ARTHUR KILL CORRECTIONAL FACILITY FIRING RANGES

RICHMOND COUNTY

STATEN ISLAND, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: 243039

Prepared for:

New York State Department of Corrections and Community Supervision

Building 2

1220 Washington Ave

Albany, New York 12226

and

New York State Office of General Services

Mayor Erastus Corning Second Tower

The Governor Nelson A. Rockefeller Empire State Plaza

Albany, New York 12242

Prepared by:

C&S Engineers, Inc.

141 Elm Street Suite 100

Buffalo, NY 14203

716-847-1630

Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

August 2018

CERITICATION STATEMENT

I, Robert N. Duclos, certify that I am currently a NYS registered Professional Engineer as 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).

Robert N. Duclos P.E.

8/23/18 Date

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SITE MANAGEMENT PLAN

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AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
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
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Green House 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
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
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:

Site Identification: 243039 Arthur Kill Correction Facility Firing Ranges

Institutional Controls:	1. The property may be used for commercial and industrial use;
	2. The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Richmond County 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;
	3. Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
	4. All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
	5. 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; and
	6. Vegetable gardens and farming on the site are prohibited.

Inspections:	Frequency
1. Site-Wide Inspection	Annually
Reporting:	
1. Inspections	Annually

2. Periodic Review Report	Every three years

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 Arthur Kill Correctional Facility Firing Ranges located in Staten Island, New York (hereinafter referred to as the "Site"). See Figure 1. The Site is currently in the New York State (NYS) Inactive Hazardous Waste Disposal Site Program (State Superfund) Site No. 243039 which is administered by New York State Department of Environmental Conservation (NYSDEC).

The New York State Department of Corrections and Community Service (NYSDOCCS) entered into an Order on Consent on December 28, 2013 with the NYSDEC to remediate the site. A figure showing the site location and boundaries of this site is provided in Figure 2. 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 A.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional Controls (ICs) 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 Richmond 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 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 release letter;

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the Order on Consent (Index #R2-0816-13-10; Site #243039) 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 B of this SMP.

This SMP was prepared by C&S Engineers, Inc., on behalf of NYSDOCCS, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May, 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs that are required by the Environmental Easement for the site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the site, the NYSDEC

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:

- Written 60-day advance notice of any proposed changes in site use that are required under the terms of the Order on Consent, 6NYCRR Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the remedial program.
- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.

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

- 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 Order on Consent, and all approved work plans and reports, including this SMP.
- 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 1 on the following page 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 B.

Table 1: Notifications*

Name	**Contact Information**
Jane O'Connell NYSDEC Regional HW Remediation Engineer	718.482.4599 jane.oconnell@dec.ny.gov
Kelly Lewandowski NYSDEC Site Control Section Chief	518.402.9569 kelly.lewandowski@dec.ny.gov

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

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The site is located in Staten Island, Richmond County, New York and is identified as Borough Staten Island Block 7187 and Lot 1 on the New York City Tax Map (see Figure 2– Site Layout Map). The site is an approximately 1.84-acre area and is bounded by the Arthur Kill to the north, the remainder of the 81-acre Arthur Kill Correction Facility to the south, wetlands to the east, and industrial parcels including an auto repair facility to the west (see Figure 2). The boundaries of the site are more fully described in Appendix A – Environmental Easement. The owner(s) of the site parcel(s) at the time of issuance of this SMP is/are:

The New York State Department of Corrections and Community Supervision

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: a vacant space and a firing range. The Site is zoned M3-1, which is a special purpose district "designated for areas with heavy industries that generate noise, traffic or pollutants" that are "potentially noxious" according to the New York City Department of Planning. Additionally, typical uses in this zoning are "power plants, solid waste transfer facilities and recycling plants, and fuel supply depots." The Site is currently vacant, with the exception of a firing range that is currently not in use.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include industrial properties. The properties immediately south of the Site include industrial and commercial properties generally zoned M2-1 with residential properties beyond the West Shore Expressway, which acts as a buffer; the properties immediately north of the Site across the Arthur Kill include heavy industrial properties;

the properties immediately east of the Site include M3-1 zoned industrial properties; and the properties to the west of the Site include M3-1 zoned industrial properties.

2.2.2 Geology

USDA soil surveys indicate that native site soils belong to the Riverhead Group, a Class B hydrologic group consisting of sandy loams, that are moderately well to well drained and deep to moderately deep. These soils do not generally meet the requirements for hydric soil.

Soil borings advanced on the Site show that the dominant unconsolidated material at the Site is red to brown to black fine to medium sand with trace to some silt. In select borings, the native material also included tan to gray to black silts and clays. Fill material used during the construction of the firing ranges was characterized, and the results did not identify a significant environmental concern associated with the fill material.

Bedrock has not been encountered during subsurface explorations at the Site, although drilling depths were limited to approximately fifteen feet below grade. Available literature describes bedrock beneath the site as a stratified sequence from the Mesozoic Era, Cretaceous System, and Upper Cretaceous Series.

Site specific boring logs are provided in Appendix C.

2.2.3 Hydrogeology

The depth to the water table is generally greater than six feet except within the on-site freshwater wetlands. Groundwater flows towards the Arthur Kill from adjacent upland areas. Hydraulic conductivities were not quantified during the investigative work at the Site but are expected to be relatively high based on the dominance of sand as the primary overburden material. Private and public water supply wells are not known to be located near the Site.

A groundwater contour map is shown in Figure 3. Groundwater elevation data is provided in Table 2. Groundwater monitoring well construction logs are provided in Appendix C.

2.3 Investigation and Remedial History

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 7.0 - References.

The Arthur Kill Correctional Facility was purchased by the NYSDOCCS on May 6, 1976 from the New York State Narcotic Addiction Control Commission (NYSNACC), which had occupied the Site since 1969. NYSDOCCS operated two firing ranges on the Site. The Old Firing Range was reputedly first used in 1979 by corrections officers and by other agencies for the practice of pistol and shotgun marksmanship. The Old Firing Range remained in use until approximately 2005 when the New Firing Range was constructed immediately to the west. The Old Firing Range was abandoned at that time and the New Firing Range, which accommodates rifles as well as pistols and shotguns, was used from that time until the Arthur Kill Correctional Facility was closed in 2010.

The following site assessments/investigations occurred at the Site:

- In 2004, an environmental investigation of the Site was conducted and consisted of the sampling and analyses for total lead of 15 select soil samples collected in the Firing Ranges. The report did not identify the sampling locations but indicated that the samples were collected from depth intervals that ranged from the surface to 12 inches below the ground surface (bgs) within the Shotgun Range and the Rifle Range. Lead concentrations ranged from 910 to 11,265 ppm from soils collected in the Old Firing Range and less than 40 ppm to 29,380 ppm from soils collected in the New Firing Range. These values exceed the NYSDEC's Soil Cleanup Objectives.

- A 2006 Remedial Investigation (RI) included the analysis of five surface soil samples; five shallow subsurface soil samples; 120 soil borings and associated subsurface soil samples; wood sampling for waste characterization purposes; and the installation and sampling of five micro-wells. The results of the RI confirmed that the only contaminant of concern was lead, which was present only at shallow depths at concentrations significantly above the then-current guidance values.
- A 2012 supplemental investigation included 14 borings to characterize the fill material used in the berms that were placed during the construction of the firing ranges. The results indicated that contaminant concentrations were, with the exception of lead, consistent with the Site's urban setting. Certain lead concentrations exceeded the NYSDEC's SCOs.
- A 2013 subsurface investigation was conducted to provide additional delineation of lead impacts in shallow soils. The sampling program included soils collected from 32 locations as well as non-soil materials such as rubber target media and wood in timbers and trees for disposal characterization purposes.
- To address lead in the site soils in the firing ranges, Interim Remedial Measures (IRMs) were completed in 2014 and 2015. The IRMs for the Site consisted of the clearing of vegetation in the remediation areas and the excavation of soil to depths of six to 12 inches in the Former Firing Range and a small portion of the New Firing Range. The bullet-containing rubber material in the bullet trap of the New Firing Range was also removed. Confirmatory sampling indicates that the IRMs were effective in remediating the Site's soil. Following implementation of the IRMs, lead concentrations in remaining soils at the Site were under the Residential Use SCO, which was used as the guidance value as per the NYSDEC approved IRM/SC Work Plan.
- Following the IRMs, a Site Characterization was completed in 2015 to determine if contamination remains at the Site following the IRM and, if

present, to identify the nature and extent of that contamination. The Site Characterization consisted of the collection and analysis of surface soil samples, subsurface soil samples, and groundwater samples. The results of the Site Characterization demonstrated that the IRMs removed the vast majority of lead-impacted soil across the Site, although some slightly elevated concentrations were identified in a few locations. Additional analytes such as pesticides, SVOCs, and other metals were also detected at slightly elevated concentrations in select soil locations. These results did not exceed the Commercial Use SCOs, suggesting that a deed restriction may be a useful tool in limited future development of the Site to uses that preclude residential development. Groundwater quality was shown to exhibit no impacts from the recently removed lead contaminants.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site are as follows:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

2.5 Remaining Contamination

2.5.1 Soil

2.5.1.1 Surface Soil

This section describes the implications of the surface soil sampling results (0 to 2 inches below grade) as well as the supplemental sampling program (0 to 12 inches below grade).

Several pesticides were detected in the surface soils at concentrations above Unrestricted Use SCOs but generally below Residential Use SCOs, indicating that these analytes do not pose a significant threat to human health or the environment. As the Site was first developed in 1969 and the use of DDT was banned in 1972, it is unlikely that operations at the Site used these pesticides to any significant degree. Therefore, the presence of pesticides may be related to the industrial nature of the area and the intensive use of the area along the Arthur Kill. An alternative explanation is that these pesticides were sometimes applied over wide areas to control insects, and the presence of these compounds therefore on-site may be associated with area-wide applications.

Lead, mercury, nickel and zinc levels exceeding Unrestricted Use SCOs were detected in the surface soil samples collected from the Site. Like the pesticides, these metals were detected at concentrations below the Residential Use SCOs, indicating they do not pose a significant threat to human health or the environment. The presence of these metals is likely due to the historical industrial operations at facilities surrounding the Site as well as the use of fill during the construction of the New Firing Range.

In the supplemental samples collected from the Old Firing Range, lead concentrations were above the Unrestricted Use SCOs in seven of the 12 locations, and one lead concentration exceeded the Restricted Residential Use SCO. Copper, mercury, and zinc were also detected at concentrations above the Unrestricted Use SCOs. These concentrations may be attributable to the industrial nature of the surrounding area, although the lead concentrations are also likely due, in large part, to the use of the area as a firing range.

2.5.1.2 Subsurface Soil

Several pesticides were detected in the subsurface soils collected from the Site at concentrations exceeding Unrestricted Use SCOs but generally below Residential Use SCOs. One analyte concentration exceeded Residential Use SCOs but was below Restricted Residential Use SCOs. For the same reasons as described for the surface soils, the presence of these pesticides in the subsurface soils at relatively low levels may be related to the industrial nature of the surrounding area rather than use of those pesticides in on-site operations.

SVOCs, specifically polynuclear aromatic hydrocarbons (PAHs), were detected at concentrations above the Restricted Residential Use SCOs but below the Commercial Use SCOs in test pit TP-4, within the boundary of the New Firing Range. The presence of these contaminants is likely related to the placement of fill during the construction of the berms for the New Firing Range. PAHs are often the results of the incomplete combustion of hydrocarbons and other organic material and are commonly encountered in urban soils. Based on their relatively low concentrations at the Site and their ubiquity in urban settings, the presence of SVOCs in the subsurface soils at the Site does not suggest an on-site source nor does it represent a significant concern at the Site.

Lead, mercury and arsenic concentrations exceeding Unrestricted Use SCOs were detected in subsurface soils collected from the Site. These analytes were detected at concentration below Residential Use SCOs. Like the PAHs, the presence of these metals in the subsurface soil at slightly elevated concentrations is also likely due to the use of fill during the construction of the New Firing Range.

Table 3, Table 3.1 and Figure 4 summarize the results of all soil samples collected that exceed the Unrestricted Use SCOs, Residential, and Restricted Residential Use SCOs at the site after completion of remedial action.

2.5.2 Groundwater

During the most recent groundwater sampling event, following implementation of the IRMs, four total metals were detected above state standards and guidance values. These include:

- Arsenic (1 of 4 wells)
- Iron (4 of 4 wells)
- Manganese (4 of 4 wells)
- Sodium (3 of 4 wells)

Samples were also analyzed for dissolved metals during the second sampling event. Analytical results indicated that only three metals were detected in the filtered samples at concentrations above state standards and guidance values. These include:

- Iron (3 of 4 wells)
- Manganese (3 of 4 wells)
- Sodium (2 of 4 wells)

Lead was not detected in the total and dissolved metals samples during the most recent sampling event.

In these samples, the metals detected at concentrations above groundwater standards and guidance values were limited to iron, manganese, and sodium. These contaminants are commonly found in uncontaminated environments and do not appear to be associated with the historical contamination at the Site. These elements are often associated with aesthetic issues in water and do not represent a significant environmental concern.

Table 4 and Figure 5 summarize the results of all samples of groundwater that exceed the SCGs after completion of the remedial action.

3.0 INSTITUTIONAL CONTROL PLAN

3.1 General

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

This plan provides:

- A description of all ICs on the site;
- The basic implementation and intended role of each IC;
- 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 ICs, such as the implementation of the Excavation Work Plan (EWP) (as provided in Appendix D), the Sampling and Analysis Plan (as provided in Appendix E) and the Health and Safety Plan (HASP) (as provided in Appendix F) 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 ICs required by the site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

A series of ICs is required to: (1) prevent future exposure to remaining contamination; and, (2) limit the use and development of the site to commercial or industrial 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 2, and described in Appendix A. These ICs are:

- The property may be used for: commercial and industrial use;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene 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;
- 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;
- 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; and
- Vegetable gardens and farming on the site are prohibited.

3.3 Site – wide Inspection

Site-wide inspections will be performed at a minimum of once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect the remaining contamination at the site. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report.

During an inspection, an inspection form will be completed as provided in Appendix G – Site Management Forms. The inspections will determine and document the following:

Compliance with all ICs, including site usage;

- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and

- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- If site records are complete and up to date.

Reporting requirements are outlined in Section 5.0 of this plan.

Inspections will also be performed in the event of an emergency. An inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the ICs implemented at the site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC 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.

4.0 PERIODIC ASSESSMENTS/EVALUATIONS

4.1 Climate Change Vulnerability Assessment

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.

Because the remedy at the Site does not involve an active remedial system or engineering controls and is only a restriction on the use of the Site for commercial purposes, a vulnerability assessment was not conducted. However, if it is determined that a vulnerability assessment is warranted due to proposed modifications to the remedy, a vulnerability assessment will be performed during a periodic assessment, and the assessment will briefly summarizes the vulnerability of the site and/or engineering controls to severe storms/weather events and associated flooding.

4.2 Green Remediation Evaluation

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 of the SMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the Periodic Review Report (PRR).

Because the remedy at the Site does not involve an active remedial system or engineering controls and is only a restriction on the use of the Site for commercial purposes,

the remedy does not generate waste, use energy, create emissions, use water, or modify ecosystems. However, if it is determined that proposed modifications to the remedy are required, these elements will be evaluated as part of the proposed remedy modification evaluation.

5.0 REPORTING REQUIREMENTS

5.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix G. These forms are subject to NYSDEC revision.

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 5 and summarized in the Periodic Review Report.

Table 5: Schedule of Inspection Reports

Task/Report	Reporting Frequency*
Site-wide Inspection	Annually
Periodic Review Report	Every three years, or as otherwise determined by the Department

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

All 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;
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

In addition to above, if the excavation work plan is enacted, inspection reports will also include:

- 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, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations; and
- 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).

Non-routine 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.

5.2 Periodic Review Report

The Periodic Review Report will consist only of the certification as specified in Section 5.2.1 except in the event where there have been changes to the site or data gathered during the certifying period. Given such an event, the submittal of a comprehensive PR report will be necessary, as specified below.

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the No Further Action Letter is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted every three years to the Department or at another frequency as may be required by the Department. 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 A - 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 ICs required by the remedy for the site.
- Results of the required annual site inspections and severe condition inspections, if applicable.
- 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.
- A summary of any data and/or information generated during the reporting period, with comments and conclusions, if any.
- A site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the site-specific ROD;
  - Any new conclusions or observations regarding site contamination based on inspections or data generated;

- Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and
- The overall performance and effectiveness of the remedy.

5.2.1 Certification of Institutional Controls

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

"For each institutional 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;*
- *Use of the site is compliant with the environmental easement;*
- *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*
- *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] for the site."

The signed certification will be included in the Periodic Review Report if such report is required for the period. Otherwise, the Certification will be submitted as a stand-alone document.

The Periodic Review Report/Certification will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report/Certification may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

6.3 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 control, a Corrective Measures Work Plan will be submitted to the NYSDEC 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. Upon completion of the Corrective Measure, a signed certification form must be submitted to the Department.

7.0 REFERENCES

6NYCRR 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).

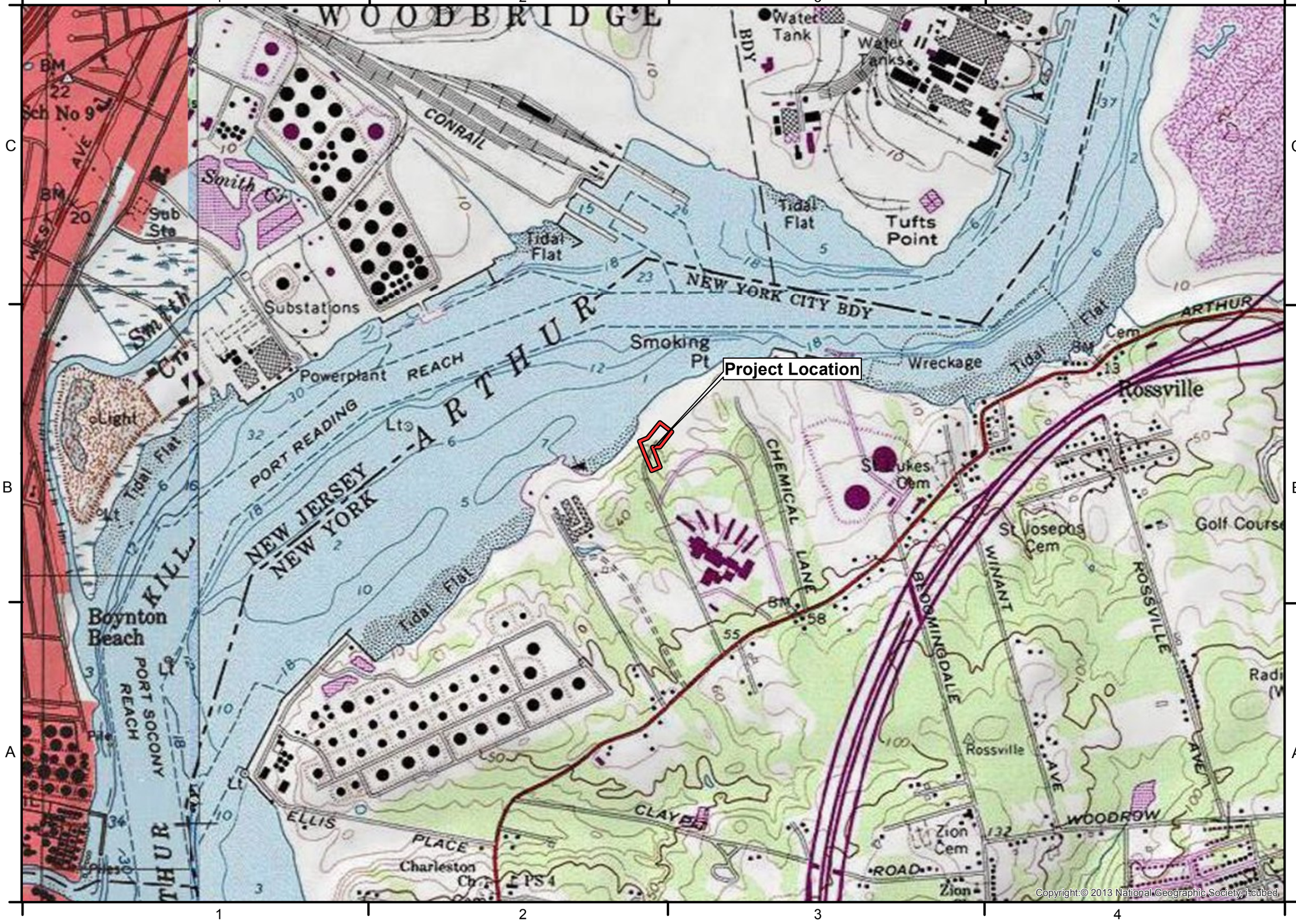
C&S Engineers. Subsurface Investigation Report - New Firing Range. May 2013.

C&S Engineers. Phase II Environmental Site Assessment. June 2013.

C&S Engineers. Site Characterization and Interim Remedial Measures Work Plan. June 2014.

C&S Engineers. Draft Site Characterization Report - Former Arthur Kill Correctional Facility Firing Ranges. November 2015.

