Lockheed Martin Corporation
497 Electronics Parkway
Liverpool, NY 13088

March 29, 2019

Mr. Jacky Luo
Project Manager
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7010

Re: *Updates to the February 2018 Bloody Brook Site Management Plan*
Bloody Brook, Onondaga County, New York

Dear Mr. Luo:

Enclosed please find updates to the *February 2018 Site Management Plan* for the Lockheed Martin Corporation Bloody Brook site for your review and approval. These updates reflect revisions since NYSDEC approval of the report submitted on February 15, 2018. The enclosed hard copies are on three-hole punched paper for insertion into the binder for the hard copy report previously submitted. The enclosed CD includes a full version of the updated report.

If you have any questions or you would like to discuss these updates, please contact me at (315) 456-1993 or Kelly Lurie at (518) 542-2944.

Sincerely,

Jill Fonte
Project Lead

Enclosure

cc (with enclosure): Bob Pezzimenti, Esq. – Lockheed Martin
R. Stan Phillips – Lockheed Martin
Norm Varney, Esq. – Lockheed Martin
Robert Nunes – USEPA, Region II

Rebecca Quail – NYSDEC
Harry Warner, P.E. – NYSDEC, Region 7
Robert R. Tyson, Esq. – Bond, Schoeneck & King
Mark Sergott - NYSDOH
Lisa Letteney – Onondaga County Department of Health
Alan Lorefice– NYSF&W
Benjamin Yaus, Esq. – Onondaga County Department of Law
Travis Glazier – Onondaga County Office of the Environment
Nicholas Capozza – Onondaga County Department of WEP
Colleen Gunnip – Town of Salina Supervisor
Doug Wickman – Town of Salina Engineer
Gary C. White – Village of Liverpool Mayor
Joseph Heath, Esq.
Thane Joyal, Esq.
Alma Lowry, Esq.
Jessica Shenandoah – Onondaga Nation
Nickcole Evans, P.E. – AECOM

cc (w/out enclosure): Argie Cirillo, Esq. – USEPA, Region II
Margaret Sheen, Esq. – NYSDEC
Maureen Schuck – NYSDOH
Curtis Waterman – HETF

BLOODY BROOK

ONONDAGA COUNTY

LIVERPOOL, NEW YORK

SITE MANAGEMENT PLAN

Prepared for:

Lockheed Martin Corporation
497 Electronics Parkway
Building EP-6, Room 100B
Liverpool, New York 13088

Prepared by:

AECOM
5015 Campuswood Drive, Suite 104
E. Syracuse, NY 13057

Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date
1	March 29, 2019	1. Revised main text to reflect updates since February 2018 (including Tables 5, 6, and 7). 2. Updated Record Drawings (Appendix B). 3. Updated Field Sampling Plan to reflect 2018 biological monitoring. 4. Revised Restoration Monitoring Plan (Appendix J) to address changes per the adaptive management approach in the wooded and wetland areas.	

MARCH 2019

CERTIFICATION STATEMENT

I, NICKCOLE EVANS, 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) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

NICKCOLE M. EVANS P.E.

MARCH 29, 2019 DATE

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ONONDAGA COUNTY
LIVERPOOL, NEW YORK

SITE MANAGEMENT PLAN

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List of Acronyms

ASP	Analytical Services Protocol
CAMP	Community Air Monitoring Plan
CLP	Contract Laboratory Program
COC	Certificate of Completion
COPC	Contaminant of Potential Concern
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
EWP	Excavation Work Plan
FSP	Field Sampling Plan
HASP	Health and Safety Plan
IC	Institutional Control
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RSO	Remedial System Optimization
SMP	Site Management Plan
USEPA	United States Environmental Protection Agency
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program
WBBB	West Branch of Bloody Brook

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 (SMP).

Site Identification: Bloody Brook Site, Onondaga County, New York, Former Voluntary Cleanup Program (VCP) Index No. D7-0001-01-09; Released March 21, 2018

Institutional Controls:	1. Provisions to address residual cadmium concentrations remaining at the site after remedial activities, as discussed in detail in Section 3.2.
	2. All engineering controls must be inspected at a frequency and in a manner defined in the SMP.
Engineering Controls:	1. Soil cover placed over a demarcation layer.

