treatment system unnecessary, the owner shall operate the drinking water treatment system, pay for the utilities and report any maintenance issues to the RP and the NYSDEC.

- 11) In accordance with the tenant notification law, within 15 days of receipt, the owner must supply a copy of any vapor intrusion data, that is produced with respect to structures and that exceeds NYSDOH or OSHA guidelines on the site, whether produced by the NYSDEC, RP, or owner, to the tenants on the property. The owner must otherwise comply with the tenant and occupant notification provisions of Environmental Conservation Law Article 27, Title 24.

Remedial Party Responsibilities

- 1) The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the site.

- 2) The RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.

- 3) Before accessing the site property to undertake a specific activity, the RP shall provide the owner advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) the NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the site visit and/or any final report produced.

- 4) If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner(s).

- 5) The RP shall notify the NYSDEC and the owner of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any remedial system

(Engineering Controls). The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at <http://www.dec.ny.gov/chemical/76250.html> .

- 6) The RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section [xxx]- Notifications of the SMP.
- 7) The RP is responsible for the proper maintenance of any installed vapor intrusion mitigation systems associated with the site, as required in Section [X] or Appendix [X] (Operation, Monitoring and Maintenance Manual) of the SMP.
- 8) The RP is responsible for the proper monitoring and maintenance of any installed drinking water treatment system associated with the site, as required in Section [X] or Appendix [X] (Operation, Monitoring and Maintenance Manual).
- 9) Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to the NYSDEC for approval an amended SMP.
- 10) Any change in use, change in ownership, change in site classification (*e.g.*, delisting), reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the NYSDEC project manager to discuss the need to update such documents.

Change in RP ownership and/or control and/or site ownership does not affect the RP's obligations with respect to the site unless a legally binding document executed by the NYSDEC releases the RP of its obligations.

Future site owners and RPs and their successors and assigns are required to carry out the activities set forth above.

APPENDIX [X] – ENVIRONMENTAL EASEMENT

This Appendix should include a copy of the Environmental Easement or appropriate deed restriction, environmental notice, etc. The figure/survey that shows the restricted areas must also be included in this Appendix as one is not always filed with the county clerk. In addition, this Appendix should include copies of any required access agreements of other properties required to perform site management activities.

APPENDIX [x] – FIELD SAMPLING PLAN

This Appendix should be consistent with the protocols developed during the investigation phase of the project, and should include a description of:

- Well gauging;
- Well purging;
- Sampling methodology (soil, groundwater, sediment, soil vapor, system sampling, etc.);
- Analytical methodology:
 - Lab certification;
 - Analytical methods;
 - Analytes.

APPENDIX [x] – QUALITY ASSURANCE PROJECT PLAN

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site. Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
 - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
 - Sample holding times will be in accordance with the NYSDEC ASP requirements.
 - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
 - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
 - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.
- Assessing achievement of the remedial performance criteria.
- Preparing the necessary reports for the various monitoring activities.
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;

APPENDIX [x] – HEALTH AND SAFETY PLAN

A Health and Safety plan (HASP) and associated Community Air Monitoring Plan (CAMP) will be prepared by a qualified person in accordance with the most recently adopted and applicable general industry (29 CFR 1910) and construction (29 CFR 1926) standards of OSHA, the U.S. Department of Labor, as well as any other federal, state or local applicable statutes or regulations. The CAMP must include the appropriate requirements identified by the NYSDOH, including special requirements for work within 20 Feet of potentially exposed individuals or structures and special requirements for indoor work with co-located residences or facilities. The Excavation Work Plan template outlines these special requirements. Both documents shall be prepared in accordance with NYSDEC's DER-10. At a minimum, the HASP will include a description of the health and safety procedures associated with both performance monitoring of the remedial system(s) and effectiveness monitoring. A copy of the HASP will be available at the site during the conduct of all activities to which it is applicable.

APPENDIX [x]
SITE MANAGEMENT FORMS

This Appendix should include all site-specific site management forms including site inspection form, routine operation and maintenance forms and non-routine operations and maintenance forms for the site. The forms should be completed during site maintenance activities and provided to the NYSDEC in electronic format in accordance with the reporting requirements specified in Section 7.0 of the SMP. All forms presented are subject to approval of the NYSDEC and should include the minimum reporting requirements as described in Section 7.0.

Summary of Green Remediation Metrics for Site Management

Site Name: _____ Site Code: _____
 Address: _____ City: _____
 State: _____ Zip Code: _____ County: _____

Initial Report Period (Start Date of period covered by the Initial Report submittal)

Start Date: _____

Current Reporting Period

Reporting Period From: _____ To: _____

Contact Information

Preparer’s Name: _____ Phone No.: _____
 Preparer’s Affiliation: _____

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	Total to Date
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	Total to Date (tons)
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		
Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies and lab-supplied bottles, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	Total to Date (miles)
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service (bottle and sample delivery)		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	Total to Date (gallons)
Total quantity of water used on-site (not including treated water)		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	Total to Date (acres)
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Recommendations/Other:

CONTRACTOR CERTIFICATION
I, _____ (Name) do hereby certify that I am _____ (Title) of _____ (Contractor Name), which is responsible for the work documented on this form. According to my knowledge and belief, all of the information provided in this form is accurate and the site management program complies with the DER-10, DER-31, and CP-49 policies.

Date Contractor

APPENDIX [x]
O&M MANUAL (FOR EACH ACTIVE EC)

The O&M Manual provides protocols for the operation and maintenance of a remedial system. The procedures detailed in the O&M Manual do not replace the manufacturer's documents for specific remedial components but rather supplement such documents and provide for a concise, organized reference document for the remedial system and associated remedial components for operation and maintenance.

The O&M Manual will include all as-built drawings and catalog-cuts on all fixed and mobile equipment necessary to operate and maintain the remedial system including any pumps, blower, air strippers, etc. Catalog-cuts will include maintenance procedures, spare parts lists, and any special tool requirement as well as vendor/service contact/local dealer information, including address and telephone numbers.

The O&M Manual is to be revised on a periodic basis and must be kept up to date by the remedial party.

APPENDIX [x]

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REMEDIAL SYSTEM OPTIMIZATION FOR [Site Name]

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APPENDIX [x]
REQUEST TO IMPORT/REUSE FILL MATERIAL FORM