FIGURES



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Legend

Site Area Boundary

N
W E
S

0 1,000 Feet
1 inch = 1,000 feet

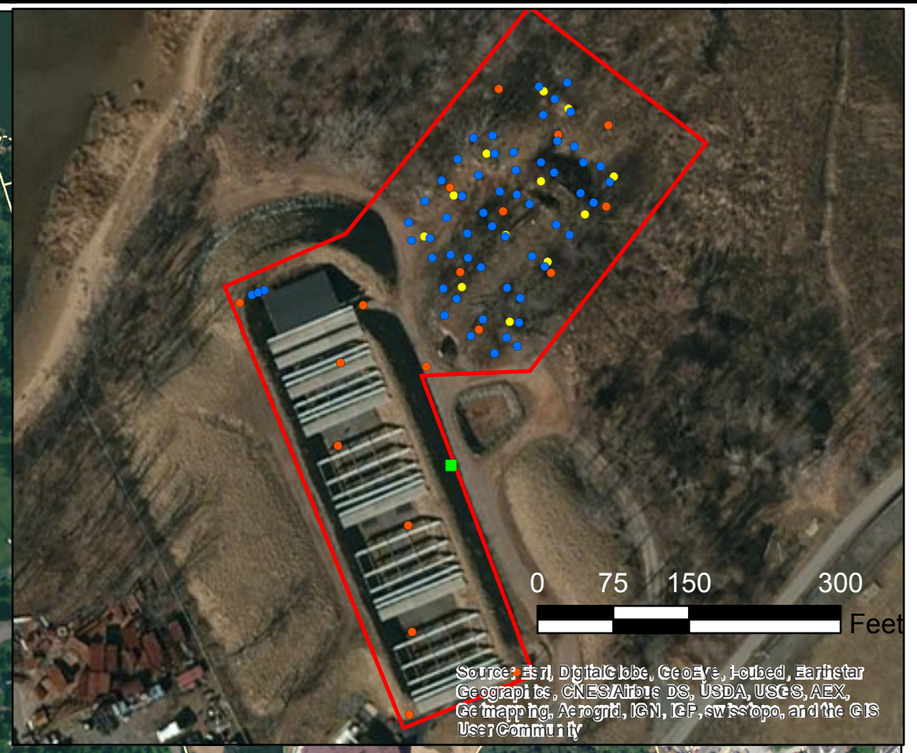
ARTHUR KILL CORRECTIONAL FACILITY
SITE MANAGEMENT PLAN
STATEN ISLAND, NEW YORK

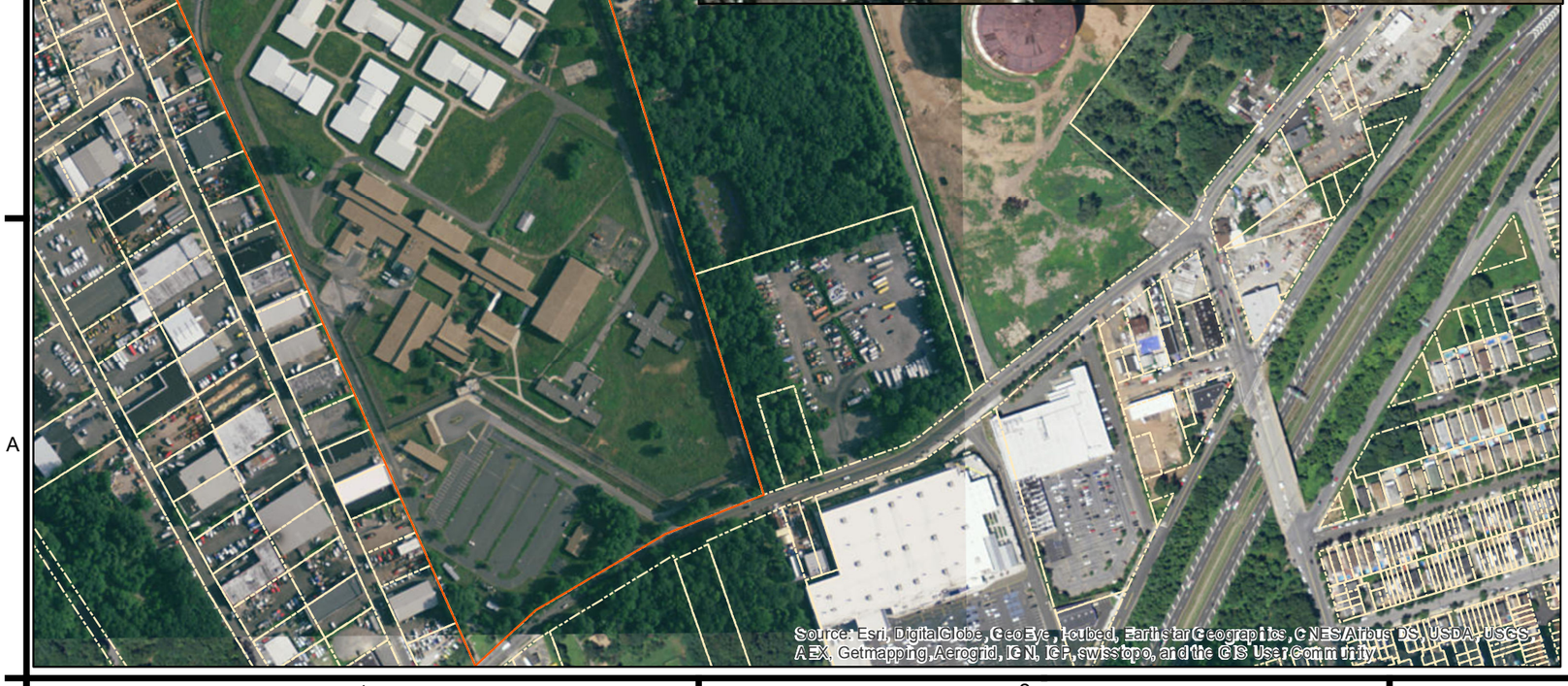
PROJECT NO:	190
DATE:	May 2014
SCALE:	AS SHOWN
DRAWN BY:	WNR
DESIGNED BY:	WNR
CHECKED BY:	RW

I:\Projects\190 - NYSDOCS\Mxd\190 - Arthur Kill Correctional Facility Firing Range\Design\GIS\Projects\Figure_1_R1.mxd

Site Location Map

Figure 1





Legend

- Site Boundary (IC Boundary)
- Tax Map Parcel
- IRM Confirmatory Sample Locations
- Site Characterization Sample Locations
- Transport Route Sample Location
- Surface Sampling Locations

Notes

1) Coordinate System: NAD 1983 StatePlane NY Long Island FIPS 3104
Projection: Lambert Conformal Conic
Datum: North American 1983
Units: Foot US

0 200 400 800
Feet

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ARTHUR KILL CORRECTIONAL FACILITY FIRING RANGES SITE MANAGEMENT PLAN

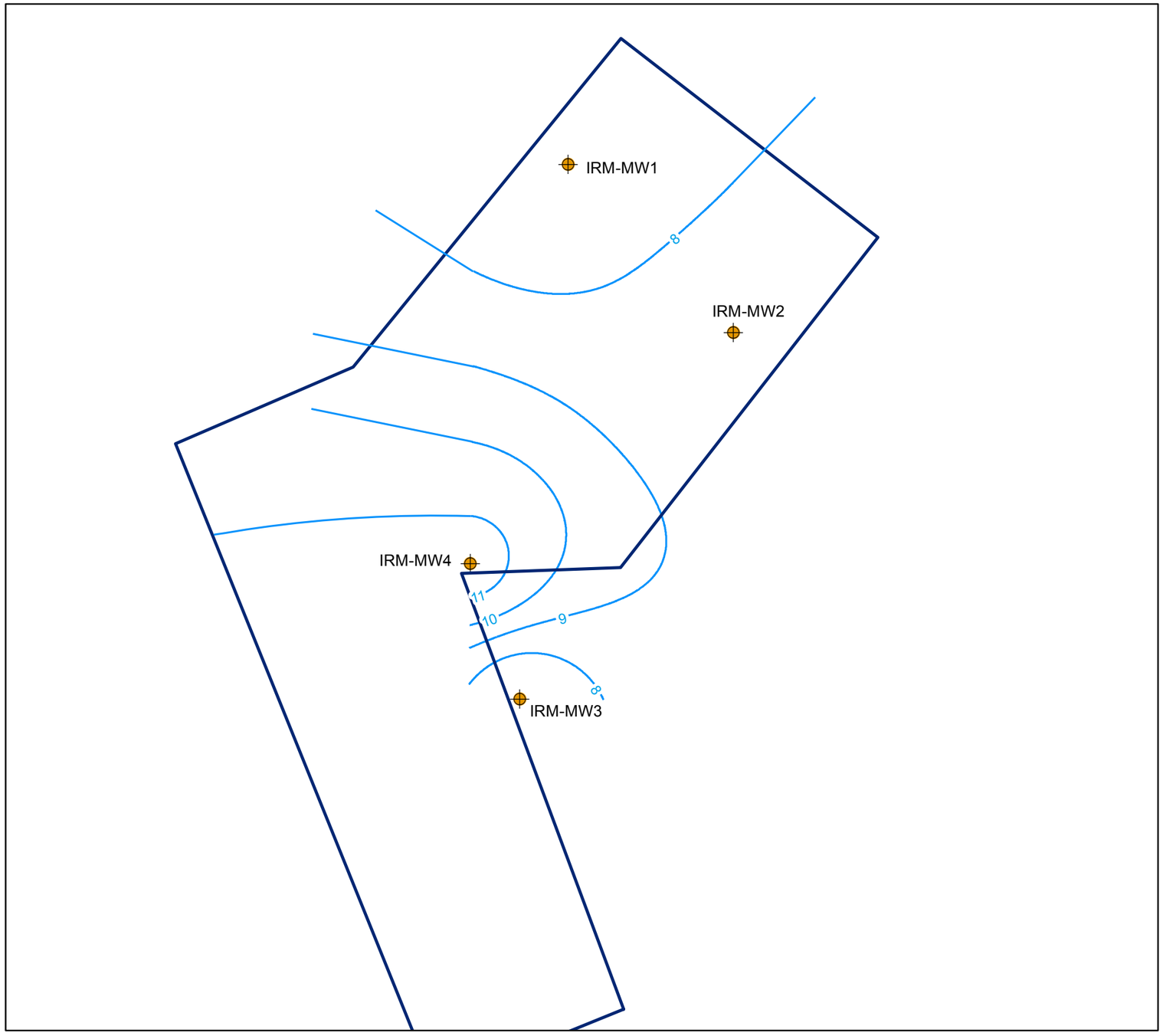
STATEN ISLAND, NEW YORK

MARK	DATE	DESCRIPTION
REVISIONS		

PROJECT NO:	190.461.010
DATE:	JANUARY 14 2016
DRAWN BY:	A. DEMARCHI
DESIGNED BY:	A. DEMARCHI
CHECKED BY:	D. RIKER

SITE LAYOUT MAP

FIGURE 2



Legend

- Site Boundary
- 10 Groundwater Elevation
- Groundwater Monitoring Well

Notes

1) Elevations shown in feet. Countours are an interpolation and should be considered as such.

2) Coordinate System: NAD 1983 StatePlane NY Long Island FIPS 3104
Projection: Lambert Conformal Conic
Datum: North American 1983
Units: Foot US

3) Survey information taken from "Topographical Survey and BCP Boundary Survey - Former Firing Range - Arthur Kill Correctional Facility" Parker Land Surveying, P.C. File No. 13-49. Dated July 31, 2015

0 30 60 120 Feet

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ARTHUR KILL CORRECTIONAL FACILITY FIRING RANGES SITE MANAGEMENT PLAN STATEN ISLAND, NEW YORK

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	190.461.010
DATE:	SEPTEMBER 30, 2015
DRAWN BY:	A. DEMARCHI
DESIGNED BY:	A. DEMARCHI
CHECKED BY:	D. RIKER

GROUNDWATER CONTOUR MAP

FIGURE 3

Path: F:\Project\190 - NYSOGS\190461010 - Arthur Kill Correctional Facility Firing Range\Design\GIS\Projects\SC_FigureX_gw_elevations.mxd

Legend

- Site Boundary (IC Boundary)
- Subsurface Soil Sample Location
- Surface Soil Sample Location

Notes

1) Only sample locations with remaining contamination are shown.

2) Coordinate System: NAD 1983 StatePlane NY Long Island FIPS 3104
Projection: Lambert Conformal Conic
Datum: North American 1983
Units: Foot US

0 37.5 75 150 Feet

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ARTHUR KILL CORRECTIONAL FACILITY FIRING RANGES SITE MANAGEMENT PLAN
STATEN ISLAND, NEW YORK

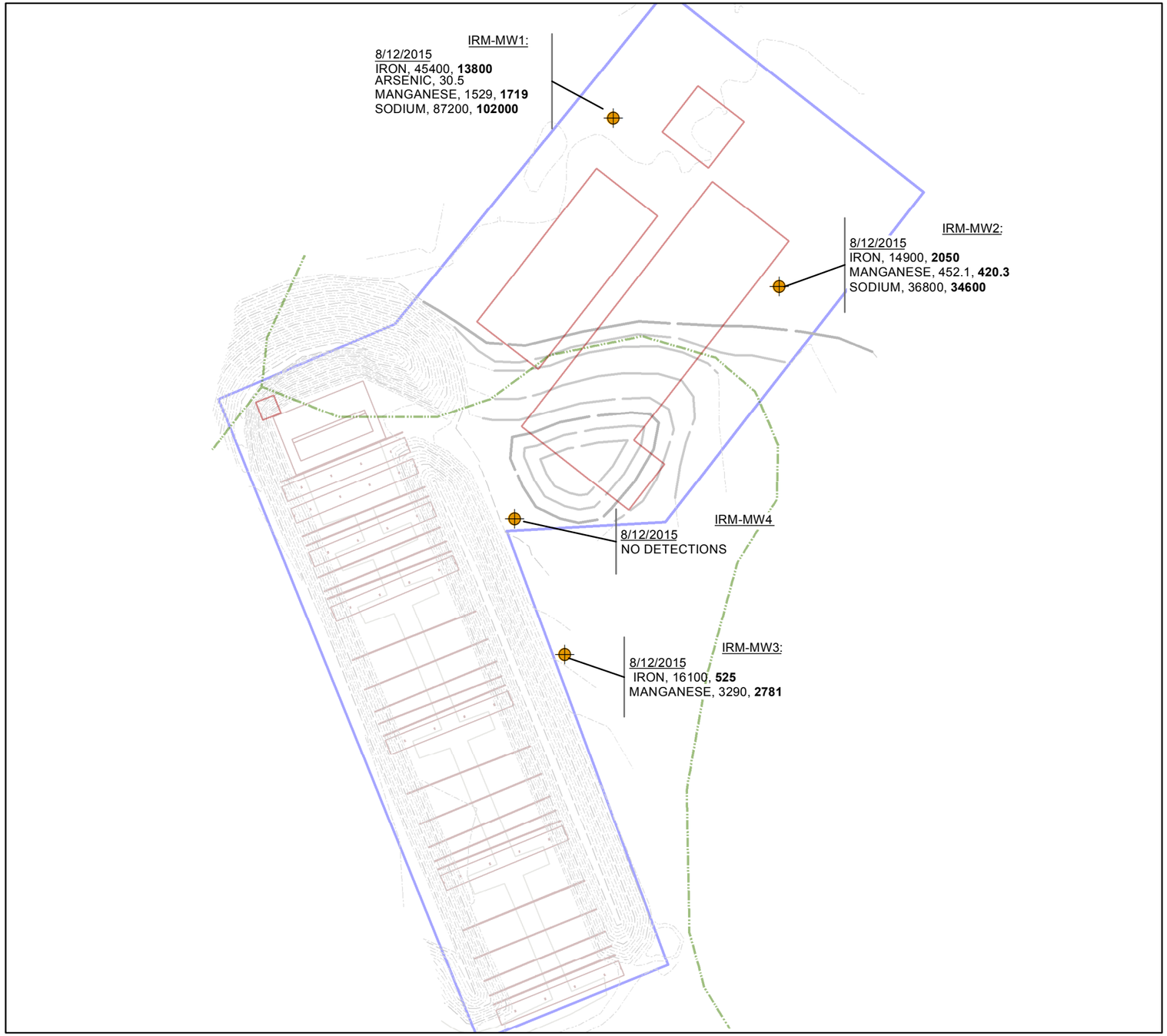
MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	190.461.010
DATE:	JANUARY 14 2016
DRAWN BY:	A. DEMARCHI
DESIGNED BY:	A. DEMARCHI
CHECKED BY:	D. RIKER

REMAINING SOIL EXCEEDANCES

FIGURE 4



Legend

- Site Boundary
- IRM Excavation Areas
- NWI Wetland Boundary
- Groundwater Sample

Sample ID
Sample Event Date
Analyte, Total Concentration, **Dissolved Concentration**

Notes

1) Only analytes detected at concentrations above NYS Ambient Water Quality Standards are shown.

2) Exceedance of dissolved concentrations included when applicable.

3) Coordinate System: NAD 1983 StatePlane NY Long Island FIPS 3104
Projection: Lambert Conformal Conic
Datum: North American 1983
Units: Foot US

0 30 60 120 Feet

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ARTHUR KILL CORRECTIONAL FACILITY FIRING RANGES SITE CHARACTERIZATION

STATEN ISLAND, NEW YORK

MARK	DATE	DESCRIPTION
		REVISIONS

PROJECT NO:	190.461.010
DATE:	SEPTEMBER 30, 2015
DRAWN BY:	A. DEMARCHI
DESIGNED BY:	A. DEMARCHI
CHECKED BY:	D. RIKER

REMAINING GROUNDWATER EXCEEDANCES

FIGURE 5

Path: F:\Project\190 - NYSOGS\190461010 - Arthur Kill Correctional Facility Firing Range\Design\GIS\Projects\SC_Figure_4_working.mxd

TABLES

TABLE 2 - ARTHUR KILL CORRECTIONAL FACILITY FIRING RANGES
GROUNDWATER ELEVATION MEASUREMENTS

Well	*Top of Casing Elevation (ft)*	*Depth to Water (ft)*	*Water Elevation (ft)*
IRM-MW1	11.29	4.13	7.16
IRM-MW2	14.92	6.54	8.38
IRM-MW3	20.63	9.28	11.35
IRM-MW4	17.78	10.42	7.36

TABLE 3
REMAINING SOIL EXCEEDANCES - SUBSURFACE

ARTHUR KILL CORRECTIONAL FACILITY

Sample Location / Sample Date	Unrestricted Use SCOs	Residential Use SCOs	Restricted Residential Use SCOs	Commercial Use SCOs	IRM MW-2 (S) 4/15/2015	IRM TP-1 4/15/2015	IRM TP-2 4/15/2015	IRM TP-4 4/15/2015	IRM TP-5 4/15/2015	IRM BH-3 4/15/2015
Semi-volatile Organic Compounds										
Benzo(a)anthracene	1	1	1	5.6				1.2		
Benzo(b)fluoranthene	1	1	1	5.6				1.4		
Chrysene	1	1	3.9	56				1.1		
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6				0.71		
Organochlorine Pesticides										
4,4'-DDE	0.0033	1.8	8.9	62	0.0144 J		0.00355 J	0.00397 J		0.00601 J
4,4'-DDD	0.0033	2.6	13	92	0.0959 J	0.00338 J				
4,4'-DDT	0.0033	1.7	7.9	47	2.19 J		0.0137 J	0.00524 J	0.00664 J	0.00352 J
Total Metals										
Arsenic	13	16	16	16	15					
Lead	63	400	400	1000		130 J			76 J	
Mercury	0.18	0.81	0.81	2.8					0.55 J	
Nickel	30	140	310	310					55	

TABLE 3 (Continued)
REMAINING SOIL EXCEEDANCES - SURFACE SOIL SAMPLES
ARTHUR KILL CORRECTIONAL FACILITY

Sample Location / Sample Date	Unrestricted Use SCOs	Residential Use SCOs	Restricted Residential Use SCOs	Commercial Use SCOs	IRM SS-2 4/15/2015	IRM SS-3 4/15/2015	IRM SS-4 4/15/2015	IRM SS-5 4/15/2015	TR2-SS 8/12/2015	A3-SS 10/15/2015	B2-SS 10/15/2015	B3-SS 10/15/2015	BLIND DUPLICATE (C1-SS) 10/15/2015	C3-SS 10/15/2015	D1-SS 10/15/2015	D2-SS 10/15/2015
Organochlorine Pesticides																
Dieldrin	0.005	0.039	0.2	1.4				0.00622 J								
4,4'-DDE	0.0033	1.8	8.9	62		0.00572 J				0.00767						
4,4'-DDD	0.0033	2.6	13	92				0.00444 J								
4,4'-DDT	0.0033	1.7	7.9	47	0.00642 J	0.00973 J	0.00826 J	0.00893 J		0.0312	0.00378	0.00798	0.00729		0.00509	0.00207 J
Polychlorinated Biphenyls																
Aroclor 1254	0.1	1	1	1						0.108						
PCBs, Total	0.1	1	1	1						0.108						
Total Metals																
Lead	63	400	400	1000	190 J		140 J	67 J	240	160	88	95	69	340	160	660
Mercury	0.18	0.81	0.81	2.8			0.2 J	0.73 J		0.19			0.2			
Nickel	30	140	310	310				50								
Zinc	109	2200	10000	10000			170 J			330						
Copper	50	270	270	270						77	84	59				

NOTES:
1.) Only analytes detected at concentrations above the Unrestricted Use SCOs are shown.
4.) All units are in mg/kg (ppm).
5.) Qualifers:
J -The analyte is present but the reported value is "estimated". The reported value may be associated with a higher value of uncertainty than is normally expected with an analytical method.
U - The analyte is not detected.
R - Unreliable result; data is rejected or unusable.

TABLE 3.1

REMAINING SOIL EXCEEDANCES - IRM SOIL SAMPLES

ARTHUR KILL CORRECTIONAL FACILITY

LOCATION	SAMPLING DATE	TOTAL LEAD (ppm)
E1B3	12/12/2014	150
E1B2	12/12/2014	190
E1WKX1	12/12/2014	95 J
E1WHI	12/18/2014	220
E1B4	12/18/2014	280
E1WUV	12/18/2014	74
E1WGH	12/18/2014	90
E1B9	12/22/2014	220 J
E1WST	12/22/2014	110
E1WEL	12/22/2014	74
E1B11	12/22/2014	140
E1WLR	12/22/2014	130
E1WRY	12/23/2014	120
E1B12	12/23/2014	130
E2WXD1	12/15/2014	400
E2WCD	12/15/2014	100
E2B1	12/15/2014	240 J
E2WVW	12/15/2014	340
E2WUV	12/16/2014	100
E2WAB	12/16/2014	250
E2WXD2+5	12/17/2014	120
E3WKM	12/10/2014	290
E3WMN	12/10/2014	250

Notes:

1.) Only analytes detected at concentrations above the Unrestricted Use SCOs are shown. Unrestricted Use SCO for lead is 63 ppm.

2.) All units are in mg/kg (ppm).

3. Qualifiers:

J -The analyte is present but the reported value is "estimated". The reported value may be associated with a higher value of uncertainty than is normally expected with an analytical method.

TABLE 4
REMAINING GROUNDWATER EXCEEDANCES
ARTHUR KILL CORRECTIONAL FACILITY SITE MANAGEMENT PLAN

Sample Location		IRM MW-1								IRM MW-2				IRM MW-3			
Sample Date		8/12/2015		8/12/2015		8/12/2015		8/12/2015		8/12/2015		8/12/2015		8/12/2015		8/12/2015	
Analysis	NY-AWQS[1]	Total		Duplicate-Total		Dissolved		Duplicate-Dissolved		Total		Dissolved		Total		Dissolved	
Metals																	
Arsenic	25	30.5	J														
Iron	300	45400	J	13300	J	13800	J	1210	J	14900	J	2050		16100	J	525	
Manganese	300	1529	J	429.6	J	1719	J	411.6	J	452.1	J	420.3		3290	J	2781	J
Sodium	20000	87200	J	34900	J	102000	J	35400	J	36800		34600	J				

Notes:
1.) Only analytes detected at concentrations higher than the NY-Ambient Water Quality Standards (NY-AWQS) are shown.
2.) All units are ug/l (ppb).
3.) Qualifers:
J -The analyte is present but the reported value is "estimated". The reported value may be associated with a higher value of uncertainty than is normally expected with an analytical method.

APPENDICES

APPENDIX A – ENVIRONMENTAL EASEMENT

Office of the
Richmond County Clerk
130 Stuyvesant Place
Staten Island, NY 10301

Hon. Stephen J. Fiala, County Clerk

ACS-00000000611638-00000000809378-012

Recording and Endorsement Cover Page

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PROPERTY DATA # OF BLOCKS 1 # OF LOTS 1

Block	Lot	Unit
7187	1	Entire Lot

PARTIES

GRANTOR	GRANTEE
STATEN ISLAND STAGES LLC 203 MESEROLE AVE BROOKLYN,NY 11222	PEOPLE OF THE STATE OF NEW YORK BY NYSDEC 625 BROADWAY ALBANY,NY 12233

SUPPORTING DOCUMENTS

RPT
TP-584

PAYMENT DETAIL

Make Checks Payable to:

Total Payments For This Document: .00

FEES PAID

NO FEE CPLR 8017(a) CN

EXAM AG DATE JUL 16 2018

RECORDED IN RICHMOND COUNTY

JUL 18 2018

COUNTY CLERK

LAND DOC# 706515
23Z-EASEMENT
RETT: 9415 $.00
RPT: 9415 $.00
07/18/2018 12:21:55 P.M.
RECEIPT: 28919 FEE: $.00
RICHMOND COUNTY CLERK

County: Richmond Site No: 243039 Order on Consent Index : R2-0816-13-10

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 3rd day of May, 2018, between Owner(s) Staten Island Stages LLC, having an office at 633 Third Avenue, 37th Floor, New York, New York 10017, County of New York, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 2911 Arthur Kill Road in the City of New York, County of Richmond and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 7187 Lot 1, being a portion of the property conveyed to Grantor by deed dated August 7, 2017 and recorded in the Richmond County Clerk's Office as Land Document # 664383. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 1.840 +/- acres, and is hereinafter more fully described in the Land Title Survey dated July 31, 2013 and last revised August 25, 2015 prepared by Thomas Andrew Parker, L.L.S. of Parker Land Surveying, P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is

extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Order on Consent Index Number: R2-0816-13-10, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene 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;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining

contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) 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 this Environmental Easement.