Inspections:	Frequency
1. Site-Wide	Annually
Monitoring:	
1. Restoration Monitoring	Annually for five years (see Section 4.2 for schedule)
2. Biological Monitoring	Two and four years following remediation
Maintenance:	
1. Erosion	As needed
2. Vegetation	As needed
Reporting:	
1. Restoration Monitoring Report	Annually for five years
2. Biological Monitoring Report	Two and four years following remediation
3. Periodic Review Report	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this SMP.

1 Introduction

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Bloody Brook site located in Liverpool, New York ("site"). See Figure 1. At the time this SMP was first developed, the site was in the New York State (NYS) Voluntary Cleanup Program (VCP) Index No. D7-0001-01-09, which was administered by New York State Department of Environmental Conservation (NYSDEC). Lockheed Martin Corporation (Lockheed Martin) entered into a Voluntary Cleanup Agreement (VCA) on July 20, 2002 with the NYSDEC to remediate the site. A Release and Covenant Not to Sue was issued by NYSDEC on March 21, 2018. Figure 2 shows the boundaries of the site.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "residual cadmium." Institutional and engineering controls (ICs and ECs) have been incorporated into the site remedy to control exposure to residual cadmium to ensure protection of public health and the environment.

This SMP was prepared to manage residual cadmium at the site. This plan has been approved by the NYSDEC in consultation with the New York State Department of Health (NYSDOH), and compliance with this plan is required per the March 2014 Decision Document for the Bloody Brook Voluntary Cleanup Program (2014 Decision Document). 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. Failure to properly implement the SMP is a violation of the 2014 Decision Document, which is grounds for revocation of the Certificate of Completion (COC);
- Failure to comply with this SMP is also a violation of Environmental Conservation Law and 6NYCRR Part 375, 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 A of this SMP.

This SMP was prepared by AECOM, on behalf of Lockheed Martin, 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 and ECs that are required by the 2014 Decision Document 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, post-remedial removal of contaminated soil, or other significant change to the site conditions. The NYSDEC will provide a notice of any approved changes to the SMP and will append these notices to the SMP that is retained in its files.

1.3 **Regulator Notifications**

Notifications will be submitted by Lockheed Martin or their representative to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice, following Lockheed Martin receiving notification or otherwise obtaining information, of any proposed changes in site use that are required under the terms of the 2014 Decision Document, 6NYCRR Part 375, and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the site management activities.
- Within 14 days following Lockheed Martin being notified of any activity that is anticipated to encounter remaining contamination, Lockheed Martin or their representative will notify the NYSDEC.
- Notice within 48-hours of any damage or defect to the foundation, structures, or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

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

- 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 2014 Decision Document 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 includes contact information for the above regulator notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

2 Summary of Previous Investigations and Remedial Actions

2.1 Site Location and Description

The site is located in the Town of Salina, and a portion of the site is located in the Village of Liverpool, Onondaga County, New York. Site location and area maps are included as Figures 1 and 2, respectively. Final Record Drawings based on a 2017 topographic survey of the site after completion of all restoration activities are provided in Appendix B. The site consists of the West Branch of Bloody Brook (WBBB) and Bloody Brook from below the confluence of the West and Middle Branches of Bloody Brook (collectively referred to as WBBB) and soil surrounding the WBBB and Bloody Brook downstream of the Thruway and ending at the upstream side of Onondaga Lake Parkway. This portion of the site is approximately 5,000 feet long and flows through lands of varied use including a wooded area, a residential area, an apartment complex, and a commercial/light industrial area.

Upstream of the site, the WBBB originates in a wetland area surrounded by industrial properties. This wetland is located between Vine Street and Crossroads Industrial Park. The WBBB flows southward and is routed through culverts that transmit the WBBB underneath Electronics Business Park and the Thruway. Downstream of the site, Bloody Brook flows under Onondaga Lake Parkway and discharges into Onondaga Lake. The WBBB and Bloody Brook obtains a substantial fraction of its flow from storm water runoff from surrounding areas.

2.2 Site History and Development

An understanding of the history of the area is necessary to understand the distribution of cadmium at the site. This section provides relevant historical information in four subsections for ease of presentation (Electronics Park Development; History of Surrounding Area; Bloody Brook Location History; and Bloody Brook Drainage District).

2.2.1 Electronics Park Development

In August 1944, General Electric Company (GE) began construction of the Electronics Park facility on 180 acres of farm land in Liverpool, New York. Building EP-7 was the first building completed in April 1947. The remaining buildings in the original complex were completed by mid-1948. In 1993, Martin Marietta Corporation acquired GE's Aerospace business, including the Electronics Park facility. In 1995, Martin Marietta Corporation merged with Lockheed Corporation to form Lockheed Martin. From the construction of the Electronics Park facility to the present, operations at the facility were continuous.

On September 27, 1996, Lockheed Martin transferred ownership of the Electronics Park land and buildings to the Empire State Development Corporation (ESDC). ESDC then established the Electronics Business Park and leased the land and nine of the buildings to the local economic development agency, CEO-Centerstate Corporation for Economic Opportunity (previously named Metropolitan Development Association). At this time, Lockheed Martin is the largest tenant at the Electronics Business Park. The property is currently managed by Electronics Park, LLC.

2.2.2 History of Surrounding Area

The information presented in this section was obtained from the following sources: historical maps; aerial photographs; publicly available government resources; title information; and local historical societies.

The site has been divided into four distinct areas, based on land use, including a wooded area, a residential area, an apartment complex area, and a commercial/light industrial area. In addition to these areas, the Thruway borders the northern edge of the site. The Thruway is not part of the site; however, the history of its construction provides insight into the history of the site. A map illustrating the location of these areas within the site is included as Figure 2. Aerial photographs that were used in this summary are provided as Appendix C.

2.2.2.1 New York State Thruway

The WBBB is directed through culverts that begin north of Electronics Park and convey it beneath Electronics Park and the Thruway. According to the New York State Thruway Authority, construction began on this section of the Thruway on July 11, 1946 and was completed on October 11, 1947. The section of the Thruway from Westmoreland, New York to Rochester, New York, which includes the portion that borders the northern edge of the site, was opened in 1954.

2.2.2.2 Wooded Area

In 1938, the wooded area as well as the Electronics Park facility and the remainder of the site appear to have been farm land. Two agricultural fields were present on either side of the WBBB where the residential development is currently located. A dirt road can be seen connecting these fields and passing over the WBBB.

In 1951, following the construction of the Thruway and the Electronics Park facility, the agricultural fields and the road connecting them were no longer present. A culvert had been installed, allowing surface water within the WBBB to flow underneath the Thruway. It appears that the culvert was installed slightly west of the former channel location. A drainage swale installed during the construction of the Thruway ran along the southern side of the Thruway, apparently directing flow easterly and connecting with the main channel of the WBBB near the discharge end of the culvert. According to deed records, ownership of the wooded area was transferred to the Town of Salina in 1968.

2.2.2.3 Residential Area

Development of the residential area surrounding the WBBB appears to have been completed between 1951 and 1972. The culverts directing flow underneath Sunflower Drive and Brookview Lane appear to have been installed between 1951 and 1959. The culvert directing flow beneath Floradale Road appears to have been installed between 1959 and 1966. The homes along the WBBB appear to have been constructed as follows:

- Homes on the east side of the WBBB (excluding Floradale Road) were completed between 1951 and 1966;
- Homes on the west side of the WBBB south of the wooded area (excluding Floradale Road) were completed between 1959 and 1967;
- Homes along Floradale Road were completed between 1966 and 1972; and
- Homes on the west side of the wooded area were completed between 1959 and 1978.

Aerial photographs (Appendix C) and observations of site conditions indicate that a substantial amount of filling (approximately 3 to 15 feet) and grading was conducted during the construction of these residential areas. Furthermore, the United States Department of Agriculture Soil Survey for Onondaga County references a "Cut and Fill area" (USDA, 1977) in this area. Cut and Fill

refers to a construction process used to remove soil from higher elevations and placing it at lower elevations of an area and is used to properly slope or grade an area.