B. The Controlled Property shall not be used for Residential or Restricted Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i) and (ii), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation

pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved b the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her 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

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: 243039
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

Remainder of Page Intentionally Left Blank

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Staten Island Stages LLC:

By: _____

Print Name: GINA ARGENTO

Title: MANAGING-MEMBER Date: 4/16/2018

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF Kings)

On the 16th day of April, in the year 20 18, before me, the undersigned, personally appeared Gina Argento, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____
Notary Public - State of New York

ANTHONY K.C. FONG
STATE OF NEW YORK
NOTARY PUBLIC
Qualified in Queens County
02FO6333574
MY COMMISSION EXPIRES 11/23/2019

County: Richmond Site No: 243039 Order on Consent Index : R2-0816-13-10

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: _____
Michael J. Ryan, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 3rd day of May, in the year 2018 before me, the undersigned, personally appeared Michael J. Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2018

County: Richmond Site No: 243039 Order on Consent Index : R2-0816-13-10

SCHEDULE "A" PROPERTY DESCRIPTION

ALL THAT TRACT OR PARCEL OF LAND SITUATE IN THE CITY OF NEW YORK, COUNTY OF RICHMOND AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

Beginning at a mag nail; said mag nail standing therein distant N18°30'25"W 51.42 feet from the northeasterly building corner of the Range Class Room Building; thence N22°03'28"W 356.99 feet to an iron rod; thence N67°01'01"E 98.71 feet to an iron rod; thence N39°07'11E 221.35 feet to an iron rod; thence S51°56'52"E 168.25 feet to an iron rod; thence S38°04'30"W 215.82 feet to a spike; thence S86°45'14"W 81.64 feet to an iron rod; thence S20°20'59"E 238.53 feet to an iron road; thence S68°01'23"W 104.93 feet to the point and place of beginning.

The above described premises containing 1.84± acres of land more or less.

Subject to any easements, covenants or restrictions of record.

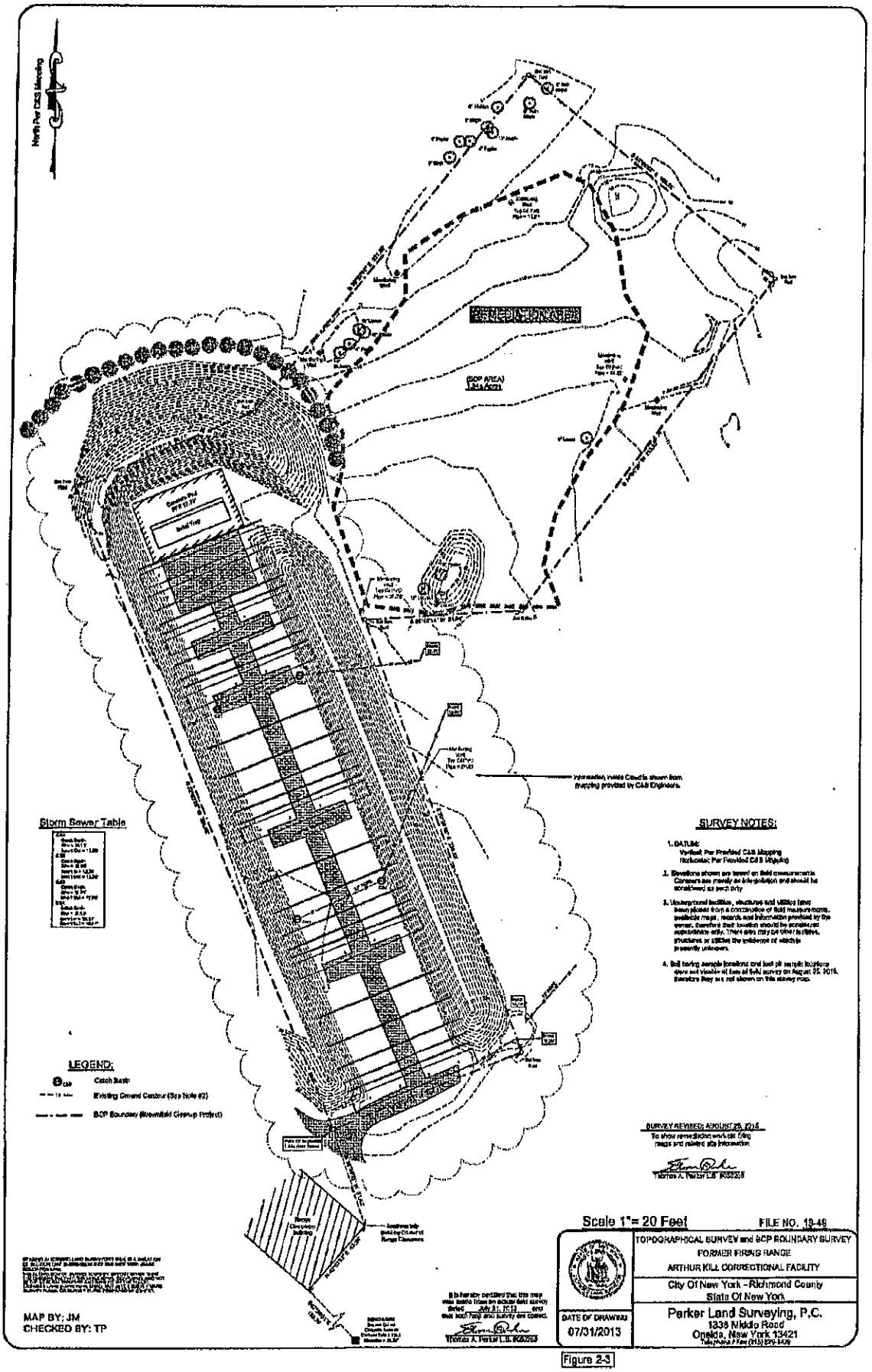
North Per CAS Mapping
(BCP AREA)
Storm Sewer Table
SURVEY NOTES:
1. DATUM:
Vertical: Per Provided CAS Mapping
Horizontal: Per Provided CAS Mapping
LEGEND:
Catch Basin
Existing Ground Contour (See Note #2)
BCP Boundary (Brownfield Cleanup Project)
Scale 1"= 20 Feet
FILE NO. 13-49
TOPOGRAPHICAL SURVEY and BCP BOUNDARY SURVEY
FORMER FIRING RANGE
ARTHUR KILL CORRECTIONAL FACILITY
City Of New York - Richmond County
State Of New York
Parker Land Surveying, P.C.
1338 Middle Road
Oriskia, New York 13421
DATE OF DRAWING
07/31/2013
MAP BY: JM
CHECKED BY: TP

Figure 2-3

PROPOSED DESCRIPTION
BCP AREA
ARTHURKILL CORRECTIONAL FACILITY

ALL THAT TRACT OR PARCEL OF LAND SITUATE IN THE CITY OF NEW YORK, COUNTY OF RICHMOND AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

Beginning at a mag nail; said mag nail standing therein distant N18°30'25"W 51.42 feet from the northeasterly building corner of the Range Class Room Building; thence N22°03'28"W 356.99 feet to an iron rod; thence N67°01'01"E 98.71 feet to an iron rod; thence N39°07'11"E 221.35 feet to an iron rod; thence S51°56'52"E 168.25 feet to an iron rod; thence S36°04'30"W 215.82 feet to a spike; thence S86°45'14"W 81.64 feet to an iron rod; thence S20°20'59"E 238.53 feet to an iron rod; thence S68°01'23"W 104.93 feet to the point and place of beginning.

The above described premises containing 1.84± acres of land more or less.

Subject to any easements, covenants or restrictions of record.

APPENDIX B – LIST OF SITE CONTACTS

Name	Phone/Email Address
Owner: Eric Greppo NYS Department of New York State Department of Corrections and Community Supervision	518.473.3582 eric.greppo@doccs.ny.gov
Qualified Environmental Professional: Daniel Riker, P.G. C&S Engineers	716.847.1630 driker@cscos.com
NYSDEC DER Project Manager: Jane O'Connell	718.482.4599 jane.oconnell@dec.ny.gov

APPENDIX C – SITE BORING LOGS AND MONITORING WELL CONSTRUCTION LOGS

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, New York 13212
Phone: (315) 455-2000
Fax: (315) 455-9667

Boring ID: IRM MW-1
Project: IRM & Site Characteristics - Arthur Kill Correctional
Client: NYS DOCS & OGS
Contractor: EMC, Inc.
Equipment: Track Mounted Geoprobe Rig

Page: 1 of 1
Date: 04/15/15

Depth (ft.)	Sample Number	Physical Description Lithology	Monitoring Well Construction	Remarks	Depth (ft.)
1				4” steel protective	1
				2” PVC Riser with 2.5’ of stickup	
2		water at 2’		Bentonite Seal 0 - 2.5’	2
		0 - 5’ - brown, black fine to medium SAND, wet		Sand Pack 2.5’ – 10’	
3				Well Screen Set 3 - 10’	3
4					4
5					5
6					6
7				Composite Soil sample collected from 0 - 5’ for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	7
8		5 - 10’ - black fine to medium SAND with some silt, wet			8
9				Water sample collected for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	9
10					10

Sampling Method: 5 ft. Macro-core

Notes: All readings on PID were 0.0 ppm

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, New York 13212
Phone: (315) 455-2000
Fax: (315) 455-9667

Boring ID: IRM MW-2
Project: IRM & Site Characteristics - Arthur Kill Correctional
Client: NYS DOCS & OGS
Contractor: EMC, Inc.
Equipment: Track Mounted Geoprobe Rig

Page: 1 of 1
Date: 04/15/15

Depth (ft.)	Sample Number	Physical Description Lithology	Monitoring Well Construction	Remarks	Depth (ft.)
1		water at 1’		4” steel protective	1
2		0 - 4’ - brown, black fine to medium SAND, some gravel, trace silt, wet		2” PVC Riser with 2.5’ of stickup Bentonite Seal 0 - 2.5’	2
3				Sand Pack 2.5’ – 10’ Well Screen Set 3 - 10’	3
4		4 - 5’ - black, SILT, trace sand, wet			4
5					5
6					6
7				Composite Soil sample collected from 0 - 5’ for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	7
8		5 - 10’ - black/grey fine to medium SAND with some silt, wet			8
9				Water sample collected for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	9
10					10

Sampling Method: 5 ft. Macro-core

Notes: All readings on PID were 0.0 ppm

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, New York 13212
Phone: (315) 455-2000
Fax: (315) 455-9667

Boring ID: IRM MW-3 **Page:** 1 of 1
Project: IRM & Site Characteristics - Arthur Kill Correctional **Date:** 04/15/15
Client: NYS DOCS & OGS
Contractor: EMC, Inc.
Equipment: Track Mounted Geoprobe Rig

Depth (ft.)	Sample Number	Physical Description Lithology	Monitoring Well Construction	Remarks	Depth (ft.)
2		0 - 3' - brown, SAND and GRAVEL, fill material, dry		4" steel protective 2" PVC Riser with 2.5' of stickup Bentonite Seal 0 - 3'	2
4		5 - 7' - brown, tan, fine to medium SAND, dry		Sand Pack 3' – 15' Well Screen Set 5 - 15'	4
6					6
		7 - 8' - grey CLAY, moist			
8		8 - 10' - tan, dense, CLAY			8
10					10
12		10 - 15' - grey CLAY, wet water at 12'		Composite Soil sample collected from 5 - 10' for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	12
14					14
		End boring @ 15'			
16					16
18				Water sample collected for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	18
20					20

Sampling Method: 5 ft. Macro-core

Notes: All readings on PID were 0.0 ppm

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, New York 13212
Phone: (315) 455-2000
Fax: (315) 455-9667

Boring ID: IRM MW-4
Project: IRM & Site Characteristics - Arthur Kill Correctional
Client: NYS DOCS & OGS
Contractor: EMC, Inc.
Equipment: Track Mounted Geoprobe Rig

Page: 1 of 1
Date: 04/15/15

Depth (ft.)	Sample Number	Physical Description Lithology	Monitoring Well Construction	Remarks	Depth (ft.)
2		0 - 2' - brown, SAND and GRAVEL, fill material, dry		4" steel protective 2" PVC Riser with 2.5' of stickup Bentonite Seal 0 - 3'	2
4		2 - 6' - brown, tan, SAND, some silt, dry		Sand Pack 3' – 15' Well Screen Set 5 - 15'	4
6		6 - 8' - tan, CLAY, trace sand, moist			6
8					8
10		water at 11' 8 - 15' - grey CLAY, trace sand, wet			10
12				Composite Soil sample collected from 5 - 10' for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	12
14					14
16		End boring @ 15'		Water sample collected for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	16
18					18
20					20

Sampling Method: 5 ft. Macro-core

Notes: All readings on PID were 0.0 ppm

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, New York 13212
Phone: (315) 455-2000
Fax: (315) 455-9667

Boring ID: IRM BH-1
Project: IRM & Site Characteristics - Arthur Kill Correctional
Client: NYS DOCS & OGS
Contractor: EMC, Inc.
Equipment: Track Mounted Geoprobe Rig

Date: 04/15/15

Depth (ft.)	Sample Number	Physical Description Lithology	Remarks	Depth (ft.)
1	1	0 - 5' - brown SAND with silt, some black organics, wet	Composite Soil sample collected from 0 - 5' for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	1
2				2
3				3
4				4
5				5
6		5 - 10' - black, brown, fine to medium SAND and GRAVEL, wet, trace silt		6
7				7
8				8
9				9
10				10

Sampling Method: 5 ft. Macro-core

Notes: All readings on PID were 0.0 ppm

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, New York 13212
Phone: (315) 455-2000
Fax: (315) 455-9667

Boring ID: IRM BH-2 **Page:** 1 of 1
Project: IRM & Site Characteristics - Arthur Kill Correctional **Date:** 04/15/15
Client: NYS DOCS & OGS
Contractor: EMC, Inc.
Equipment: Track Mounted Geoprobe Rig

Depth (ft.)	Sample Number	Physical Description Lithology	Remarks	Depth (ft.)
2		0 - 5' - black fine to medium SAND, some silt, some black organics, moist		2
4			Composite Soil sample collected from 0 - 5' for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	4
6		5 - 10' - black, brown, fine to medium SAND and GRAVEL, wet, trace silt		6
8				8
10				10
12		10 - 15' - brown to black, fine SAND and GRAVEL, wet, trace silt		12
14				14
16		End boring @ 15'		16
18				18
20				20

Sampling Method: 5 ft. Macro-core

Notes: All readings on PID were 0.0 ppm

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, New York 13212
Phone: (315) 455-2000
Fax: (315) 455-9667

Boring ID: IRM BH-3 **Page:** 1 of 1
Project: IRM & Site Characteristics - Arthur Kill Correctional **Date:** 04/15/15
Client: NYS DOCS & OGS
Contractor: EMC, Inc.
Equipment: Track Mounted Geoprobe Rig

Depth (ft.)	Sample Number	Physical Description Lithology	Remarks	Depth (ft.)
2		0 - 5' - tan, brown SAND, some silt, dry		2
4				4
6		5 - 10' - brown, fine to medium SAND, wet at 7'		6
8			Composite Soil sample collected from 5-10' for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	8
10				10
12		10 - 15' - brown fine to medium SAND, some silt, wet		12
14				14
		End boring @ 15'		
16				16
18				18
20				20

Sampling Method: 5 ft. Macro-core

Notes: All readings on PID were 0.0 ppm

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, New York 13212
Phone: (315) 455-2000
Fax: (315) 455-9667

Boring ID: IRM BH-4 **Page:** 1 of 1
Project: IRM & Site Characteristics - Arthur Kill Correctional **Date:** 04/15/15
Client: NYS DOCS & OGS
Contractor: EMC, Inc.
Equipment: Track Mounted Geoprobe Rig

Depth (ft.)	Sample Number	Physical Description Lithology	Remarks	Depth (ft.)
2		0 - 5' - tan CLAY, trace silt, dry		2
4				4
6		5 - 10' - grey CLAY, trace sand, dry		6
8			Composite Soil sample collected from 10-15' for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals	8
10				10
12		10 - 15' - grey CLAY, wet		12
14				14
		End boring @ 15'		
16				16
18				18
20				20

Sampling Method: 5 ft. Macro-core

Notes: All readings on PID were 0.0 ppm

499 Col Eileen Collins Blvd, Syracuse, New York 13212

(315) 455-2000 Fax: (315) 455-9667

TEST PIT LOGS

Test Pit No: IRM TP-1 **Date:** 4/15/15 **Page:** 1 of 1

Project: IRM & Site Characteristics - Arthur Kill Correctional

Client: NYS DOCS & OGS

Contractor: EMC, Inc.

Equipment: Cat 307B **Inspector:** W. Randall

	Strata Depth Change	Description of Materials	Remarks
	0 - 3	Brown to black, fine to medium SAND some fill material (brick, cinders)	PID - 0.0 on all depths
	3 - 5	Dark Brown fine to medium SAND, moist Groundwater seeping in at 3-ft below grade	Composite Sample collected for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals

Cobbles (2.5 to 10 inches diameter):
< 5%

Boulders (greater than 10 inches diameter):
none

499 Col Eileen Collins Blvd, Syracuse, New York 13212

(315) 455-2000 Fax: (315) 455-9667

TEST PIT LOGS

Test Pit No: IRM TP-2 **Date:** 4/15/15 **Page:** 1 of 1

Project: IRM & Site Characteristics - Arthur Kill Correctional

Client: NYS DOCS & OGS

Contractor: EMC, Inc.

Equipment: Cat 307B **Inspector:** W. Randall

	Strata Depth Change	Description of Materials	Remarks
	0 - 3	Black, fine to medium SAND some mixed fill (cobbles)	PID - 0.0 on all depths
	3 - 5	Dark Brown fine to medium SAND, organic odor, moist	
		Groundwater seeping in at 4-ft below grade	Composite Sample collected for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals

Cobbles (2.5 to 10 inches diameter):
< 5%

Boulders (greater than 10 inches diameter):
none

499 Col Eileen Collins Blvd, Syracuse, New York 13212

(315) 455-2000 Fax: (315) 455-9667

TEST PIT LOGS

Test Pit No: IRM TP-3 **Date:** 4/15/15 **Page:** 1 of 1

Project: IRM & Site Characteristics - Arthur Kill Correctional

Client: NYS DOCS & OGS

Contractor: EMC, Inc.

Equipment: Cat 307B **Inspector:** W. Randall

Scale in Feet	Strata Depth Change	Description of Materials	Remarks
	0 - 1	Brown, sandy topsoil	
	1 - 5	Tan, fine to medium SAND, hard, dry	PID - 0.0 on all depths
		No groundwater encountered	Composite Sample collected for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals

Cobbles (2.5 to 10 inches diameter):
< 5%

Boulders (greater than 10 inches diameter):
none

499 Col Eileen Collins Blvd, Syracuse, New York 13212

(315) 455-2000 Fax: (315) 455-9667

TEST PIT LOGS

Test Pit No: IRM TP-4 **Date:** 4/15/15 **Page:** 1 of 1

Project: IRM & Site Characteristics - Arthur Kill Correctional

Client: NYS DOCS & OGS

Contractor: EMC, Inc.

Equipment: Cat 307B **Inspector:** W. Randall

Scale in Feet	Strata Depth Change	Description of Materials	Remarks
	0 - 1	Brown, sandy topsoil	
	1 - 5	Tan, fine to medium SAND, hard, dry	PID - 0.0 on all depths
		No groundwater encountered	Composite Sample collected for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals

Cobbles (2.5 to 10 inches diameter):
< 5%

Boulders (greater than 10 inches diameter):
none

499 Col Eileen Collins Blvd, Syracuse, New York 13212

(315) 455-2000 Fax: (315) 455-9667

TEST PIT LOGS

Test Pit No: IRM TP-5 **Date:** 4/15/15 **Page:** 1 of 1

Project: IRM & Site Characteristics - Arthur Kill Correctional

Client: NYS DOCS & OGS

Contractor: EMC, Inc.

Equipment: Cat 307B **Inspector:** W. Randall

Scale in Feet	Strata Depth Change	Description of Materials	Remarks
	0 - 3.5	Tan, fine to medium SAND, hard, dry	PID - 0.0 on all depths
		No groundwater encountered	Composite Sample collected for TCL 8270, TCL VOCs, Pesticides, Herbicides, PCBs, and Metals

Cobbles (2.5 to 10 inches diameter):
< 5%

Boulders (greater than 10 inches diameter):
none

APPENDIX D – EXCAVATION WORK PLAN (EWP)

D-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table D-1 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 B.

Table D-1: Notifications*

Jane O'Connell	718.482.4599 jane.oconnell@dec.ny.gov
Kelly Lewandowski	518.402.9569 kelly.lewandowski@dec.ny.gov

* 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 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;

- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix F of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

D-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). 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 release letter.

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 D-6 of this Appendix.

D-3 SOIL STAGING METHODS

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.

D-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision 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.

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).

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.

D-5 MATERIALS TRANSPORT OFF-SITE

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 tight-fitting covers. 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 (see Figure D-1):

- Turn left out of Site onto Arthur Kill Road
- Turn right onto Bloomingdale Road
- Turn Right onto Veterans Road South
- Merge onto west Shore Expressway

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.

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.

D-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) 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. Unregulated off-site management of materials from this site will not occur without formal NYSDEC 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, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: 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, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

D-7 MATERIALS REUSE ON-SITE

Soil excavated at the Site will not be reused on-site. 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.

D-8 FLUIDS MANAGEMENT

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 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.

D-9 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional 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.

Material from industrial sites, spill sites, or 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 6NYCRR 375-6.7(d). 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 Appendix 5 of NYSDEC's DER-10 for Commercial Use sites. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. 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.

D-10 STORMWATER POLLUTION PREVENTION

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.

D-11 EXCAVATION CONTINGENCY PLAN

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.

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, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. 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.

D-12 COMMUNITY AIR MONITORING PLAN

During completion of ground intrusive activities, efforts will be taken to complete field work in a manner which will minimize the creation of airborne dust or particulates. Under dry conditions, work areas may be wetted to control dust. During periods of extreme wind or rain, intrusive field work may be halted until such time as the potential for creating

airborne dust or particulate matter is limited. Periodic monitoring following the guidelines of the NYSDOH's Generic Community Air Monitoring Plan (see Attachment 1A of the NYSDEC's DER-10) will be implemented during all non-intrusive environmental sampling activities, including surface soil and sediment sampling, and collection of groundwater samples from groundwater monitoring wells.

During completion of ground intrusive activities (soil borings and earthwork), a community air monitoring plan meeting the requirements of the NYSDOH's Generic Community Air Monitoring Plan (see Attachment 1A of the NYSDEC's DER-10) will be implemented for the duration of intrusive activities. These additional air monitoring activities will include establishment of background conditions, continuous monitoring for volatile organic compounds and/or particulates at the downwind work area (exclusion zone) perimeter, recording of monitoring data, and institution and documentation of Response Levels and appropriate actions in accordance with NYSDOH guidance..

The locations of air sampling stations will be based on generally prevailing wind conditions and 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.

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

D-13 ODOR CONTROL PLAN

Although not anticipated, this odor control plan is capable of controlling emissions of nuisance odors off-site. 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. 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.

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.

D-14 DUST CONTROL PLAN

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

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, non-vegetated 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.

Legend

TRUCK ROUTE

Notes

TRUCK ROUTE:
1. TURN LEFT OUT OF SITE ONTO ARTHUR KILL ROAD
2. TURN RIGHT ONTO BLOOMINGDALE ROAD
3. TURN RIGHT ONTO VETERANS ROAD SOUTH
4. MERGE ONTO WEST SHORE EXPRESSWAY

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N

ARTHUR KILL CORRECTIONAL
FACILITY FIRING RANGES
SITE MANAGEMENT PLAN
STATEN ISLAND, NEW YORK

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	190.461.010
DATE:	JANUARY 2015
DRAWN BY:	A. DEMARCHI
DESIGNED BY:	A. DEMARCHI
CHECKED BY:	D. RIKER

TRUCK ROUTE

FIGURE D-1

APPENDIX E – FIELD SAMPLING PLAN

The attached Sampling and Analysis Plan provides the procedures to be followed during future environmental sampling programs at the Site.

Sampling and Analysis Plan

for

Site Characterization and Interim Remedial Measures

Arthur Kill Correctional Facility
Firing Ranges

NYSDEC SITE # 243039

Prepared for:

New York State Department of Corrections and Community Supervision

and

New York State Office of General Services

Prepared by

C&S Engineers, Inc.
499 Colonel Eileen Collins Blvd.
Syracuse, New York 13212

January 2014 – Finalized June 2014

SAMPLING AND ANALYSIS PLAN

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

This Sampling and Analysis Plan is for the Arthur Kill Correctional Facility Project on Staten Island, Richmond County, New York. The project involves an Interim Remedial Measure (IRM) to remove lead contaminated debris and soil, and a post-IRM Site Characterization (SC) to further define contamination at the Site, and an Alternatives Analysis to determine if further actions are need to reduce the risk that the site contamination poses.