2.2.2.4 Apartment Complex

In 1938, there are several buildings on either side of Old Liverpool Road in this area. Clearing for the apartment complex occurred between 1959 and 1966. The apartment complex was constructed between 1967 and 1972.

2.2.2.5 Commercial/Light Industrial Area

The commercial/light industrial area mostly consists of three large properties described in this section. The building currently on the property zoned as light industrial located along Old Liverpool Road was constructed between 1981 and 1988. Based upon aerial photographs and a newspaper article announcing the start of construction activities, the former Lakeshore Drive-In Theater was constructed between 1956 and 1959. Based upon observations in the field and the newspaper article, a significant amount of fill material (approximately 4 to 9 feet) was imported in order to raise the level of the land for the construction. The source of this fill material is unknown. The drive-in theater operated until it was closed in 1990. Shortly thereafter, the theater was demolished, and the strip mall currently present on the property was constructed. The Liverpool Pump Station located between the railroad tracks and Onondaga Lake Parkway was constructed in 1960. The original pump station was expanded by addition of a holding tank between 1984 and 1988 and again in 2005 by the addition of a second, larger holding tank located on the north side of the railroad track across from the former drive-in theater.

2.2.3 Bloody Brook Location History

The approximate original course of the WBBB and Bloody Brook (1947 brook centerline) is illustrated on Figure 3. The original course of the WBBB and Bloody Brook was derived based upon interpretation of data obtained from historical topographic maps, historical aerial photographs, and site data (soil classification and soil sample analytical data). Five major modifications were made to the path of the brook channel during the development of the surrounding areas.

2.2.4 Bloody Brook Drainage District

Development in the vicinity of the WBBB occurred at an exceptionally fast rate during the 1950s and 1960s. By the late 1960s, the flood capacity of the WBBB had been far exceeded by the amount of new storm water drainage resulting from development in the area. In response to the flooding, Onondaga County commissioned Calocerinos & Spina Consulting Engineers of Syracuse, New York to perform a drainage basin study (*Bloody Brook Drainage Basin Study*, January 1972) for the entire Bloody Brook, including the WBBB. The purpose of the study was to present the current conditions of the drainage basin and to evaluate options and identify a means to improve conditions in the future. The report recommended the formation of the Bloody Brook Drainage District (Drainage District). The Drainage District included all branches of Bloody Brook and formed a funding mechanism under which Onondaga County could complete various improvements and maintain the drainage capacity of Bloody Brook. Following the establishment of the Drainage District, permanent rights-of-way and easements were obtained by Onondaga County from adjacent land owners. The Drainage District easement was thereby established allowing Onondaga County personnel access to Bloody Brook for various projects. The Drainage District easement within the site is illustrated on Figure 3.

Since the formation of the Drainage District, Onondaga County has funded several projects designed to improve and maintain drainage. These projects have ranged from installing erosion controls (flagstone, concrete, gabion baskets, etc.), to minor channel relocations, to reshaping of channel side banks, and installation and replacement of culverts. In addition to these projects, Onondaga County has periodically removed sediment deposits from the stream to maintain

drainage capacity. These deposits typically accumulate around the culverts at the road crossings. According to discussions with Onondaga County officials, the removed sediments were typically placed within the Drainage District easement. Reportedly, Onondaga County personnel were instructed to discontinue this practice after cadmium was found in the sediments of the stream and in the adjacent soils.

2.3 **Current Physical Setting and Land Use**

2.3.1 West Branch of Bloody Brook and Bloody Brook

The WBBB is relatively small in the upper section near the Thruway (approximately 4 to 6 feet wide, 1 to 2 feet deep) and increases in size (approximately 10 to 15 feet wide, 2 to 4 feet deep) closer to Onondaga Lake Parkway. Bloody Brook south of the Thruway is located within segments of property owned by the Town of Salina, various private owners, and Onondaga County. The bottom of the stream is a clay substrate which had some overlying non-cohesive sediments that accumulated through natural brook flow since the 1997 sediment removal project was completed. The stream is primarily used for storm water management and is included in the Drainage District. The stream located within the site is described in more detail below.