Note that this plan describes procedures for a variety of sampling situations. Not all of these situations may exist at the Arthur Kill Correctional Facility site. The Work Plan for the SC details the specific sampling and analysis for the Arthur Kill Correctional Facility project.

SECTION 2 QUALITY ASSURANCE PROJECT PLAN (QAPP)

2.1 Project Description

This Sampling and Analysis Plan includes identification of sampling locations and media, method of collection, handling, and preservation, and the protocol used for sample analysis. Environmental media to be sampled include soils and groundwater. The data will be utilized to form conclusions as to the presence, transport, and fate of site specific contaminants.

2.2 Project Organization and Responsibilities

The sampling and analysis plan will utilize the following project organization and the associated responsibilities:

Project Administration	Robert N. Duclos, P.E.
Project Management	Robert N. Duclos, P.E.
Quality Assurance/Quality Control	Don Anne´ (Alpha Geosciences)
Laboratory Coordinator	Wayne Randall
Field Investigations	Rory Woodmansee

2.3 Data Quality Objectives

Data Quality Objectives (DQOs) are statements which describe the desired quality of data necessary to meet the objectives of the sampling program. The DQOs for the Arthur Kill Correctional Facility site sampling program were formulated during the scoping effort and developed as part of this Sample and Analysis Plan. The general steps followed in preparation of the DQOs were as follows:

- *Identification of the media to be sampled* - Identifies the media being investigated (e.g., ground water, surface soil).
- *Identification of the data uses* - Identifies the intended use of the data according to the following:
  - Site Characterization - Data are used to determine the composition, nature, and extent of contamination.
  - Risk Assessment - Data are used to evaluate the actual or potential risks posed by contaminants determined to be present on-site. Particular attention is given to sampling at locations where human exposure is possible.
  - Health and Safety Plan (HSP) - Data are used to establish the level of protection needed for on-site workers during site characterization activities.
  - Monitoring - Data are used during the monitoring of the remedial action to access the effectiveness of such action.
  - PRP Enforcement - Data are used to help establish potentially responsible parties (PRP's).
  - Evaluation of Alternatives - Data are used to evaluate various proposed remedial technologies and assist in proper design of alternatives.
- *Identification of the data types* - Identifies what types of analyses are to be performed.
- *Sample Collected* - Describes the sample types to be collected.
  - Environmental - Refers to a specific media sampled such as water, soil, air, or biological.
  - Source - Refers to sampling an actual contamination source.
  - Grab - A discrete sample representative of a specific location.
  - Composite - A sample that represents a mixture of a number of grab samples that represents the average properties over the extent of areas sampled.

- Biased -Sampling that focuses on a specific area of expected contamination or uncontaminated area (background).

► *Identification of the data quality needs* - Identifies the analytical options available to support data collection activities and are identified as follows:

- Level I: *Field Screening* - portable type instruments which provide real-time data.
- Level II: *Field Analysis* - portable analytical instruments in an on-site lab or transported to the site.
- Level III: *Standard Analytical Protocols* - standard analytical protocols or without the NYSDEC Analytical Services Protocol (ASP) (2005) deliverables/reportables documentation.
- Level IV: *NYSDEC ASP Reportables/Deliverables* - rigorous QA/QC protocols and reportables/deliverables documentation; NYSDEC ASP (2005) Category B deliverables.
- Level V: *Non-Standard* - methods which have been modified to meet specific site study or remediation needs or by use of some other specialized analytical methods that cannot be obtained through standard or typical avenues of analytical support.

► *Identification of Data Quality Factors* - Describes factors which influence the quality or quantity of data to be collected. Primary contaminants and associated levels of concern are identified concerning Applicable or Relevant and Appropriate Requirements (ARARs) or potential risks. The required detection limit are also given or referenced.

► *Identification of QA/QC Samples* - Specifies additional samples to be collected to support Quality Assurance/Quality Control (QA/QC) procedures. Additional samples to be collected could include:

- *Matrix Spike/Matrix Spike Duplicates* - Matrix spike and matrix spike duplicate samples are collected as a duplicate sample to which the analytical laboratory will add known amounts of target analytes. These QA/QC samples are intended to assess the effectiveness of extraction and analytical procedures used by the laboratory.
- *Field Blanks* - Field (equipment) blanks are samples which are obtained by running analyte-free water through the sample collection equipment in a way that is identical to the sample collection procedures. Field blanks may be used during QA/QC procedures to evaluate if sampling equipment has contributed contaminants to the samples.

- *Trip Blanks* - Trip blanks are samples which are prepared prior to the sampling event in the same type of sample container and are kept with the collected samples throughout the sampling event unit analysis. Trip blank vials are not opened in the field and are analyzed for volatile organics only.

2.4 Sampling Procedures

All sampling objectives, locations, and procedures have been included as the Field Sampling Plan and described in Section 3.0 of this Sampling and Analysis Plan. Items including Field Measurement Techniques, General Field Decontamination, and Sample Management have also been included within the Field Sampling Plan.

2.5 Laboratory Certification and Coordination

The Environmental Laboratory Accreditation Protocol (ELAP) certification is a tier of accreditation issued by the New York State Department of Health (NYSDOH) within the Solid and Hazardous Waste category. Such laboratories have demonstrated that they meet the requirements of the NYSDEC Analytical Services Protocol. All chemical analyses for samples from the site will be completed by an ELAP laboratory capable of performing project specific analyses as indicated in this QAPP. The project Quality Assurance Officer (QAO) will also be responsible for all project related laboratory coordination.

2.6 Analytical Methodologies

Analysis of samples collected during the project will be consistent with the NYSDEC ASP 2005, Category B requirements. Sampling and analysis will be performed for the Superfund Target Compound List (TCL) parameters including volatiles, semivolatiles, PCBs/pesticides, and Target Analyte List (TAL) inorganics. The specific analyses will be conducted according to the following NYSDEC ASP 2005 methodologies:

Parameter Group	Analysis Method
Volatiles	ASP 05-1
Semivolatiles	ASP 05-2
PCBs/Pesticides	ASP 05-3
Metals	CLP M-series 200.7 (ICP Methodology) or
	CLP M-series (202.1 - 289.2) (AA Methodology)
Mercury	CLP M-245.1
Cyanide	CLP M-335.2

Trip blanks will accompany each shipment of aqueous samples for VOC analysis. Trip blanks are not necessary for soil samples. If several samples are collected for VOC analysis on any one day, all VOC samples will be packed in the same cooler with the trip blank. All trip blanks will be analyzed according to NYSDEC ASP (2005) protocol for volatile organics. All data will be presented in Category B reportables / deliverables format.

Duplicate samples will be obtained from groundwater or aqueous and soil samples (solids). A guideline of one matrix spike/matrix spike duplicate (MS/MSD) sample in twenty for each matrix will receive a duplicate sample. The ASP provides the following definitions for MS and MSD samples:

- Matrix spike - An aliquot of a sample (water or soil) spiked with known quantities of specific compounds (target analytes) and subjected to the entire analytical procedure in order to indicate the appropriateness of the method for the matrix by measuring recovery. The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.
- Matrix spike duplicate - A second aliquot of the same matrix as the Matrix Spike that is spiked with identical concentrations of target analytes as the Matrix Spike, in order to document the precision and bias of the method in a given sample matrix.

With the present sampling schedule and sample quantities, one set MS/MSD samples will be collected from a water sampling location and one set of MS/MSD samples will be collected from soil sampling locations.

2.7 Analytical Quality Control

Analytical quality control for this Project will be consistent with the methodology and quality assurance/quality control requirements in the NYSDEC ASP 2005. The following holding times calculated from the verified time of sample receipt (VTSR) at the laboratory will be required from the contracted analytical laboratory, regardless of sample matrix:

Parameter	Task	Holding Time
Volatiles	Analysis	7 days from VTSR
Semivolatiles	Extraction	5 days from VTSR
	Sample clean-up	5 days from VTSR
	Analysis	40 days from VTSR
Pesticides/PCBs	Extraction	5 days from VTSR
	Sample clean-up	5 days from VTSR
	Analysis	40 days from VTSR
Mercury	Analysis	26 days from VTSR
Cyanide	Analysis	12 days from VTSR
Metals	Analysis	180 days from VTSR

2.8 Reportables and Deliverables Documentation

The IRM and Site Characterization analytical data which will be subjected to data usability review will be presented in NYSDEC ASP 2005 Category B reportables/deliverables format and will also be submitted in the NYSDEC's required Electronic Data Deliverables (EDD) format. The SC Report will be a stand-alone document that will include the results and an interpretation of the SC sampling, as well as the summary data from the previous SC sampling activities.

2.9 Data Usability Summary Reports

Data Usability Summary Reports (DUSRs) will be prepared by a qualified third party data validator consistent with the NYSDEC's Guidance for the Development of Quality Assurance Plans and Data Usability Summary Reports as given in Appendix 2B of the draft DER-10. The main objective of the DUSR is to determine whether the data presented meets the project-specific needs for data quality and data use. Mr. Don Anne´ (Alpha Geosciences) will review all data submittals and prepare DUSRs for this project.

SECTION 3 FIELD SAMPLING PLAN

3.1 Sampling Objectives

Field sampling at the Arthur Kill Correctional Facility site will be designed to obtain representative samples of environmental media to assess whether the IRM remedial objectives have been achieved and the impact that the site may have upon human health and the environment. The field sampling plan will include media sampling for groundwater, surface soils, and subsurface soils in areas of potential environmental concern.

3.2 Sampling Locations

Surface and Subsurface Soil

The SC and IRM Work Plan provides proposed locations for both the IRM confirmation samples and the subsequent SC soil samples. Subsurface borings will entail the use of continuous sampling at each boring location. Borings will be advanced using a six-inch I.D. hollow-stem auger or direct push sampling equipment without the use of air or drilling fluids. Drilling cuttings, when generated, will be visually inspected and screened with a photoionization detector (PID) and will be left on the ground in the area of the boring. Continuous sampling will be conducted to define the unconsolidated geology prior to boring advancement. During the continuous sampling process, all soil samples will be field screened for the presence of volatile organic compounds using a PID. One or more soil samples from each boring will be collected for analysis. The sampling intervals will be determined in the field based on visual examination of the samples and the results of PID screening. In the absence of evidence of contamination, samples will be retrieved from just above the water table.

Groundwater

At any boring location scheduled for completion as a monitoring well, when the subsurface boring has attained an appropriate depth for placement of the well screening across the water table, monitoring wells will be installed. One sample of groundwater will be collected from each well.

3.3 Sampling Procedures

The following sections provide procedures for collecting a variety of samples, not all of which will be needed at this site.

3.3.1 Preparation for Sampling

The sample collection technique is of prime importance to assure the integrity of the collected sample. The following techniques include provisions so that:

- A representative sample is obtained;
- Contamination of the sample is minimized;
- The sample is properly preserved; and
- An acceptable Chain-of-Custody record is maintained.

The QA/QC Sampling Component of the Plan includes:

- Incorporation of accepted sampling techniques referenced in the sampling plan;
- Procedures for documenting any field actions contrary to the QA/QC Plan;
- Documentation of all preliminary activities such as equipment check-out, calibrations, and container storage and preparation;
- Documentation of field measurement quality control data (quality control procedures for such measurements shall be equivalent to corresponding QC procedures);
- Documentation of field activities;
- Documentation of post-field activities including sample shipment and receipt, field team debriefing, and equipment check-in;
- Generation of quality control samples including duplicate samples, field blanks, equipment blanks, and trip blanks; and
- The use of these samples in the context of data evaluation with details of the methods employed (including statistical methods) and of the criteria upon which the information generated will be judged.

The personnel responsible for collection of groundwater, soil, miscellaneous media, and IRM confirmation samples will be familiar with standard sampling procedures and follow the appropriate protocol. Field records will be maintained in bound notebooks with numbered pages to document daily instrument calibration, locations sampled, field observations, and weather conditions. Each page will be dated and signed by the sampler. Each notebook will be

numbered and a log of notebooks will be maintained by the project manager.

Prior to sampling, all equipment must be procured and accommodations for sample container delivery, and sample shipment must be made. The following is a list of general equipment that would be on hand for sampling events. Special equipment for each sampling event is presented in the section describing that specific sampling event.

General Field Sampling Equipment

- Field Data Sheets
- Chain-of-Custody forms
- Engineers tape and folding ruler with 0.01 foot intervals
- Field Record Sheets
- Nitrile gloves
- Face-safety shield
- Tyvek coveralls
- Respirators
- Photoionization detector
- Bio-degradable phosphate free detergent
- Coolers (with ice)
- 55 gallon drums
- Sample bottles
- Aluminum foil
- Duct and filament tape
- Tap water
- Distilled water
- Laboratory grade methanol and hexane
- 5 gallon wash buckets
- Decontamination cloths
- Large disposal containers
- Large plastic sheets

3.3.2 Groundwater Sample Collection

Groundwater samples will be collected following the USEPA's low-flow protocol as described in EQASOP-GW 001 (Revised January 19, 2010) . All sampling equipment will be properly decontaminated in the field. The following equipment will be available for sampling of monitoring wells in addition to the general sampling equipment list:

- Well Data Sheets
- Peristaltic Pump
- Electronic water level indicator
- Multi-meter with flow-through cell (pH, specific conductance, temperature, ORP, DO)
- Turbidity meter
- Graduated cylinder, stopwatch
- 5-gallon graduated bucket
- Silastic and Teflon-lined PVC tubing
- Sample preservatives
- Acid resistant gloves

The following activities will be completed before going into the field every day before the start of sampling:

1. Fill out appropriate section on Well Data Sheet for the wells to be sampled;
2. Obtain the sampling schedule for each well to be sampled;

3. Calibrate the Photoionization Detector (PID) with the calibration gas and water parameter meters per manufacturer's instructions;
4. Determine the amount of sampling to be done for the day and prepare the necessary number of coolers;
5. Each well to be sampled will have designated coolers containing the pre-labeled, certified clean, sample bottles. The groundwater samples will be placed in the cooler labeled for the well from which they were taken. The bottle shall be labeled with large distinguishable letters, so that the groundwater samples will be placed in the proper cooler; and
6. Select the appropriate sample containers for the day's sampling. The containers shall be pre-marked with a sample parameter and preservatives. Reusable glass bottles will have been cleaned and prepared at the laboratory. The containers for the various parameters to be analyzed from each well location will then be placed in a cooler.

The following steps describe the sample low-flow collection of groundwater:

1. Unlock and remove the well cap;
2. Test the air at the wellhead with the calibrated PID. If the gases from the well have caused the air in the breathing zone to read greater than 5 ppm, stop work and refer to the Health and Safety Plan. Record the reading on the Well Data Sheet;
3. Prior to sampling, the static water level and the depth-to-bottom within the well must be measured and the measurement recorded on the Well Data Sheet.
4. Attach an approximately one-foot length of silastic tubing to the peristaltic pump. Attach additional Teflon-lined PVC tubing to the silastic tubing so that the intake is at the approximate midpoint of the water column. New tubing will be used for each well.
5. Purge and sample the well. Purge rate will be measured and adjusted to provide minimal drawdown. Purge waters will be collected and containerized and handled consistent with protocols described in SC Work Plan Section 3.6.
6. Record the withdrawal rate, the groundwater indicator parameters, and the amount of water purged in the field logbook and on the Well Data Sheet. All parameters should be measured and recorded at maximum five minute intervals until all parameters stabilize as follows: turbidity and DO (10%); temperature and specific conductance

(3%); pH (0.1 units); ORP (10 millivolts).

7. Fill the appropriate sample bottles according to the sampling schedule for each well. While filling the sample bottles, record the well number, type, volume of container, and the preservatives used on the Ground Water Sampling Analyses form.
8. Commence sample collection with the following sample collection order: volatiles, semivolatiles, PCBs/pesticides, cyanide, mercury, and metals
9. The preservatives for the various sampling parameters were previously added to the clean sample bottles by the laboratory. Some parameters may require additional special handling.
    - Volatile organics analyses samples must be free of air bubbles. When a bubble-free sample has been obtained, it must be immediately chilled.
    - All samples collected for metals analysis will be preserved with nitric acid to a pH less than 2.
    - Field filtering of inorganics samples may be needed.
10. Collect the matrix spike duplicates and trip blanks. Take samples according to sampling schedule presented in the Work Plan. Duplicate samples will include the field splitting of at least one groundwater sample for each sampling visit. This may require the extraction of twice the amount of water needed for duplication purposes. The creation of trip/field blanks and duplicates shall be performed at least once with each field batch with a minimum of once every twenty samples.
11. Record all pertinent information in field logbook and on the Well Data Sheet (include color, odor, sediment content of sample, etc.). Any situations at the site that have the potential to interfere with the analytical results should also be recorded here.
12. Lock well, inspect well site, and note any maintenance required.

3.3.3 Soil Sampling

Soil samples will be collected from IRM excavations, and SC test trenches, surface soils, and soil borings. The use of disposable sampling equipment will eliminate the need for collection of field (equipment) blanks. Equipment blanks will be collected if re-usable sampling equipment is utilized. Retrieved soil samples will be placed directly into parameter specific glass containers. Each sample container will be appropriately labeled and transported to the contracted laboratory in appropriate coolers.

The following equipment will be required for the sampling of soil samples, in addition to the general sampling equipment list:

- disposable stainless steel spoons or hand trowels; and
- photoionization detector (PID).

The following activities will be completed prior to field sampling everyday:

- Fill out appropriate section on Soil Sample Sheet for the sites/trenches to be sampled;
- Determine the amount of sampling to be done for the day and prepare the necessary number of coolers;
- Select the appropriate sample bottles for the day's sampling. Soil samples will be collected within unpreserved glass, parameter specific, containers.

Sampling for matrix spike/matrix spike duplicates shall be performed at least once with each field batch with a minimum of one for each twenty samples.

3.3.3.1 IRM Confirmation Samples

IRM Soil Confirmation sampling locations (shown on Figure 4 of the Work Plan) are based on guidance from DER-10 Section 5.4(b)2.ii.5 to provide:

- One sample from the top of each excavation sidewall per 30 feet (maximum) of excavation perimeter; and
- One bottom sample for every 900 square feet (maximum) of bottom area.

Any confirmation sample analytical result for total lead that exceeds the 400 mg/kg cleanup objective will require additional excavation as directed by the Owner's Representative. Bottom areas will be excavated an additional six inches and re-sampled and sidewalls will be extended outward five feet along the entire perimeter section associated with the exceedence and re-sampled. All excavated areas will be isolated with high-visibility marking tape for protection from re-entry or from otherwise being cross-contaminated from adjacent areas not yet remediated. If such an area is re-entered or potentially cross-contaminated, the contractor is required to remove additional materials and/or re-sample that area at his own expense. This protection will be maintained while awaiting the confirmation sampling results and after achievement of the cleanup objective has been confirmed.

There will be further post-IRM sampling for total lead to verify that the remedial activities did not result in migration of lead-impacted materials and to confirm that areas adjacent to the remedial areas are not impacted by lead at levels exceeding the site SCO of 400 mg/kg. These sampling locations will be proposed by the remedial contractor and must be approved by both the Owner's Representative and the NYSDEC project manager and are now assumed to include, at a minimum:

- IRM materials storage (stockpiling) areas;
- IRM decontamination areas (personnel and truck); and
- IRM materials transport routes.

IRM confirmation soil samples will be collected using disposable spoons or hand trowels from the areas of excavation walls/floor. The use of disposable sampling equipment will eliminate the need for collection of field (equipment) blanks. Equipment blanks will be collected if re-usable sampling equipment is utilized. The retrieved soil sample will be placed directly into parameter specific glass containers. Each sample container will be appropriately labeled and transported to the contracted laboratory in appropriate coolers. The following equipment will be required for the sampling of soil samples, in addition to the general sampling equipment list:

- dedicated or disposable stainless steel spoons or hand trowels; and
- photoionization detector.

The following activities will be completed prior to field sampling everyday:

- Fill out appropriate section on Confirmation Soil Sample Sheet for the excavation wall or floor locations to be sampled;
- Determine the amount of sampling to be done for the day and prepare the necessary number of coolers;
- Select the appropriate sample bottles for the day's sampling. Soil samples will be collected within unpreserved glass, parameter specific, containers.

Duplicate samples shall be collected at least once with each field batch with a minimum of one for each twenty samples. The on-site NYSDEC representative will be allowed the opportunity to split any sample taken.

3.3.3.2 SC Test Trenches and Surface Soils

Test trench and surface soil samples will be collected using disposable spoons or hand trowels from the areas of excavation walls/floor. The use of disposable sampling equipment will eliminate the need for collection of field (equipment) blanks. Equipment blanks will be collected if re-usable sampling equipment is utilized. Samples will be physically examined following collection and the lithology and description of the sample will be recorded in the field book. Depending on sample homogeneity, one or more samples from each sampling location will be placed within polyethylene bags, sealed, and tested for the presence of volatile vapors using a PID. The retrieved soil sample will be placed directly into parameter specific glass containers. Each sample container will be appropriately labeled and transported to the contracted laboratory in appropriate coolers. The following equipment will be required for the sampling of soil samples, in addition to the general sampling equipment list:

- dedicated or disposable stainless steel spoons or hand trowels; and
- photoionization detector.

The following activities will be completed prior to field sampling everyday:

- Record in field book the specific locations to be sampled;
- Determine the amount of sampling to be done for the day and prepare the necessary number of coolers;
- Select the appropriate sample bottles for the day's sampling. Soil samples will be collected within unpreserved glass, parameter specific, containers.

Duplicate samples shall be collected at least once with each field batch with a minimum of one for each twenty samples. The on-site NYSDEC representative will be allowed the opportunity to split any sample taken. Before split samples are taken, the parameters for evaluating the split results and any corrective actions must be determined and agreed upon.

3.3.3.3 SC Soil Borings

All soil borings will be continuously sampled. Soil borings made using DPT will utilize standard five-foot disposable PVC sampling tubes. Soil borings made using HSA technology will utilize split spoon samplers that will require decontamination after each use using bio-degradable phosphate free detergent. Each sample will be physically examined following opening of the sampling apparatus and the volume, lithology, and description of the sample will be recorded in

the field book. Depending on sample homogeneity, one or more samples from each sampling tube will be placed within polyethylene bags, sealed, and tested for the presence of volatile vapors using a PID. Samples will then selected and containerized for laboratory analysis based on the presence of physical indicators or PID measurements indicative of potential contamination. If no such indicators are present, a sample from the intervals corresponding to the top of the water table will be submitted for laboratory analyses.

3.3.4 QA/QC Samples

Matrix Spike / Matrix Spike Duplicates

Additional samples from each of the following environmental sampling media will be collected as matrix spike/matrix spike duplicates:

Groundwater	(downgradient well, as determined from water level measurements/calculations)
Subsurface Soils	(specific/random soil boring, surface soil, or IRM excavation soils)

Trip Blanks

Separate trip blanks will be carried into the field on sampling days. The trip blank vials will be prepared by the contracted laboratory and handled in the field similar to the other sampling containers with the exception that the vials will not be opened.

3.3.5 Investigation-Derived Waste Samples

All investigation derived waste will be collected, containerized, and managed consistent with NYSDEC guidance provided in DER-10 Section 3.3 (e). Such wastes, when they are generated, shall be presumed to be contaminated and must be fully characterized for off-site disposal and disposed in accordance with applicable regulations unless they meet the specific guidelines from DER-10 for on-site placement (soils) or discharge (fluids),

Investigation-derived soils must be sampled to determine whether they are classified as solid or hazardous wastes. The waste soils must be securely stored on-site in accordance with NYSDEC waste management regulations or other provisions approved by DER. Further sampling may be necessary based on the requirements of the selected disposal facility. If sample results indicate

these soils are not solid or hazardous waste, they may be replaced within the location of origin if all applicable guidelines from DER-10 Section 3.3 (e) are met and the manner of replacement is approved by DER.

Fluids, including groundwater and decontamination fluids, will be containerized upon production and transported from the point of generation to a temporary on-site storage area, securely staged within secondary containment in labeled containers, and disposed off-site in accordance with all regulations unless all of the following criteria are met:

- There is no visual evidence of contamination, consisting of discoloration, sheens, free product or NAPL;
- There is no olfactory evidence of contamination; and
- Laboratory analysis of the groundwater samples confirms that there are no concentrations of contaminants above groundwater standards at levels of concern present in the monitoring wells.

If all of the preceding conditions are met, and with NYSDEC approval, the containerized water may be recharged to unpaved ground into the same groundwater unit, within or directly adjacent to the source area and in a manner which does not result in surface water runoff. If off-site disposal is needed, it will be accomplished within 90 days of the accumulation date.

3.4 Field Measurement Techniques

Water Level Measurement - Water elevations will be taken using an electronic water level indicator capable of 0.01 feet accuracy on all wells prior to purging and sampling. Additional measurements will be collected during and following sampling consistent with low-flow sampling methods. All measurements taken for the purpose of determining site groundwater flow characteristics will be collected and recorded on well data sheets within the shortest practical period and on no case greater than a 24-hour period to obtain consistent elevations. The procedure for measuring water levels in the monitoring wells is:

- Unlock and remove well cap;
- Test the atmosphere of the well with the calibrated PID. If the gases from the well have caused the air in the breathing zone to read greater than 5 ppm, stop work and refer to the Health and Safety Plan

- Measure water level to nearest 0.01 foot with a water level indicator (electronic).
- Water level indicators will be decontaminated before moving to next well. The tape and cable are decontaminated by washing in a bucket of distilled water-biodegradable phosphate free-detergent solution, followed by a rinse with distilled water.

Field Parameter Measurements – The field parameter multi-meter will be field calibrated daily, using manufacturer-specified methods and reference solutions. Sample aliquots for will be obtained directly from a sampling point in disposable beakers.

Photoionization Detector (PID) - The PID will be calibrated daily (and more often as required by the manufacturer's data) prior to use in the field, using calibration test gases.

3.5 General Decontamination

The following procedures will be performed for the decontamination of exploration equipment, sampling equipment, and personnel after each drilling/sampling event:

Drill rig, backhoe, and excavator - The drill rig, direct-push rig, backhoe, and/or excavator will be cleaned within the vehicle decontamination pad using a pressure washer prior to their entrance and exit of the site. Greases and oils will not be used on any down hole equipment during drilling or exploration activities. All excess decontamination waters will be assumed contaminated and collected and containerized for proper waste characterization and disposal per Section 3.3.5.

Exploration equipment - To avoid cross contamination, cleaning between sampling sites will be employed on backhoe arms, buckets, hollow stem augers, casing drill rods, down-hole tools, and appurtenant equipment. Larger equipment will be pressure washed and smaller equipment will be hand-washed using a distilled water-biodegradable phosphate free-detergent solution, followed by a rinse with distilled water.

Split spoon sampler - The split spoon sampler will be scrubbed, cleaned, and put through a series of rinses between each sampling event. A number of split spoon samplers will be used so that one can be utilized for sampling while the others are being cleaned.

Reusable equipment - The following steps will be employed to decontaminate reusable equipment:

- Rinse equipment of soil or foreign material with potable water;
- Immerse and scrub equipment with bio-degradable phosphate-free detergent and potable water;
- Immerse and scrub in a potable water rinse without detergent;
- Immerse and scrub in deionized/distilled water;
- Saturate by spraying or immersion in laboratory-grade hexane;
- Air dry and wrap cleaned equipment in foil to carry to next monitoring site to prevent contamination of equipment during transfer; and

The decontamination wash and rinse water will be collected and containerized in 55 gallon drums, stored on-site as investigation-derived waste, and properly characterized and disposed per Section 3.3.5.

Disposable equipment - The following steps will be employed to decontaminate disposable equipment:

- Rinse with potable water;
- Remove all standing liquid from the piece of equipment;
- Dispose of the equipment in a dedicated container for contaminated solids; and
- Place rinse water in 55 gallon drums and store on-site as investigation-derived waste.

Sample containers - upon filling and capping sample bottles, the outside of the bottle will be wiped off with a clean paper towel. These towels will be disposed of in a dedicated container for contaminated solids.

Personnel decontamination - The following procedures will be used to decontaminate sampling personnel.

- After each sampling event chemical resistant gloves will be disposed of in a dedicated container for contaminated solids;
- At the end of each sampling day, Tyvek™ coveralls will be disposed of in a dedicated container for contaminated solids;
- Boots will be rinsed off with water to remove mud, clay, or any other contaminants;
- Rinse waters to be containerized and handled as investigation derived waste per section 3.3.5.; and
- Personnel will be required to follow procedures outlined in the Health and Safety Plan.

3.6 Sample Management Plan

3.6.1 Sample Management

The Sample Management Plan provides procedures to document and track samples and results obtained during this work effort. A series of pre-printed forms with the appropriate information serves as a vehicle for documentation and tracking.

In order to accomplish this task, the documentation materials will include sample labels, sample characterization and Chain-of-Custody sheets, daily field reports, and a sample log.

Sample Label - A sample label will be completed for each sample obtained and will be affixed to the sample container. The label is configured in a way to address various types of mediums. Information on the label includes, at a minimum, client name, location, sample description, sample number, date, time, grab sample, composite sample, notes, and sampler's name.

Sample Characterization & Chain-of-Custody Sheet - All pertinent field information will be entered onto the sample characterization and chain-of-custody sheets including client name, sample ID, sample description, location of sample, sampling method, number of containers, container type, analysis required, and preservation. The monitoring well form has space allotted for entering information regarding the well including depth to water, well volume, sample pH, temperature, color, etc. The Chain-of-Custody section of the form will document the sample's pathway of sample shipment which will include names of persons delivering/receiving, dates,

and times. The reverse side of this form will be used by the laboratory to document analysis performed on the sample. Copies of the completed forms will be retained by the Engineer and the analytical laboratory. The original sample characterization and Chain-of-Custody sheets will be submitted in the Remedial Investigation report along with the laboratory results.

Daily Field Reports - Daily activities will be recorded on the Inspection Report form. The purpose of this form will be to summarize the work performed on the site each day. The completed forms will be submitted to the Project Manager on a daily basis for short term site activity and on a weekly basis for site activities of a longer duration.

Sample Log - The sample log will be utilized to track each individual sample obtained at the site. The upper portion, "Field Identification" will be completed the day the sample is taken. The form will accompany the sample characterization and Chain-of-Custody form to the laboratory. Personnel at the laboratory will complete the middle section of this form and return it to the Engineer, who will use the document to track incoming results. The bottom of the sheet has space allocated to enter "Recommended Actions" based on laboratory results.

3.6.2 Sample Designation

Each sample will have a unique sample code that will include, where appropriate, the sample media, and the sample location. The following codes will be used in the sample designation:

Sample Media	Code	Sample Location	Example
Groundwater	MW	Monitoring well	MW-1D, 2S, etc.
Soil	SL	Test trench, soil boring, surface soil	TT-1;SB-1; SS-1
Miscellaneous Media			
Liquid	IL	Pit/sump/drain/IDW	IL-1 (Sump #1)
Solid/Residue	IS	Pit/sump/drain/IDW	IS-1 (Pit #1)
IRM Confirmation Soils	E	Excavation-wall/floor	Area ID; wall/floor
Field Blank	-	All	FB1, FB2, etc.
Matrix Spike Duplicate	-	All	MSD1, MSD2, etc.
Trip Blanks	-	-	TB1, TB2, etc.

As an example of a sample designation, sample MW-3S represents a groundwater sample obtained from monitoring well MW-3S.

3.6.3 Sample Handling

Each collected sample will be dispensed into the appropriate sample containers for the type of analysis to be performed. Appropriate sample preservatives will be added to the sample containers by the contracted analytical laboratory prior to the delivery into the field, except in cases where the sample preservative must be added after sample collection. All samples that require cool storage will be immediately placed in coolers with appropriate packaging materials so as to protect the breakage of sample containers during shipment. The sample coolers will be filled with cubed ice (no "Blue Ice") prior to leaving the sample collection location. In the instance that a local analytical laboratory is contracted, the samples will be hand delivered to the laboratory each sampling day. The chain-of-custody forms will be signed by the laboratory personnel picking up the samples and placed within the coolers. In the instance that an analytical laboratory is contracted which is not based locally and a common carrier is used for sample shipment, the chain-of-custody forms will be signed by the sampler and the carrier personnel and placed inside of the coolers. Careful packaging techniques will be used to prevent sample containers from breakage during shipment. Materials such as cardboard, foam wrap, or Styrofoam may be used as packaging materials. All samples will be delivered to the contracted analytical laboratory on the day they were collected and will be received by the laboratory within 24 hours of sample collection. The samples will be collected with sufficient time allowed at the end of the day for the analytical laboratory to properly process the sample chain-of-custody form.

APPENDIX F – HEALTH AND SAFETY PLAN

The attached C&S Engineers' Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) will be used for future environmental sampling and intrusive activities performed by C&S. All other future environmental sampling and intrusive activities performed by others will need to follow a similar plan to 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. 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.

Health and Safety Plan

for

Arthur Kill Correctional Facility
Firing Ranges

Site No. 243039

Prepared for:

New York State Department of Corrections and Community Supervision
and
New York State Office of General Services

Prepared by

C&S Engineers, Inc.
141 Elm Street, Suite 100
Buffalo, New York 14203

January 2016

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SECTION 1 – GENERAL INFORMATION

The Health and Safety Plan (HASP) described in this document will address health and safety considerations for all those activities that personnel employed by C&S Engineers, Inc., may be engaged in during site investigation and remediation work at the Arthur Kill Correctional Facility Firing Ranges located on Staten Island, Richmond County, New York. (Site). Figure 1 shows the approximate location of the Site. This HASP will be implemented by the Health and Safety Officer (HSO) during site work.

Compliance with this HASP is required of all C&S personnel who enter this Site. The content of the HASP may change or undergo revision based upon additional information made available to the health, safety, and training (H&S) committee, monitoring results or changes in the technical scope of work. Any changes proposed must be reviewed by the H&S committee.

Responsibilities

Project Manager…….	Mark Colmerauer Phone: (716) 847-1630 Cell: (716) 570-3457
Site Health and Safety Officer……...	Cody Martin Phone: (716) 847-1630 Cell: (716) 864-3752
Emergency Coordinator…….	Daniel Riker Phone: (716) 847-1630 Cell: (716) 572-5312
Health and Safety Manager……	Daniel Riker Phone: (716) 847-1630 Cell: (716) 572-5312

Emergency Phone Numbers

Emergency Medical Service.....911

Police: New York City Police Department (NYPD).....911

Hospital: Staten Island University Hospital - South .....(718)226-2000

Fire: FDNY 911

National Response Center.....(800) 424-8802

Poison Control Center .....(800) 222-1222

Center for Disease Control.....(800) 311-3435
NYSDEC Region 2 (Long Island, New York) .....(718) 482-4900
C&S Engineers.....(716) 847-1630

SECTION 2 - HEALTH AND SAFETY PERSONNEL

2.0 Health and Safety Personnel Designations

The following information briefly describes the health and safety designations and general responsibilities for this Site.

2.1 Project Manager (PM)

The PM is responsible for the overall project including the implementation of the HASP. Specifically, this includes allocating adequate manpower, equipment, and time resources to conduct Site activities safely.

2.2 Health and Safety Manager

- Has the overall responsibility for coordinating and reporting all health and safety activities and the health and safety of Site Workers.
- Must have completed, at a minimum, the OSHA 30-Hour Construction Safety Training, and either the 24-Hour training course for the Occasional Hazardous Waste Site Worker or the 40-Hour training course for the Hazardous Waste Operations Worker that meets OHSA 29 CFR 1910.
- Must have completed the 8-Hour Site supervisor/manager's course for supervisors and managers having responsibilities for hazardous waste Site operations and management.
- Directs and coordinates health and safety monitoring activities.
- Ensures that field teams utilize proper personal protective equipment (PPE).
- Conducts initial on-site specific training prior to Site Workers commencing work.
- Conducts and documents daily and periodic safety briefings.
- Ensures that field team members comply with this HASP.

- Immediately notifies the Construction Manager (CM) Project Manager and Superintendent of all accident/incidents.

- Determines upgrading or downgrading of PPE based on Site conditions and/or real time monitoring results.

- Ensures that monitoring instruments are calibrated daily or as the manufacturer's instructions determine.

- Reports to the CM Project Manager and Superintendent to provide summaries of field operations and progress.

- Submits and maintains all documentation required in this HASP and any other pertinent health and safety documentation.

2.3 Health and Safety Officer (HSO)

- Must be designated to the Health and Safety Manager by each Subcontractor as a Competent Person having, at a minimum, the OSHA 30-Hour Construction Safety Training.

- Must schedule and attend a Pre-Construction Safety Meeting with the Health and Safety Manager to discuss the Subcontractor Safety Requirements and must attend the Weekly Subcontractor Coordination Meeting.

- Responsible for ensuring that their lower tier contractors comply with project safety requirements.

- Must make frequent and regular inspections of their work areas and activities and ensure hazards that are under their control are corrected immediately and all other hazards are reported to the Construction Manager's Project Manager and Health and Safety Manager.

- Must report all work related injuries, regardless of severity, to the Construction Manager's Project Manager and the Health and Safety Manager within 24 hours after they occur.

2.4 Emergency Coordinator

- The Emergency Coordinator or his on-site designee will, in concert with New York State Office of Parks, Recreation and Historic Preservation, will implement the emergency response procedures whenever conditions at the Site warrant such action.
- The Emergency Coordinator or his on-site designee will be responsible for assuring the evacuation, emergency treatment, emergency transport of C&S personnel as necessary, and notification of emergency response units (refer to phone listing in the beginning of this HASP) and the appropriate management staff.

2.5 Site Workers

- Report any unsafe or potentially hazardous conditions to the Health and Safety Manager.
- Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP.
- Comply with rules, regulations, and procedures as set forth in this HASP, including any revisions that are instituted.
- Prevent unauthorized personnel from entering work Site.

SECTION 3 - PERTINENT SITE INFORMATION

3.1 Site Location and General History

The 1.84-acre Site is located on Arthur Kill Boulevard in Staten Island, Richmond County, New York. The Site is bounded by the Arthur Kill to the north, the remainder of the 81-acre Arthur Kill Correction Facility to the south, wetlands to the east, and industrial parcels including an auto repair facility to the west. Further information concerning the Site is presented below.

Site Description

The Site is relatively flat with some minor topographic relief dipping towards the Arthur Kill. Features on the property include the New Firing Range and wetlands.

Site History and Suspect Recognized Environmental Conditions

The Arthur Kill Correctional Facility was purchased by NYSDOCCs on May 6, 1976 from the New York State Narcotic Addiction Control Commission (NYSNACC), which had occupied the Site since 1969. NYSDOCCS operated two firing ranges on the Site. The Old Firing Range was reputedly first used in 1979 by corrections officers and by other agencies for the practice of pistol and shotgun marksmanship. The Old Firing Range remained in use until approximately 2005 when the New Firing Range was constructed immediately to the west. The Old Firing Range was abandoned at that time and the New Firing Range, which accommodates rifles as well as pistols and shotguns, was used from that time until the Arthur Kill Correctional Facility was closed in 2010.

A 2013 subsurface investigation was conducted to provide additional delineation of lead impacts in shallow soils. The sampling program included soils collected from 32 locations as well as non-soil materials such as rubber target media and wood in timbers and trees for disposal characterization purposes.

To address lead in the site soils in the firing ranges, Interim Remedial Measures (IRMs) were completed in 2014 and 2015. The IRMs for the Site consisted of the clearing of vegetation in the remediation areas and the excavation of soil to depths of six to 12 inches in the Former Firing Range and a small portion of the New Firing Range. The bullet-containing rubber material in the bullet trap of the New Firing Range was also removed. Confirmatory sampling indicates that the IRMs were effective in remediating the Site's soil. Following implementation of the IRMs, lead concentrations in remaining soils at the Site were under the Residential Use SCO, which was used as the guidance value as per the NYSDEC approved IRM/SC Work Plan.

Following the IRMs, a Site Characterization was completed in 2015 to determine if contamination remains at the Site following the IRM and, if present, to identify the nature and extent of that contamination. The Site Characterization consisted of the collection and analysis of surface soil samples, subsurface soil samples, and groundwater samples. The results of the Site Characterization demonstrated that the IRMs removed the vast majority of lead-impacted soil across the Site, although some slightly elevated concentrations were identified in a few locations. Additional analytes such as pesticides, SVOCs, and other metals were also detected at slightly

elevated concentrations in select soil locations. These results did not exceed the Commercial Use SCOs, suggesting that a deed restriction may be a useful tool in limited future development of the Site to uses that preclude residential development. Groundwater quality was shown to exhibit no impacts from the recently removed lead contaminants.

Exposure pathway concerns with these contaminants are generally through skin absorption, ingestion and inhalation of airborne dust particles. Following guidelines described in this HASP will reduce exposure.

SECTION 4 - HAZARD ASSESSMENT AND HAZARD COMMUNICATION

Hazards to workers during a site work include typical construction-related hazards such as slip-trip-fall, equipment malfunction, faulty electrical grounding, and heat/cold/excessive noise exposure. In addition to those typical construction-related hazards, there is also the potential for chemical exposures associated with environmental conditions. The most likely routes of chemical exposure during site work tasks include skin adsorption and inhalation of airborne dust particles.

It is difficult to draw a correlation between the concentrations of contaminants found in one media and the potential for exposure to these contaminants to site workers. However, their potential presence indicates that the potential for exposure to these compounds exist, and the requirements for protective measures and monitoring of exposure is based on this potential.

SECTION 5 - TRAINING

5.1 Site-specific Training

Training will be provided that specifically addresses the activities, procedures, monitoring, and equipment for the Site operations prior to going on site. Training will include familiarization with Site and facility layout, known and potential hazards, and emergency services at the Site, and details all provisions contained within this HASP. This training will also allow Site Workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

5.2 Safety Briefings

C&S project personnel will be given briefings by the HSO on a daily or as needed basis to further assist Site Workers in conducting their activities safely. Pertinent information will be provided when new operations are to be conducted. Changes in work practices must be implemented due to new information made available, or if Site or environmental conditions change. Briefings will also be given to facilitate conformance with prescribed safety practices. When conformance with these practices is not occurring or if deficiencies are identified during safety audits, the project manager will be notified.

SECTION 6 - ZONES

Four types of Site activity zones are identified for the Brownfield investigation activities, including the Exclusion Zone, Contamination Reduction Zone, Remediation Zone and the Support Zone. Prior to commencement of field work a further definition of where these zones will be set up will be established.

6.1 Exclusion Zone

The area where the unexpected condition is discovered would be considered the Exclusion Zone (EZ). All excavation and handling of contaminated materials generated as a result of the discovery of an unexpected condition would take place within the EZ. This zone will be clearly delineated by hay bales, jersey barriers, and/or similar methods. Safety tape may be used as secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The Site Safety Manager/Director may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Site Workers will not be allowed in the EZ without:

- A buddy (co-worker);
- Appropriate PPE in accordance with OSHA regulations;
- Medical authorization; and
- Training certification in accordance with 29 CFR 1910.120.

6.2 Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) will be established between the EZ and the property limits. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of Site equipment. The CRZ will be used for general Site entry and egress, in addition to access for heavy equipment and emergency support services. Site Workers will not be allowed in the CRZ without:

- A buddy (co-worker);
- Appropriate PPE in accordance with OSHA regulations;
- Medical authorization; and
- Training certification in accordance with 29 CFR 1910.120.

In addition, the CRZ will include a Site Worker Cleaning Area that will include a field wash station for Site Workers, equipment, and PPE to allow Site Workers to wash their hands, arms, neck, and face after exiting areas of grossly contaminated soil or hazardous materials. All Site Workers will be required to pass through the Site Worker Cleaning Area and wash their hands and remove any loose fill and soils from their clothing and boots prior to exiting the CRZ.

6.3 Remediation Zone

A Remediated Zone (RZ) will be established in portions of the Site where the remediation has been completed and only general construction work will be performed. Setup of the RZ will consist of implementing several measures designed to reduce the risk of workers' exposure and prevent non-trained workers from entering the non-remediated zone. Non-trained workers will work only in areas where the potential for exposure has been minimized by removal of all hazardous materials. The remediated zone will then be separated from the non-remediated zone by installing and maintaining temporary plywood or other construction fences along the boundary between the two zones. If potentially impacted material is uncovered in the RZ, all non-trained workers will be removed and the Site Safety Manager/Director will assess the potential risks. If, at any other time, the risk of exposure increases while non-trained workers are present in the RZ, the non-trained workers will be removed. At all times, when non- trained workers are present in the RZ, air

monitoring for the presence of VOCs will be conducted in the RZ, as well as at the fence line of the non-remediated zone.

6.4 Support Zone

The Support Zone (SZ) will be an uncontaminated area that will be the field support area for the Site operations. The SZ will contain the temporary project trailers and provide for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated equipment or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples. Meteorological conditions will be observed and noted from this zone, as well as those factors pertinent to heat and cold.

SECTION 7 - PERSONAL PROTECTIVE EQUIPMENT

7.1 General

The level of protection to be worn by field personnel will be defined and controlled by the HSO. Depending upon the type and levels of material present or anticipated at the site, varying degrees of protective equipment will be needed. If the possible hazards are unknown, a reasonable level of protection will be taken until sampling and monitoring results can ascertain potential risks. The levels of protection listed below are based on USEPA Guidelines. A list of the appropriate clothing for each level is also provided.

Level A protection must be worn when a reasonable determination has been made that the highest available level of respiratory, skin, eye, and mucous membrane protection is needed. It should be noted that while Level A provides maximum available protection, it does not protect against all possible hazards. Consideration of the heat stress that can arise from wearing Level A protection should also enter into the decision making process. Level A protection includes:

- Open circuit, pressure-demand self-contained breathing apparatus (SCBA)
- Totally encapsulated chemical resistant suit
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Boots, chemical protective

Level B protection must be used when the highest level of respiratory protection is needed, but hazardous material exposure to the few unprotected areas of the body (e.g., the back of the neck) is unlikely. Level B protection includes:

- Open circuit, pressure-demand SCBA or pressure airline with escape air bottle
- Chemical protective clothing: Overalls and long sleeved jacket; disposal chemical resistant coveralls; coveralls; one or two piece chemical splash suit with hood
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Boots, chemical protective

Level C must be used when the required level of respiratory protection is known, or reasonably assumed to be, not greater than the level of protection afforded by air purifying respirators; and hazardous materials exposure to the few unprotected areas of the body (e.g.., the back of the neck) is unlikely. Level C protection includes:

- Full or half face air-purifying respirator
- Chemical protective clothing: Overalls and long-sleeve jacket; disposable chemical resistant coveralls; coveralls; one or two piece chemical splash suit
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Boots, chemical protective

Level D is the basic work uniform. It cannot be worn on any site where respiratory or skin hazards exist. Level D protection includes:

- Safety boots/shoes
- Safety glasses
- Hard hat with optional face shield

Note that the use of SCBA and airline equipment is contingent upon the user receiving special training in the proper use and maintenance of such equipment.

7.2 Personal Protective Equipment – Site Specific

Level D with some modification will be required when working in the work zone on this Site. In addition to the basic work uniform specified by Level D protection, Nitrile gloves will be required

when contact with soil or ground water is likely. Hearing protection will be worn when power equipment is used to perform subsurface investigation work. An upgrade to a higher level (Level C) of protection may occur if determined necessary by the HSO.

SECTION 8 - MONITORING PROCEDURES

8.1 Monitoring During Site Operations

All Site environmental monitoring should be accompanied by periodic meteorological monitoring of appropriate climatic conditions.

8.1.1 Drilling Operations (Monitoring Well Installation and Subsurface Borings) and Test Pit Excavations

Monitoring will be performed by the HSO or drilling observer during the conduct of work. A photoionization detector (PID) equipped with a 10.0 eV lamp will be utilized to monitor for the presence of volatile organic vapors within the breathing zone, the borehole, and subsurface samples upon their retrieval. Drill cuttings and excavation spoils will also be monitored by use of the PID. The PID will be field checked for calibration accuracy three times per day (morning, lunch, and end of day. If subsurface conditions warrant, a combustible gas indicator (CGI) with oxygen alarm may also be used to monitor the borehole for the presence of combustible gases. Similar monitoring of fluids produced during well development will also be conducted.

8.1.2 Interim Remedial Measures

If future Interim Remedial Measures (IRM) occurs, monitoring will be performed during excavation and sampling operations when C&S personnel are within the work zone. Although historical information previously obtained at the Site indicates low level of volatile organic vapors and compounds, a photoionization detector (PID) will be used during subsurface activities. If an IRM is performed, the, the remedial contractor will be required to employ dust control practices during work.

8.2 Action Levels

If readings on the PID exceed 10 ppm for more than fifteen minutes consecutively, then personal protective equipment should be upgraded to Level C. The air purifying respirator used with Level C protective equipment must be equipped with organic vapor cartridges. If readings on the explosive gas meter are within a range of 10%-25% of the LEL then continuous monitoring will

be implemented. Readings above 25% of the LEL indicate the potential for an explosive condition. Sources of ignition should be removed and the Site should be evacuated.

8.3 Personal Monitoring Procedures

Personal monitoring shall be performed as a contingency measure in the event that VOC concentrations are consistently above the 10 ppm action level as detected by the PID. If the concentration of VOCs is above this action level, then amendments to the HASP must be made before work can continue at the Site.

SECTION 9 - COMMUNICATIONS

A phone will be located on Site to be utilized by personnel conducting investigation and IRM efforts. Cell phones will be the primary means of communicating with emergency support services/facilities.

SECTION 10 - SAFETY CONSIDERATIONS FOR SITE OPERATIONS

10.1 General

Standard safe work practices that will be followed include:

- Do not climb over/under drums, or other obstacles.
- Do not enter the work zone alone.
- Practice contamination avoidance, on and off-site.
- Plan activities ahead of time, use caution when conducting concurrently running activities.
- No eating, drinking, chewing or smoking is permitted in work zones.
- Due to the unknown nature of waste placement at the Site, extreme caution should be practiced during excavation activities.
- Apply immediate first aid to any and all cuts, scratches, abrasions, etc.
- Be alert to your own physical condition. Watch your buddy for signs of fatigue, exposure, etc.
- A work/rest regimen will be initiated when ambient temperatures and protective clothing create a potential heat stress situation.
- No work will be conducted without adequate natural light or without appropriate supervision.
- Task safety briefings will be held prior to onset of task work.

- Ignition of flammable liquids within or through improvised heating devices (barrels, etc.) or space heaters is forbidden.
- Entry into areas of spaces where toxic or explosive concentrations of gases or dust may exist without proper equipment is prohibited.
- Any injury or unusual health effect must be reported to the Site health and safety officer.
- Prevent splashing or spilling of potentially contaminated materials.
- Use of contact lenses is prohibited while on site.
- Beards and other facial hair that would impair the effectiveness of respiratory protection are prohibited if respiratory protection is necessary.
- Field crew members should be familiar with the physical characteristics of investigations, including:
  - Wind direction in relation to potential sources
  - Accessibility to co-workers, equipment, and vehicles
  - Communication
  - Hot zones (areas of known or suspected contamination)
  - Site access
  - Nearest water sources
- The number of personnel and equipment in potentially contaminated areas should be minimized consistent with site operations.

10.2 Field Operations

10.2.1 Intrusive Operations

The HSO or designee will be present on-site during all intrusive work, e.g., drilling operations, excavations, trenching, and will provide monitoring to oversee that appropriate levels of protection and safety procedures are utilized by C&S Engineers, Inc., personnel. The use of salamanders or other equipment with an open flame is prohibited and the use of protective clothing, especially hard hats and boots, will be required during drilling or other heavy equipment operations.

10.2.2 Excavations and Excavation Trenching

Guidance relating to safe work practices for C&S employees regarding excavations and excavating/trenching operation is presented in Appendix A of this HASP.

SECTION 11 - DECONTAMINATION PROCEDURES

Decontamination involves physically removing contaminants and/or converting them chemically into innocuous substances. Only general guidance can be given on methods and techniques for decontamination. Decontamination procedures are designed to:

- Remove contaminant(s).
- Avoid spreading the contamination from the work zone.
- Avoid exposing unprotected personnel outside of the work zone to contaminants.

Contamination avoidance is the first and best method for preventing spread of contamination from a hazardous site. Each person involved in site operations must practice the basic methods of contamination avoidance listed below. Additional precautions may be required in the HASP.

- Know the limitations of all protective equipment being used.
- Do not enter a contaminated area unless it is necessary to carry out a specific objective.
- When in a contaminated area, avoid touching anything unnecessarily.
- Walk around pools of liquids, discolored areas, or any area that shows evidence of possible contamination.
- Walk upwind of contamination, if possible.
- Do not sit or lean against anything in a contaminated area. If you must kneel (e.g., to take samples), use a plastic ground sheet.
- If at all possible, do not set sampling equipment directly on contaminated areas. Place equipment on a protective cover such as a ground cloth.
- Use the proper tools necessary to safely conduct the work.

Specific methods that may reduce the chance of contamination are:

- Use of remote sampling techniques.
- Opening containers by non-manual means.
- Bagging monitoring instruments.
- Use of drum grapplers.
- Watering down dusty areas.

Equipment which will need to be decontaminated includes tools, monitoring equipment, and personal protective equipment. Items to be decontaminated will be brushed off, rinsed, and

dropped into a plastic container supplied for that purpose. They will then be washed with a detergent solution and rinsed with clean water. Monitoring instruments may be wrapped in plastic bags prior to entering the field in order to reduce the potential for contamination. Instrumentation that is contaminated during field operations will be carefully wiped down. Heavy equipment, if utilized for operations where it may be contaminated, will have prescribed decontamination procedures to prevent contaminant materials from potentially leaving the Site. On-site contractors, such as drillers or backhoe operators, will be responsible for decontaminating all construction equipment prior to demobilization.

SECTION 12 – DISPOSAL PROCEDURES

All discarded materials, waste materials, or other objects shall be handled in such a way as to reduce or eliminate the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on-site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary and segregated for proper disposal. All contaminated waste materials shall be disposed of as required by the provisions included in the contract and consistent with regulatory provisions. All non-contaminated materials shall be collected and bagged for appropriate disposal. Investigation derived waste will be managed consistent with the work plan for this Site and DER-10 Technical Guidance for Site Investigation and Remediation dated May 2010.

SECTION 13 - EMERGENCY RESPONSE PROCEDURES

As a result of the hazards at the Site, and the conditions under which operations are conducted, there is the possibility of emergency situations. This section establishes procedures for the implementation of an emergency plan.

13.1 Emergency Coordinator

Emergency Coordinator: .....Daniel Riker .....Work Phone: (716) 847-1640

The Emergency Coordinator or his on-site designee will, in concert with New York State Office of Parks, Recreation and Historic Preservation will implement the emergency response procedures whenever conditions at the Site warrant such action. The Emergency Coordinator or his on-site designee will be responsible for assuring the evacuation, emergency treatment, emergency

transport of C&S personnel as necessary, and notification of emergency response units (refer to phone listing in the beginning of this HASP) and the appropriate management staff.

13.2 Evacuation

In the event of an emergency situation, such as fire, explosion, significant release of toxic gases, etc., all personnel will evacuate and assemble in a designated assembly area. The Emergency Coordinator or his on-site designee will have authority to contact outside services as required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The Emergency Coordinator or his on-site designee must see that access for emergency equipment is provided and that all ignition sources have been shut down once the emergency situation is established. Once the safety of all personnel is established, the Fire Department and other emergency response groups will be notified by telephone of the emergency.

13.3 Potential or Actual Fire or Explosion

Immediately evacuate the Site and notify local fire and police departments, and other appropriate emergency response groups, if LEL values are above 25% in the work zone or if an actual fire or explosion has taken place.

13.4 Environmental Incident (spread or release of contamination)

Control or stop the spread of contamination if possible. Notify the Emergency Coordinator and the Project Manager. Other appropriate response groups will be notified as appropriate.

13.5 Personnel Injury

Emergency first aid shall be applied on-site as necessary. Then, decontaminate (en route if necessary) and transport the individual to nearest medical facility if needed. The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. The directions to the hospital are shown in Section 1 of this HASP and a map is shown in Attachment A.

13.6 Personnel Exposure

- *Skin Contact*: Use copious amounts of soap and water. Wash/rinse affected area thoroughly, and then provide appropriate medical attention. Eyes should be thoroughly rinsed with water for at least 15 minutes.
- *Inhalation*: Move to fresh air and/or, if necessary, decontaminate and transport to emergency medical facility.
- *Ingestion*: Decontaminate and transport to emergency medical facility.
- *Puncture Wound/Laceration*: Decontaminate, if possible, and transport to emergency medical facility.

13.7 Adverse Weather Conditions

In the event of adverse weather conditions, the HSO will determine if work can continue without sacrificing the health and safety of field workers.

13.8 Incident Investigation and Reporting

In the event of an incident, procedures discussed in the Medical Emergency/Incident Response Protocol, presented in Appendix B of this HASP, shall be followed.

SECTION 14 - COMMUNITY RELATIONS

14.1 Community Health and Safety Plan

14.1.1 Community Health and Safety Monitoring

As part of the site work, three general types of efforts are scheduled, including, non-intrusive reconnaissance tasks, sampling or monitoring tasks (monitoring point sampling), and intrusive tasks (test trenching, subsurface borings, monitoring well installation). During completion of general reconnaissance and sampling or monitoring tasks, potential for health and safety risks to off-site landowners or the local community are not anticipated.

During completion of intrusive efforts at or adjacent to the Site, health and safety monitoring efforts will be concentrated on the area or areas in which intrusive efforts are being completed. Since the air pathway is the most available and likely avenue for the release of potential contaminants to the atmosphere at or near the Site, in addition to limiting public or community

access to the areas in which intrusive efforts are completed, health and safety measures will primarily consist of monitoring the air pathway for worker exposure.

14.1.2 Community Air Monitoring Plan

Efforts will be taken to complete field work in a manner which will minimize the creation of airborne dust or particulates. Under dry conditions, work areas may be wetted to control dust. During periods of extreme wind, intrusive field work may be halted until such time as the potential for creating airborne dust or particulate matter as a result of investigation activities is limited. Periodic monitoring following the guidelines of the site's Community Air Monitoring Plan (attached) will be implemented during all non-intrusive Site investigation activities, including surface soil and sediment sampling, and collection of groundwater samples from groundwater monitoring wells.

During completion of Site investigation, a community air monitoring plan meeting the requirements of the site's Community Air Monitoring Plan (attcahed) will be implemented for the duration of intrusive activities. These additional air monitoring activities will include establishment of background conditions, continuous monitoring for volatile organic compounds and/or particulates at the downwind work area (exclusion zone) perimeter, recording of monitoring data, and institution and documentation of Response Levels and appropriate actions in accordance with NYSDOH guidance.

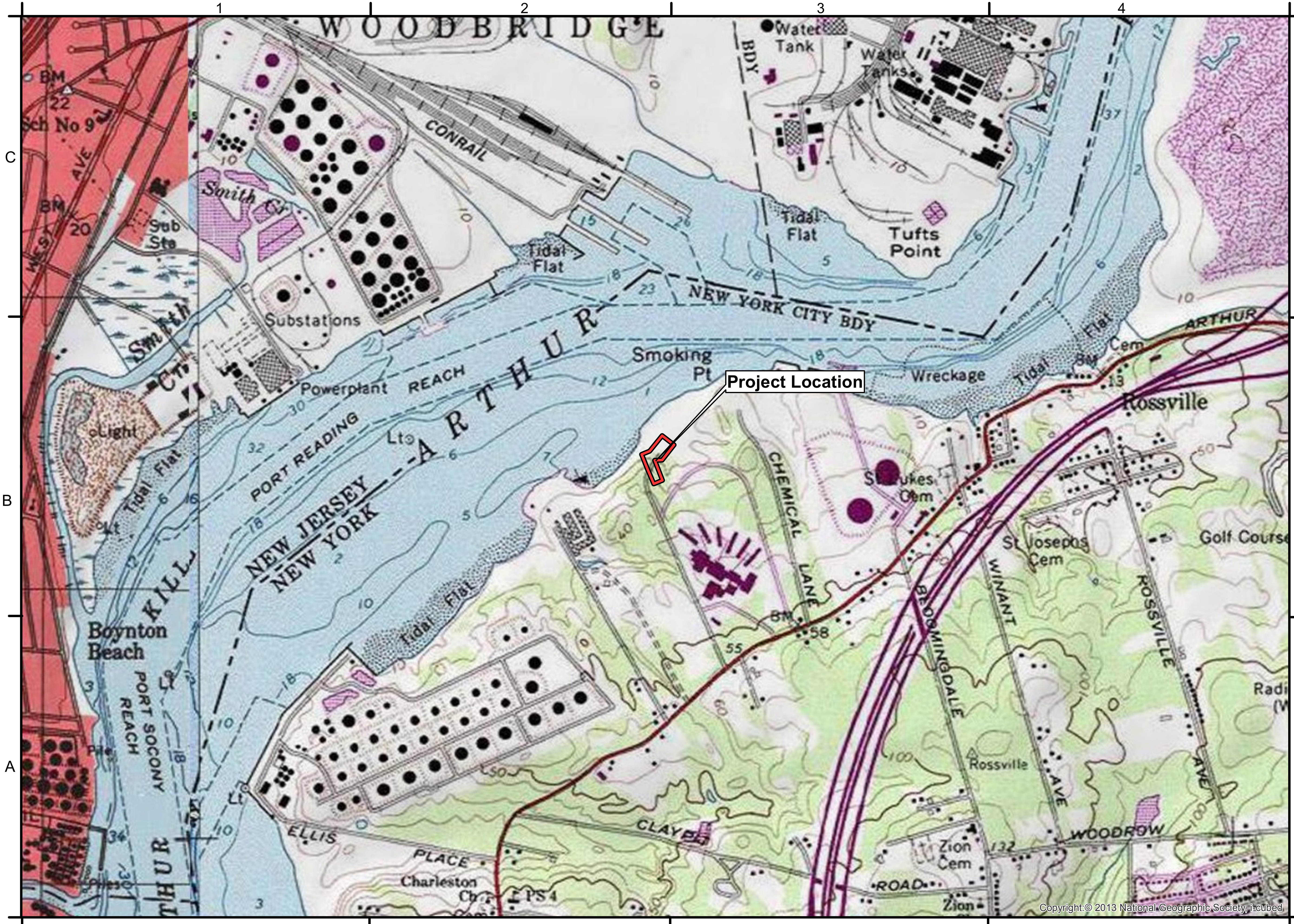
SECTION 15 - AUTHORIZATIONS

Personnel authorized to enter the Site while operations are being conducted must be approved by the HSO. Authorization will involve completion of appropriate training courses, medical examination requirements, and review and sign-off of this HASP. No C&S personnel should enter the work zone alone. Each site visitor should check in with the HSO or Project Manager prior to entering the work zones.

FIGURE 1

SITE LOCATION MAP

C&S ENGINEERS



C&S COMPANIES®

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd.
Syracuse, New York 13212
Phone: 315-455-2000
Fax: 315-455-9667
www.cscos.com

Legend

Site Area Boundary

N W E S

0 1,000 Feet

1 inch = 1,000 feet

SITE MANAGEMENT PLAN
ARTHUR KILL CORRECTIONAL FACILITY
STATEN ISLAND, NEW YORK

PROJECT NO:	190
DATE:	May 2014
SCALE:	AS SHOWN
DRAWN BY:	WNR
DESIGNED BY:	WNR
CHECKED BY:	RW

F:\Project\190 - NYSOGS\190461010 - Arthur Kill Correctional Facility Firing Range\Design\GIS\Projects\Figure_1_RI.mxd

Project Location Map

Figure 1

FIGURE 2

SITE AERIAL PHOTO

C&S ENGINEERS

Legend

- Site Boundary
- NWI Wetland Boundary

Notes

1) Coordinate System: NAD 1983 StatePlane NY Long Island FIPS 3104
Projection: Transverse Mercator
Datum: North American 1983
Units: Foot US

0 60 120 240 Feet

C&S Engineers, Inc.
141 Elm Street
Buffalo, New York 14203
Phone: 716-847-1630
Fax: 716-847-1454
www.cscos.com

N

ARTHUR KILL CORRECTIONAL FACILITY FIRING RANGES
SITE MANAGEMENT PLAN
STATEN ISLAND, NEW YORK

MARK	DATE	DESCRIPTION
REVISIONS		

PROJECT NO:	190.461.010
DATE:	JUNE 19, 2015
DRAWN BY:	A. DEMARCHI
DESIGNED BY:	A. DEMARCHI
CHECKED BY:	D. RIKER

SITE DETAIL

FIGURE 2

Path: F:\Project\190 - NYSOGS\190461010 - Arthur Kill Correctional Facility Firing Range\Design\GIS\Projects\SC_Figure_1_working.mxd

ATTACHMENT A

MAP TO HOSPITAL

C&S ENGINEERS

ATTACHMENT A - Directions to Staten Island University Hospital - South Campus

Notes

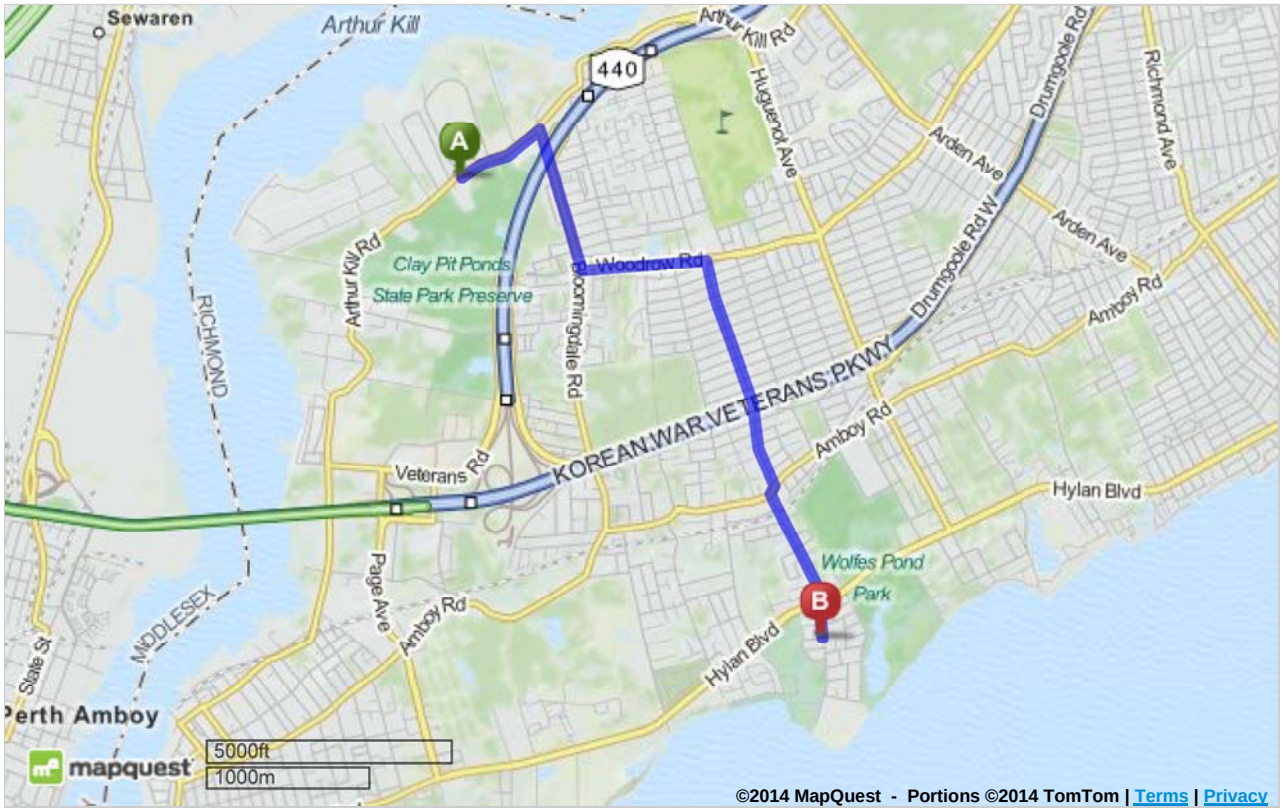
Trip to:

Staten Island University Hospital-South
375 Seguine Ave
Staten Island, NY 10309
(718) 226-2000
3.44 miles / 9 minutes

A	**2911 Arthur Kill Rd**, Staten Island, NY 10309-1101	**Download Free App**
	1. Start out going **northeast** on **Arthur Kill Rd** toward **Chemical Ln**. Map	**0.4 Mi** *0.4 Mi Total*
	2. Turn **right** onto **Bloomingdale Rd**. Map *Bloomingdale Rd is 0.1 miles past Chemical Ln* *SUNOCO is on the right* *If you reach Zebra Pl you've gone about 0.2 miles too far*	**0.7 Mi** *1.1 Mi Total*
	3. Turn **left** onto **Woodrow Rd**. Map *Woodrow Rd is just past Kramer Ave* *If you reach Claypit Rd you've gone a little too far*	**0.6 Mi** *1.6 Mi Total*
	4. Turn **right** onto **Foster Rd**. Map *Foster Rd is just past Rossville Ave* *If you reach Alverson Ave you've gone a little too far*	**1.1 Mi** *2.7 Mi Total*
	5. Turn **right** onto **Amboy Rd**. Map *GULF is on the right*	**0.04 Mi** *2.8 Mi Total*
	6. Take the 1st **left** onto **Seguine Ave**. Map *Cucumber Sushi and Salad Bar is on the corner* *If you reach Odell Pl you've gone a little too far*	**0.7 Mi** *3.4 Mi Total*
	7. **375 SEGUINE AVE** is on the **left**. Map *Your destination is just past Keating St* *If you reach Memo St you've gone a little too far*	
B	**Staten Island University Hospital-South** 375 Seguine Ave, Staten Island, NY 10309 (718) 226-2000	

HEALTH AND SAFETY PLAN
ARTHUR KILL CORRECTIONAL FACILITY
STATEN ISLAND, NEW YORK

Total Travel Estimate: **3.44 miles - about 9 minutes**



Appendix A

EXCAVATION/TRENCHING GUIDELINE

C&S ENGINEERS

C&S ENGINEERS, INC. HEALTH & SAFETY GUIDELINE #14
EXCAVATION/TRENCHING OPERATIONS

TABLE OF CONTENTS

C&S ENGINEERS, INC.
EXCAVATION/TRENCHING OPERATIONS

1.0 PURPOSE

To establish safe operating procedures for excavation/trenching operations at C&S work sites.

2.0 SCOPE

Applies to all C&S activity where excavation or trenching operations take place.

3.0 DEFINITIONS

Excavation — Any manmade cavity or depression in the earth's surface, including its sides, walls, or faces, formed by earth removal and producing unsupported earth conditions by reasons of the excavation.

Trench — A narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet.

4.0 RESPONSIBILITY EMPLOYEES

Employees — All employees must understand and follow the procedures outlined in this guideline during all excavation and trenching operations.

Health and Safety Coordinator/Officer (HSC/HSO) - The HSC/HSO is responsible for ensuring that these procedures are implemented at each work site.

5.0 GUIDELINES

5.1 Hazards Associated With Excavation/Trenching

The principal hazards associated with excavation/trenching are:

- Suffocation, crushing, or other injury from falling material.
- Damage/failure of installed underground services and consequent hazards.
- Tripping, slipping, or falling.
- Possibility of explosive, flammable, toxic, or oxygen-deficient atmosphere in excavation.

5.2 Procedures Prior to Excavation

1. Underground Utilities

   - Determine the presence and location of any underground chemical or utility pipes, electrical, telephone, or instrument wire or cables.
   - If the local DigSafely NY is unable to locate private/domestic or plant utilities, then an independent utility locating service must be contacted and mobilized to the site.
   - Identify the location of underground services by stakes, markers or paint.
   - Arrange to de-energize or isolate underground services during excavation. If not possible, or if location is not definite, method of excavation shall be established to minimize hazards by such means as:

     a) Use of hand tools in area of underground services.
     b) Insulating personnel and equipment from possible electrical contact.
     c) Use of tools or equipment that will reduce possibility of damage to underground services and hazard to worker.

2. Identify Excavation Area — Areas to be excavated shall be identified and segregated by means of barricades, ropes, and/or signs to prevent access of unauthorized personnel and equipment. Suitable means shall be provided to make barriers visible at all times.
3. Surface Water Provide means of diverting surface water from excavation.
4. Shoring/Bracing — Shoring or bracing that may be required for installed equipment adjacent to the excavation shall be designed by a competent person.
5. Structural Ramps — Structural ramps that are used solely by employees as a means of access to or egress from the excavation shall be designed by a competent person.

5.3 Procedures For Doing The Excavation

1. **Determine the need for shoring/sloping** — the type of soil will establish the need for shoring, slope of the excavation, support systems, and equipment to be used. The soil condition may change as the excavation proceeds. Appendices A, B, C, D, E, and F of the OSHA Excavation Regulation, 29 CFR 1926 Subpart P, are to be used in defining shoring and sloping requirements.

2. **Mobile equipment** — For safe use of mobile industrial equipment in or near the excavation, the load carrying capacity of soil shall be established and suitable protection against collapse of soil provided by the use of mats, barricades, restricting the location of equipment, or shoring.

3. Excavated material (spoil) shall be stored at least two (2) feet from the edge of the excavation.

4. All trench (vertical sides) excavations greater than five (5) feet deep shall be shored.

5. The excavation shall be inspected daily for changes in conditions, including the presence of ground water, change in soil condition, or effects of weather such as rain or freeze. A safe means of continuing the work shall be established based on changes in condition. Typically test trench excavations made as part of an environmental subsurface nvestigation are made and backfilled the same day.

6. Appropriate monitoring for gas, toxic, or flammable materials will be conducted to establish the need for respiratory equipment, ventilation, or other measures required to continue the excavation safely.

7. Adequate means of dewatering the excavation shall be provided by the contractor as required.

8. A signal person shall be provided to direct powered equipment if working in the excavation with other personnel.

9. A signal person shall be provided when backfilling excavations to direct powered equipment working in the excavation with other personnel.

10. Warning vests will be worn when employees are exposed to public vehicular traffic.

11. Employees shall stand away from vehicles being loaded or unloaded, and shall not be permitted underneath loads handled by lifting or dragging equipment.

12. Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available if hazardous atmospheric conditions exist or may be expected to develop. The specifics will be determined by the HSC/HSM.

13. Walkways or bridges with standard guardrail shall be provided where employees or equipment are required or permitted to cross over excavations.

5.4 Entering the Excavation

No C&S Engineers, Inc., employee shall enter an excavation which fails to meet the requirements of Section 5.3 of this guideline.

6.0 REFERENCES

29 CFR 1926, Subpart P - Excavations

7.0 ATTACHMENTS

29 CFR 1926 Subpart P - Appendices A, B, F

• **Part Number:**	1926
• **Part Title:**	Safety and Health Regulations for Construction
• **Subpart:**	P
• **Subpart Title:**	Excavations
• **Standard Number:**	1926 Subpart P App A
• **Title:**	Soil Classification

(a) Scope and application - (1) Scope. This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets for requirements, and describes acceptable visual and manual tests for use in classifying soils.

(2) Application. This appendix applies when a sloping or benching system is designed in accordance with the requirements set fo 1926.652(b)(2) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excav designed as a method of protection from cave-ins in accordance with appendix C to subpart P of part 1926, and when aluminum shoring is designed in accordance with appendix D. This Appendix also applies if other protective systems are designed and selec from data prepared in accordance with the requirements set forth in 1926.652(c), and the use of the data is predicated on the us classification system set forth in this appendix.

(b) Definitions. The definitions and examples given below are based on, in whole or in part, the following; American Society for T Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification System; The U.S. Department of Agriculture (US Textural Classification Scheme; and The National Bureau of Standards Report BSS-121.

"Cemented soil" means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

"Cohesive soil" means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

"Dry soil" means soil that does not exhibit visible signs of moisture content.

"Fissured" means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

"Granular soil" means gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

"Layered system" means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

"Moist soil" means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

"Plastic" means a property of a soil which allows the soil to be

deformed or molded without cracking, or appreciable volume change.
"Saturated soil" means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or sheer vane.
"Soil classification system" means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.
"Stable rock" means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.
"Submerged soil" means soil which is underwater or is free seeping.
"Type A" means cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:
(i) The soil is fissured; or
(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
(iii) The soil has been previously disturbed; or
(iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
(v) The material is subject to other factors that would require it to be classified as a less stable material.
"Type B" means:
(i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
(ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
(iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.
(iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or
(v) Dry rock that is not stable; or
(vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.
"Type C" means:
(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
(ii) Granular soils including gravel, sand, and loamy sand; or
(iii) Submerged soil or soil from which water is freely seeping; or
(iv) Submerged rock that is not stable, or
(v) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.
"Unconfined compressive strength" means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.
"Wet soil" means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(c) Requirements - (1) Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent perso Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.

(2) Basis of classification. The classification of the deposits shall be made based on the results of at least one visual and at least analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other reco methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Depart Agriculture textural classification system.

(3) Visual and manual analyses. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of thi shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify prc properties, factors, and conditions affecting the classification of the deposits.

(4) Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each laye classified individually where a more stable layer lies under a less stable layer.

(5) Reclassification. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any w changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumst

(d) Acceptable visual and manual tests. - (1) Visual tests. Visual analysis is conducted to determine qualitative information regarc excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil take samples from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the amounts of the particle sizes. Soil that is primarily composed of fine-grained material material is cohesive material. Soil composec of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does nc clumps is granular.

(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tens could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of m ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground s and to identify previously disturbed soil.

(v) Observed the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slop the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water see the sides of the excavation, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the s the excavation face.

(2) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil a provide more information in order to classify soil properly.

(i) Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohe material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch be held on one end without tearing, the soil is cohesive.

(ii) Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is g combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clu only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps wh break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the s considered unfissured.

(iii) Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive so test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designatior "Standard Recommended Practice for Description of Soils (Visual - Manual Procedure).") Type A soils with an unconfined compre strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great eff soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molde finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicat excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influe flooding), the classification of the soil must be changed accordingly.

(iv) Other strength tests. Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetron using a hand-operated shearvane.

(v) Drying test. The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesi and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.5 six inches (15.24 cm) in diameter until it is thoroughly dry:

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil ha cohesive material content. The soil can be classified as an unfissured cohesive material and the unconfined compressive strength determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the t pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cc fissures. If they pulverize easily into very small fragments, the material is granular.

Next Standard (1926 Subpart P App B)

Regulations (Standards - 29 CFR) - Table of Contents

U.S. Department of Labor | Occupational Safety & Health Administration | 200 Constitution Ave., NW, Washington, D
Telephone: 800-321-OSHA (6742) | TTY: 877-889-5627

www.OSHA.gov

• **Part Number:**	1926
• **Part Title:**	Safety and Health Regulations for Construction
• **Subpart:**	P
• **Subpart Title:**	Excavations
• **Standard Number:**	1926 Subpart P App B
• **Title:**	Sloping and Benching

(a) ***Scope and application***. This appendix contains specifications for sloping and benching when used as methods of protecting working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protectiv is to be performed in accordance with the requirements set forth in § 1926.652(b)(2).

(b) ***Definitions***.

Actual slope means the slope to which an excavation face is excavated.

Distress means that the soil is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phen the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slu material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the fa excavation; and ravelling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the excavation and trickling or rolling down into the excavation.

Maximum allowable slope means the steepest incline of an excavation face that is acceptable for the most favorable site condi protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

Short term exposure means a period of time less than or equal to 24 hours that an excavation is open.

(c) ***Requirements*** -- (1) ***Soil classification***. Soil and rock deposits shall be classified in accordance with appendix A to subpart I 1926.

(2) ***Maximum allowable slope***. The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of tl appendix.

(3) ***Actual slope***. (i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occur slope shall be cut back to an actual slope which is at least ½ horizontal to one vertical (½H:1V) less steep than the maximum allo slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person sh determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with § 1926.651(i).

(4) ***Configurations***. Configurations of sloping and benching systems shall be in accordance with Figure B-1.

TABLE B-1
MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V)(1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP(3)
STABLE ROCK	VERTICAL (90°)
TYPE A (2)	3/4:1 (53°)
TYPE B	1:1 (45°)
TYPE C	1 ½:1 (34°)

Footnote(1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angle rounded off.

Footnote(2) A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feed (3.67 m) or l depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).

Footnote(3) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

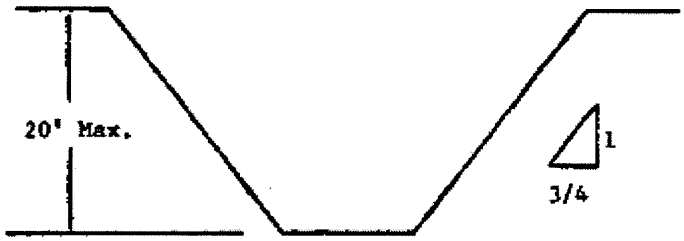
Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

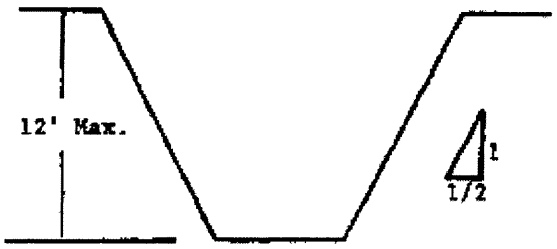
B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of ¾:1.



SIMPLE SLOPE -- GENERAL

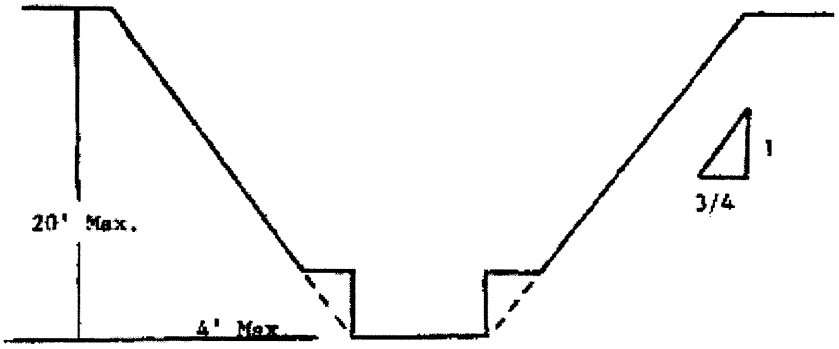
Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have maximum allowable slope of ½:1.



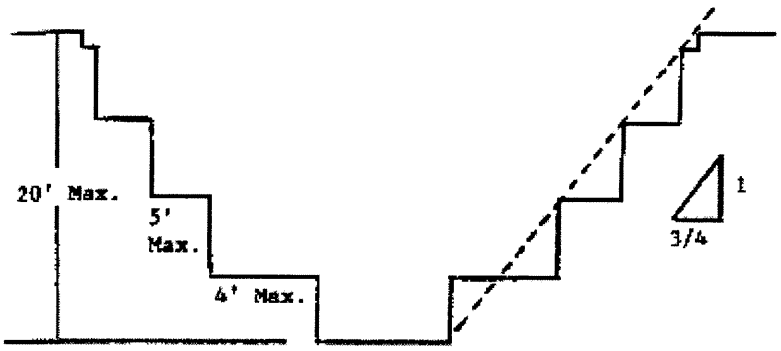
SIMPLE SLOPE -- SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimens

follows:

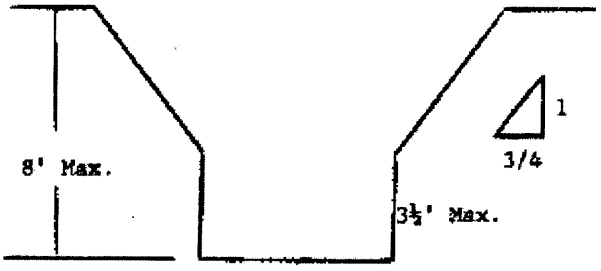


SIMPLE BENCH



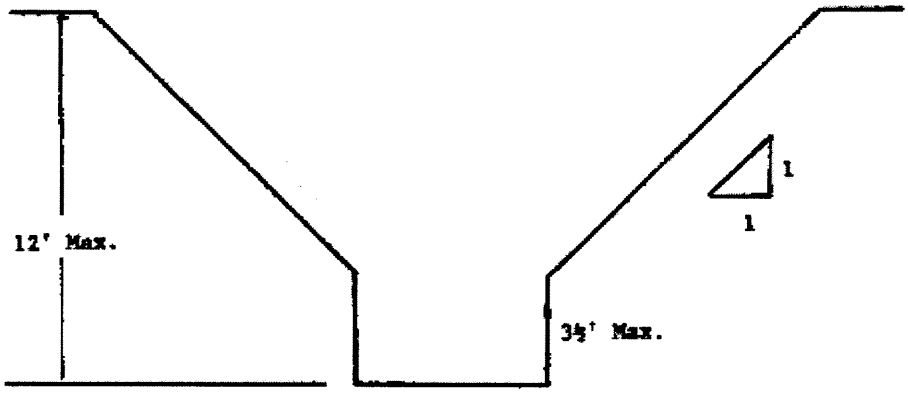
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical sid feet.



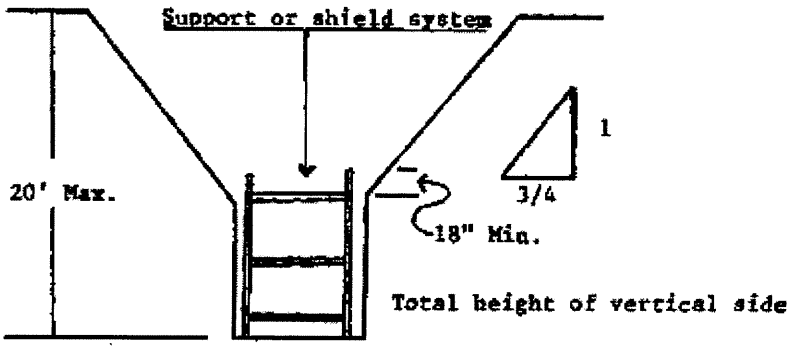
UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 8 FEET IN DEPTH)

All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a r allowable slope of 1:1 and a maximum vertical side of 3½ feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 12 FEET IN DEPTH)

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maxi allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

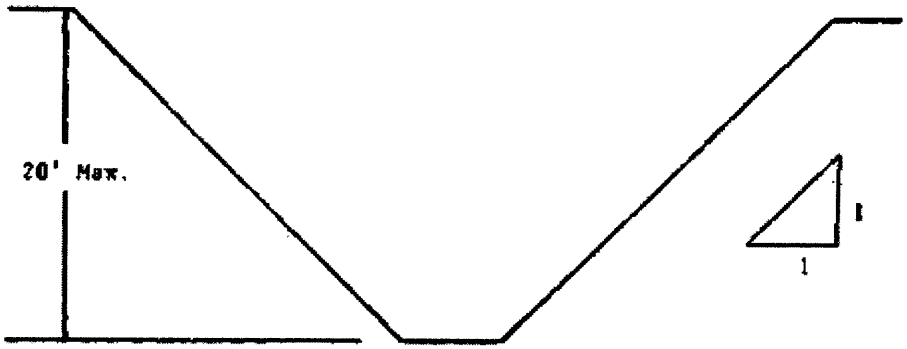


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other opt permitted under § 1926.652(b).

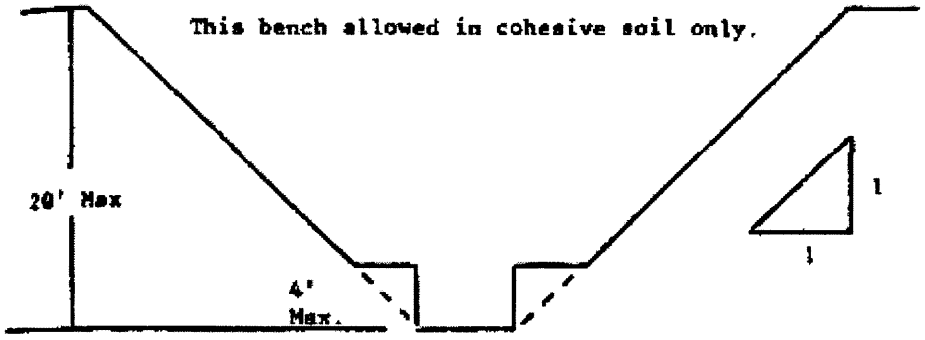
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

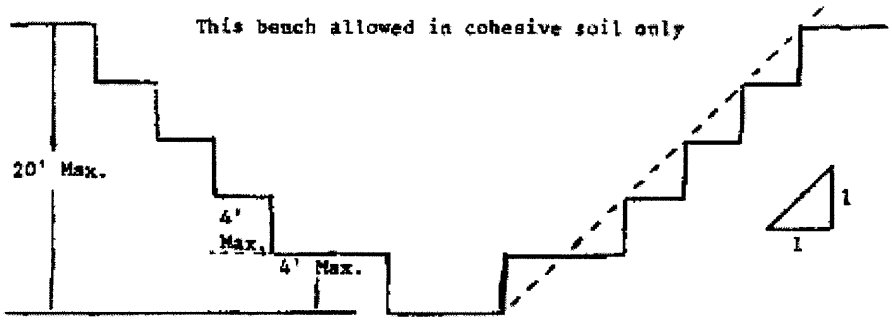


SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions

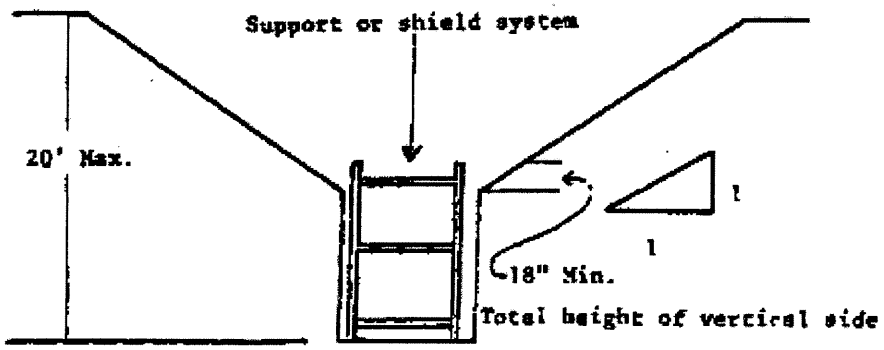


SINGLE BENCH



MULTIPLE BENCH

3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at le inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

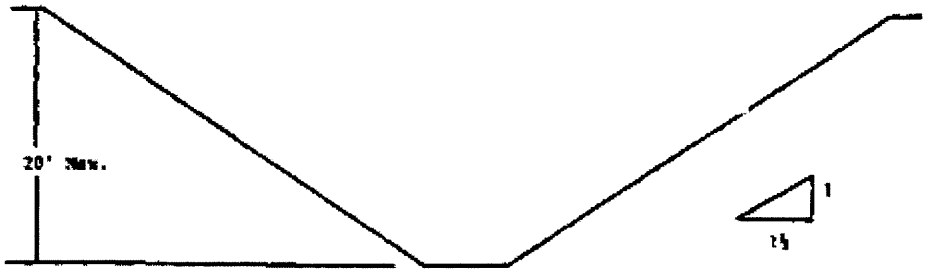


VERTICALLY SIDED LOWER PORTION

4. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

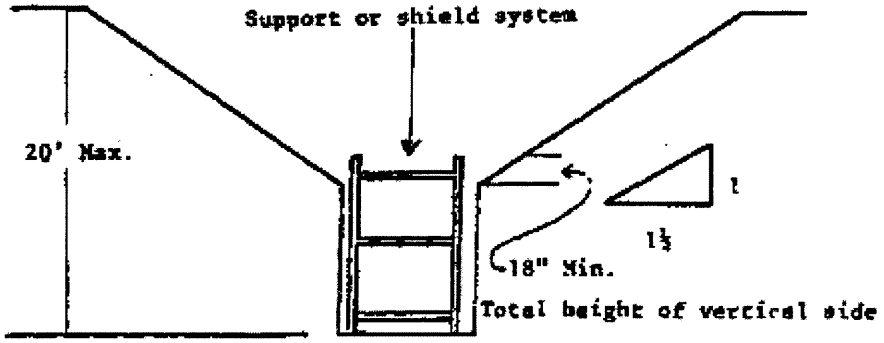
B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



SIMPLE SLOPE

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at le inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.

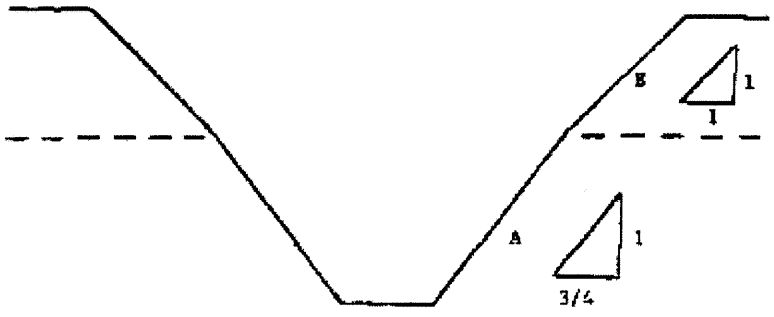


VERTICAL SIDED LOWER PORTION

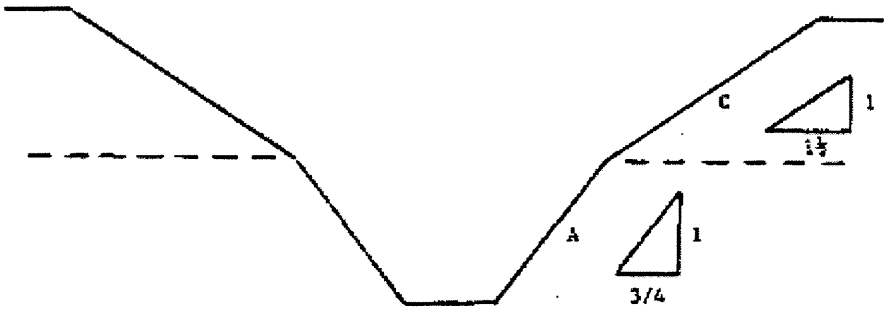
3. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

B-1.4 Excavations Made in Layered Soils

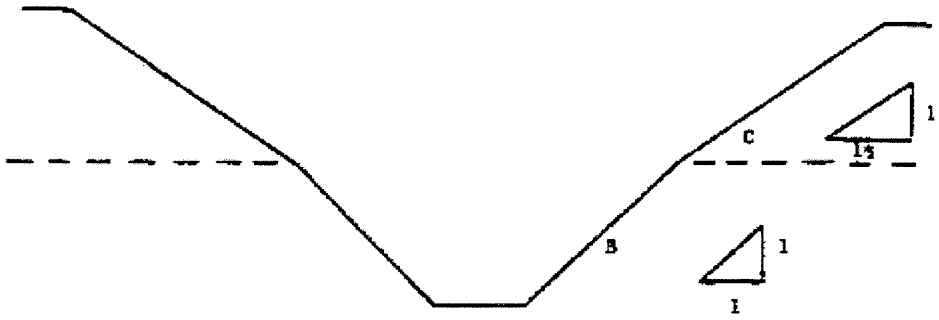
1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth b



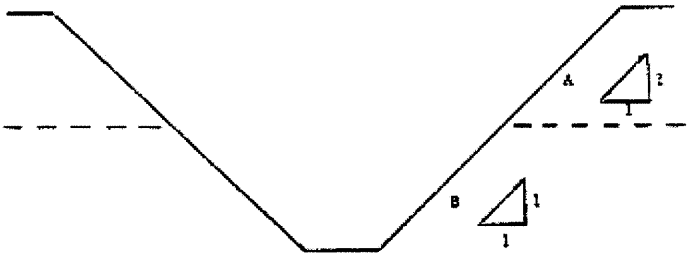
B OVER A



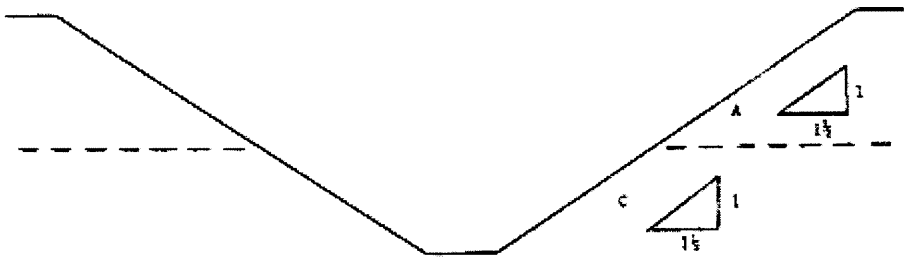
C OVER A



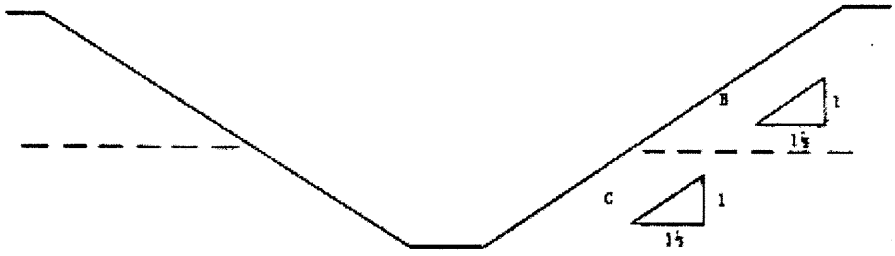
C OVER B



A OVER B



A OVER C



B OVER C

2. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

Next Standard (1926 Subpart P App C)

Regulations (Standards - 29 CFR) - Table of Contents

• **Part Number:**	1926
• **Part Title:**	Safety and Health Regulations for Construction
• **Subpart:**	P
• **Subpart Title:**	Excavations
• **Standard Number:**	1926 Subpart P App F
• **Title:**	Selection of Protective Systems

The following figures are a graphic summary of the requirements contained in subpart P for excavations 20 feet or less in depth. Prc systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance wit 1926.652(b) and (c).

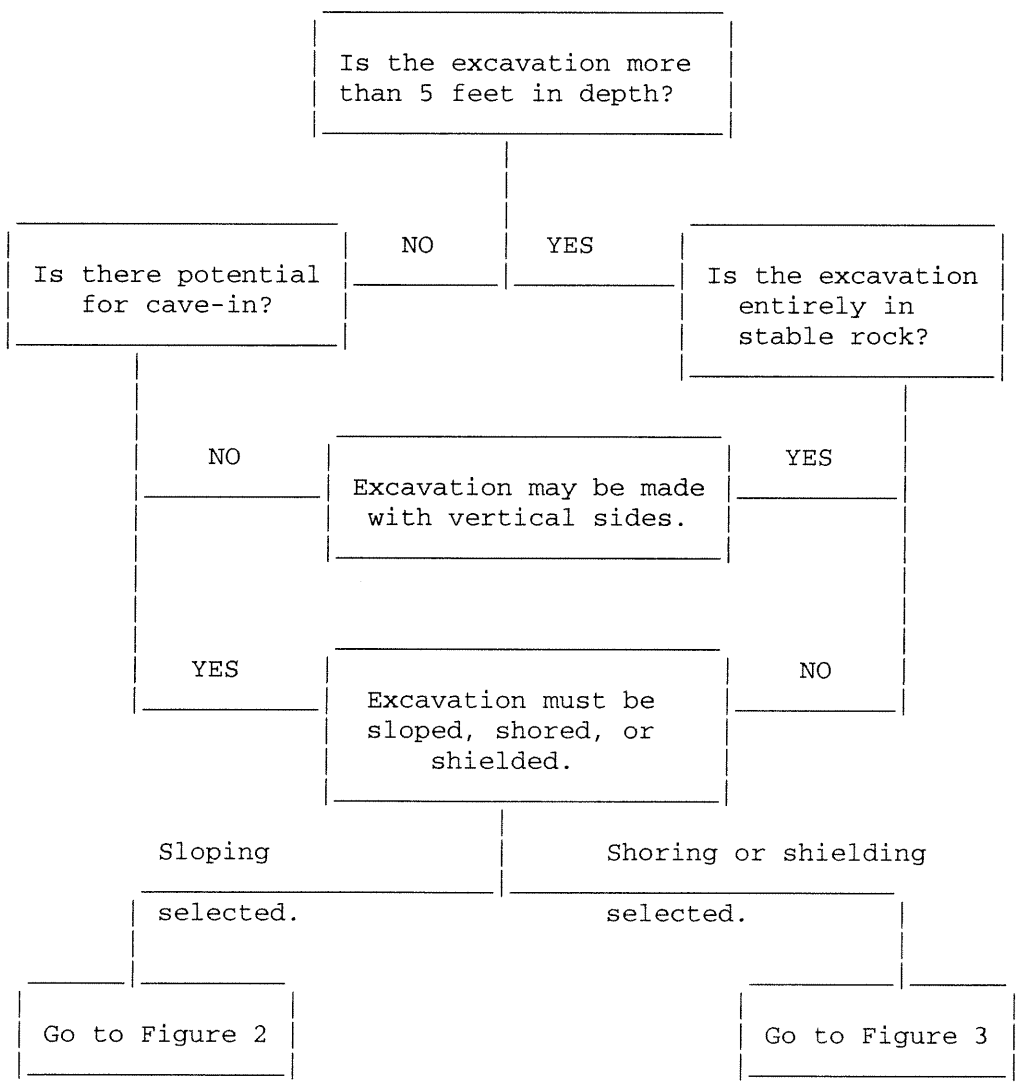


FIGURE 1 - PRELIMINARY DECISIONS

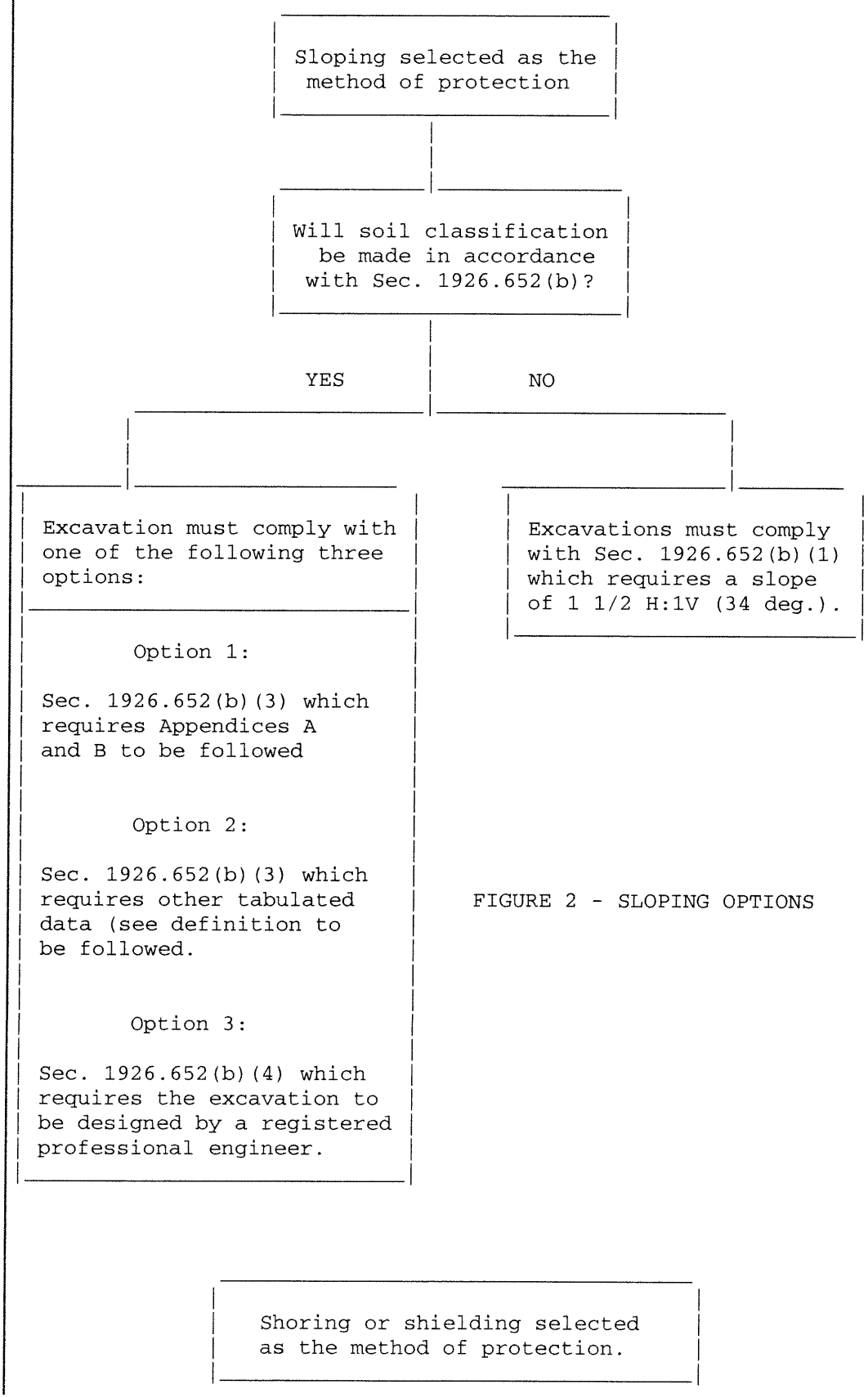


FIGURE 2 - SLOPING OPTIONS

Shoring or shielding selected as the method of protection.

Soil Classification is required when shoring or shielding is used. The excavation must comply with one of the following four options:

Option 1

Sec. 1926.652(c)(1) which requires Appendices A and C to be followed (e.g. timber shoring).

Option 2

Sec. 1926.652(c)(2) which requires manufacturers data to be followed (e.g. hydraulic shoring, trench jacks, air shores, shields).

Option 3

Sec. 1926.652(c)(3) which requires tabulated data (see definition) to be followed (e.g. any system as per the tabulated data).

Option 4

Sec. 1926.652(c)(4) which requires the excavation to be designed by a registered professional engineer (e.g. any designed system).

FIGURE 3 - SHORING AND SHIELDING OPTIONS

Appendix B

GUIDANCE ON INCIDENT INVESTIGATION

AND REPORTING

C&S ENGINEERS

MEDICAL EMERGENCY/INCIDENT RESPONSE PROTOCOL

1.0 PURPOSE

From time to time employees of C & S Engineers, Inc. will sustain an injury while working on the job. While every effort is being made to prevent this, in the event of an injury or illness on the job, the following procedures will be implemented. This format may also be utilized in the event of a property damage incident.

2.0 SCOPE

This guideline applies to all C & S Engineers, Inc. job sites and employees.

3.0 GUIDELINES

Upon notification or awareness of an incident/accident with injuries or illness the Emergency Coordinator or his On-Site Designee will:

1. Ensure that the injured employee is receiving immediate first aid and medical care.
2. Notify Emergency Services (911) if injuries are severe.
3. Stabilize the work area; ensure that no one else can be injured.
4. Notify the Project Manager at the earliest possible convenience**.**
5. Notify the Owner/Client at the earliest possible convenience.

To assist the Health and Safety Manager in the root cause analysis, the Emergency Coordinator or his On-Site Designee will also make an attempt to:

1. Obtain the names and phone numbers of witnesses.
2. Preserve the accident scene if possible for analysis.

Injury Management

1. If the patient is stable with non-life threatening injuries, the foreman will ensure the employee is transported to Mount St. Mary's Hospital of Niagara Falls.

   At no time will an injured employee drive themselves to medical care.

2. If the patient has serious or life threatening injuries, the emergency coordinator or his on-site designee will notify the emergency services for the area for treatment and transport to a hospital or emergency room. Serious injuries can be considered but not limited to head injuries, loss of consciousness, severe laceration or amputation, fractured bones, burns and eye injuries.

3. Following the treatment and care of the injured employee, the emergency coordinator or his on-site designee and the project manager will initiate the completion of the first injury report. The Health & Safety Manager will assist.

Project Manager

1. Upon notification of a personal injury or illness on the job site, will notify C & S Engineers, Inc, President and Corporate Legal and C&S Companies Health and Safety Manager.
2. Will report to the worksite to initiate the first injury report.
3. Will report to the treatment facility to check on the well being of the injured employee. The project manager will ensure that the treatment facility is aware that this is a workers compensation case.
4. Will assist the Health and Safety Manager in the analysis of the incident.

Health & Safety Manager

1. Upon notification of the personal injury will determined if it is necessary to report to the treatment facility or the accident site, depending on the nature of the injuries and the circumstances of the accident.
2. Will report to the worksite to begin a root cause analysis investigation of the accident. The investigation may include interview of witnesses, field crew , and project manager, the photographing of the scene, reconstruction of the accident scene, using test instruments and taking measurements. The Health and Safety Manager may draw diagrams from the information learned.
3. The Health and Safety Manager will work with the owner/client as necessary to investigate the accident.
4. The Health & Safety manager will ensure that the site is safe to resume work.
5. The Health & Safety Manager shall initiate the New York State Compensation form requirements (C-2) and forward a copy of the C-2 to the C & S Engineers, Inc. controller for transmittal to the Compensation Carrier within 8 hrs of notification of the incident or by the end of the next business day.
6. The Health and Safety manager, upon completion of the investigation, will provide the Project Manager with a written investigative report (copy to the President)
7. The accident will be reviewed at the next Project Managers meeting with the intent to prevent further or similar events on other projects.
8. The Health & Safety Manager will assess the incident to determine OSHA record ability and make record if necessary on the OSHA 300 form, within five working days.

Incident Response

1.0 PURPOSE

To prevent the occurrence of accidents on C&S Engineers, Inc., work sites and to establish a procedure for investigation and reporting of incidents occurring in, or related to C&S work activities.

2.0 SCOPE

Applies to all incidents related to C&S Engineers, Inc. work activities.

3.0 DEFINITIONS

Accident - An undesired event resulting in personal injury and/or property damage, and/or equipment failure.

Fatality - An injury or illness resulting in death of the individual.

Incident - Any occurrence which results in, or could potentially result in, the need for medical care or property damage. Such incidents shall include lost time accidents or illness, medical treatment cases, unplanned exposure to toxic materials or any other significant occurrence resulting in property damage or in "near misses."

Incidence Rate - the number of injuries, illnesses, or lost workdays related to a common exposure base of 100 full-time workers. The rate is calculated as:

N/EH x 200,000

N = number of injuries and illnesses or lost workday cases; EH = total hours worked by all associates during calendar year. 200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year).

Injury - An injury such as a cut, fracture, sprain, amputation, etc. which results from a work accident or from a single instantaneous event in the work environment.

Lost Workday Case - A lost workday case occurs when an injured or ill employee experiences days away from work beginning with the next scheduled work day. Lost workday cases do not occur unless the employee is effected beyond the day of injury or onset of illness.

Recordable Illness - An illness that results from the course of employment and must be entered on the OSHA 300 Log and Summary of Occupational Injuries and Illnesses. These illnesses require medical treatment and evaluation of work related injury. For example, dermatitis, bronchitis, irritation of eyes, nose, and throat can result from work and non-work related incidents.

Recordable Injury - An injury that results from the course of employment and must be entered on the OSHA 300 Log and Summary of Occupational Injuries and Illnesses. These injuries require medical treatment; may involve loss of consciousness; may result in restriction of work or motion or transfer to another job; or result in a fatality.

Near Miss - An incident which, if occurring at a different time or in a different personnel or equipment configuration, would have resulted in an incident.

4.0 RESPONSIBILITIES

Employees - It shall be the responsibility of all C&S Engineers, Inc. employees to report all incidents as soon as possible to the HSC, regardless of the severity.

Human Resources - has overall responsibility for maintaining accident/ incident reporting and investigations according to current regulations and recording injuries/ illness on the OSHA 300 log, and posting the OSHA 300 log.

Emergency Coordinator - It is the responsibility of the Emergency Coordinator to investigate and prepare an appropriate report of all accidents, illnesses, and incidents occurring on or related to C&S Engineers, Inc. work. The Emergency Coordinator shall complete Attachment A within 24 hours of the incident occurrence.

Health and Safety Manager (HSM) - It is the responsibility of the HSM to investigate and prepare an appropriate report of all lost time injuries and illnesses and significant incidents occurring on or related to C&S Companies. The HSM shall maintain the OSHA 300 form.

Project Managers (PM) - It shall be the PM's responsibility to promptly correct any deficiencies in personnel, training, actions, or any site or equipment deficiencies that were determined to cause or contribute to the incident investigated.

5.0 GUIDELINES

5.1 Incident Investigation

The Project Manager will immediately investigate the circumstances surrounding the incident and will make recommendations to prevent recurrence. The HSM shall be immediately notified by telephone if a serious accident/ incident occurs. The incident shall be evaluated to determine whether it is OSHA recordable. If the incident is determined to be OSHA 300 recordable, it shall be entered on the OSHA 300 form.

The Project Manager with assistance from the HSM must submit to the office an incident report form pertaining to any incident resulting in injury or property damage.

5.2 Incident Report

The completed incident report must be completed by the Project Manager within 12 hours of the incident and distributed to the HSM, and Human Resources. This form shall be maintained by Human Resources for at least five years for all OSHA recordable cases. This form serves as an equivalent to the OSHA 101 form.

5.3 Incident Follow-up Report

The Incident Follow-Up Report (Attachment B) shall be distributed with the Incident Report within one week of the incident. Delay in filing this report shall be explained in a brief memorandum.

5.4 Reporting of Fatalities or Multiple Hospitalization Accidents

Fatalities or accidents resulting in the hospitalization of three or more employees must be reported to OSHA verbally or in writing within 8 hours. The report must contain 1) circumstances surrounding the accident(s), 2) the number of fatalities, and 3) the extent of any injuries.

5.5 OSHA 300A Summary Form

Recordable cases must be entered on the log within six workdays of receipt of the information that a recordable case has occurred. The OSHA log must be kept updated to within 45 calendar days.
OSHA 300 forms must be updated during the 5 year retention period, if there is a change in the extent or outcome of an injury or illness which affects an entry on a log. If a change is necessary, the original entry should be lined out and a corrected entry made on that log. New entries should be made for previously unrecorded cases that are discovered or for cases that initially weren't recorded but were found to be recordable after the end of the year. Log totals should also be modified to reflect these changes.

5.5.1 Posting

The log must be summarized at the end of the calendar year and the summary must be posted from February 1 through May 31.

5.6 OSHA 300A

Facilities selected by the Bureau of Labor Statistics (BLS) to participate in surveys of occupational injuries and illnesses will receive the OSHA 300A. The data from the annual summary on the OSHA 300 log should be transferred to the OSHA 300A, other requested information provided and the form returned as instructed by the BLS.

5.7 Access to OSHA Records

All OSHA records (accident reporting forms and OSHA 300 logs) should be available for inspection and copying by authorized Federal and State government officials.

Employees, former employees, and their representatives must be given access for inspection and copying to only the log, OSHA No. 300, for the establishment in which the employee currently works or formerly worked.

6.0 REFERENCES

29 CFR Part 1904

7.0 ATTACHMENTS

Attachment A - Incident Investigation Form
Attachment B - Incident Follow-Up Report
Attachment C - Establishing Recordability

ATTACHMENT A

INCIDENT INVESTIGATION FORM

Accident investigation should include:

Location: _____

Time of Day: _____

Accident Type: _____

Victim: _____

Nature of Injury: _____

Released Injury: _____

Hazardous Material: _____

Unsafe Acts: _____

Unsafe Conditions: _____

Policies, Decisions: _____

_____

Personal Factors: _____

_____

Environmental Factors: _____

_____

_____

ATTACHMENT B

Date _____

Foreman: _____

INCIDENT FOLLOW-UP REPORT

Date of Incident: _____

Site: _____

Brief description of incident: _____

_____

_____

_____

_____

Outcome of incident: _____

_____

_____

_____

Physician's recommendations: _____

_____

_____

_____

Date the injured returned to work: _____

Project Manager Signature: _____

Date: _____

ATTACH ANY ADDITIONAL INFORMATION TO THIS FORM

ATTACHMENT C

ESTABLISHING RECORDABILITY

1. Deciding whether to record a case and how to classify the case.

   Determine whether a fatality, injury or illness is recordable.

   A fatality is recordable if:

   - Results from employment

   An injury is recordable if:

   - Results from employment and
   - It requires medical treatment beyond first aid or
   - Results in restricted work activity or job transfer, or
   - Results in lost work day or
   - Results in loss of consciousness

   An illness is recordable if:

   - It results from employment

2. Definition of "Resulting from Employment"

   Resulting from employment is when the injury or illness results from an event or exposure in the work environment. The work environment is primarily composed of: 1) The employer's premises, and 2) other locations where associates are engaged in work-related activities or are present as a condition of their employment.

   The employer's premises include company rest rooms, hallways, cafeterias, sidewalks and parking lots. Injuries occurring in these places are generally considered work related.

   The employer's premises EXCLUDES employer controlled ball fields, tennis courts, golf courses, parks, swimming pools, gyms, and other similar recreational facilities, used by associates on a voluntary basis for their own benefit, primarily during off work hours.

   Ordinary and customary commute, is not generally considered work related.

   Employees injured or taken ill while engaged in consuming food, as part of a normal break or activity is not considered work related. Employees injured or taken ill as the result of smoking, consuming illegal drugs, alcohol or applying make up are generally not considered work related. Employee injured by un authorized horseplay is generally not considered work related, however, an employee injured as a result of a fight or other workplace violence act, may be considered work related.

Associates who travel on company business are considered to be engaged in work related activities all the time they spend in the interest of the company. This includes travel to and from customer contacts, and entertaining or being entertained for purpose of promoting or discussing business. Incidents occurring during normal living activities (eating, sleeping, recreation) or if the associate deviates from a reasonably direct route of travel are not considered OSHA recordable.

3. Distinction between Medical Treatment and First Aid.

First aid is defined as any one-time treatment, and any follow up visit for the purpose of observation, of minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical care. Such one time treatment, and follow up visit for the purpose of observation, is considered first aid even though provided by a physician or registered professional personnel.

Medical Treatment (recordable)

a) They must be treated only by a physician or licensed medical personnel.

b) They impair bodily function (i.e. normal use of senses, limbs, etc.).

c) They result in damage to physical structure of a non superficial nature (fractures).

d) They involve complications requiring follow up medical treatment.

APPENDIX G

SITE MANAGEMENT FORMS

The following site-specific site management form should be completed during site inspection activities and provided to the NYSDEC in electronic format in accordance with the reporting requirements specified in Section 5.0 of the SMP. Additionally, the minimum reporting requirements described in Section 5.0 should be included in each inspection report as well as the periodic inspection reports.

Summary of Green Remediation Metrics for Site Management

Site Name: Arthur Kill Correctional Facility Firing Ranges Site Code: 243039
Address: 2911 Arthur Kill Road City: Staten Island
State: New York Zip Code: 10309 County: Richmond

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, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
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		
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:
Other:

CERTIFICATION BY CONTRACTOR
I, _____ (**Name**) do hereby certify that I am _____ (**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including that last day of the period covered by this application. _____ **Date** **Contractor**

ARTHUR KILL CORRECTIONAL FACILITY FIRING RANGES
SITE MANAGEMENT PLAN

NYSDEC SITE NUMBER: 243039

SITE-WIDE INSPECTION FORM

Date _____ **Inspector:** _____

Weather: _____ **Signature:** _____

Temperature: _____ **Company:** _____

Year: _____

Item Inspected	**Maintenance Needed (Y/N)**	**Comments**
General Site Conditions		
Trees, bushes, other vegetation		
Grass cover		

ARTHUR KILL CORRECTIONAL FACILITY FIRING RANGES
SITE MANAGEMENT PLAN

NYSDEC SITE NUMBER: 243039

INSPECTION FORM

Component	Item	Comments
Grass cover	Obvious subsidence, depressions or cracks Evidence of ponded water stressed or missing vegetation soil erosion due to surface runoff vegetables or farming conducted Other:	
Site Records	Review of previous inspection reports Site records are up to date. Other:	
Site Usage	Site is compliant with site usage requirements in the Deed Resriction. There are no vegetable gardens or farming on Site. Other:	

Date: _____ **Inspector**: _____