2.3.2 Wooded Area

This portion of the site extends approximately 1,050 feet south and downstream of the Thruway and is undeveloped and difficult to access. This area is approximately 6.25 acres, is irregularly shaped and relatively wide (i.e., greater than 150 feet). The east side of the WBBB has relatively steep slopes along wooded areas leading to residential properties. The west bank has a gentler slope along wooded and brush-vegetated areas leading to residential properties. The presence of fences on residential properties, steep slopes leading to the WBBB, dense vegetation, and wetlands limits access to this area. The wooded area is entirely within the Drainage District easement and is owned by the Town of Salina. Storm water drainage from the surrounding development enters the WBBB from the west via a drainage channel at the southern end of the wooded area.

2.3.3 Residential Area

The residential area surrounds the wooded area commencing at the Thruway and extends along the WBBB to the downstream side of Floradale Road. The portion of the residential area that is directly adjacent to the WBBB (from the southern end of the wooded area to the downstream side of Floradale Road) is approximately 1,300 feet in length. In this area, the WBBB is located within the Drainage District easement on property owned by the Town of Salina and Onondaga County. The Drainage District easement is typically 40 feet wide in this area and is maintained (i.e., mowed) by Onondaga County. This portion of the WBBB has been significantly modified to increase storm water capacity and to reduce erosion. Box culverts, installed in 2015, transmit the WBBB beneath the road crossing at Brookview Lane, Sunflower Drive, and Floradale Road.

In the residential area, residential properties abut the Drainage District easement. Many of these residences have fences installed on their properties which limit access and separate the Drainage District easement from the residential properties.

2.3.4 Apartment Complex Area

The apartment complex is located on Pearl Street and Town Gardens Drive between the residential properties along Floradale Road and the commercial properties along Old Liverpool Road. The apartment complex borders approximately 1,100 feet along the WBBB. The Drainage District easement is typically 40 feet wide and is maintained (e.g., mowed) by Onondaga County.

A double barrel culvert transmits the WBBB under a paved apartment parking area at Pearl Street, and a triple barrel culvert transmits the WBBB beneath the road crossing at Town Gardens Drive. In 2016 the corrugated culvert barrels were lined as an improvement project in coordination with Onondaga County.

Upstream of the Pearl Street culverts, commercially-landscaped and paved parking areas abut the Drainage District easement on both sides of the WBBB. Downstream of the Pearl Street culverts, the apartment complex borders the east side of the WBBB. Commercially landscaped areas abut the Drainage District easement. The confluence of the West and Middle Branches of Bloody Brook, creating Bloody Brook, occurs approximately 200 feet upstream of Old Liverpool Road.

2.3.5 Commercial/Light Industrial Area

The commercial/light industrial area consists of portions of the commercial properties that are adjacent to the WBBB and Bloody Brook and located on Old Liverpool Road and Onondaga Lake Parkway. The Drainage District easement varies between 40 and 60 feet wide in this area. A combination box and double barrel culvert system transmit Bloody Brook beneath the road crossing at Old Liverpool Road. A triple barrel culvert transmits Bloody Brook beneath the railroad bed that lies between Old Liverpool Road and Onondaga Lake Parkway.

Between the Pearl Street and Town Gardens Drive culverts, along the back side of the commercial properties located on Old Liverpool Road, commercially-landscaped and paved parking areas abut the Drainage District easement on the west side of the WBBB. Between the confluence with the Middle Branch of Bloody Brook and Old Liverpool Road, commercially-landscaped areas abut the Drainage District easement on both sides of Bloody Brook.

Upstream of the railroad crossing, the abutting land uses include a commercial office building on the east side and a retail strip mall to the west. West of Bloody Brook upstream of the railroad crossing (the former Lakeshore Drive-In Theater), there was visible evidence of non-site-related filling and disposal activities. Material observed in this area includes construction and demolition debris. The area east of Bloody Brook and upstream of the railroad crossing is isolated and relatively inaccessible.

Downstream of the railroad crossing, an unnamed tributary joins Bloody Brook from the west near Onondaga Lake Parkway. Periodic overflows from the Liverpool Pump Station are directed to this tributary. The area east of Bloody Brook is a mix of wooded and landscaped park areas (near Onondaga Lake Parkway).

2.4 **Geology and Hydrogeology**

General characterization observations of the soil remaining at the site obtained during sampling investigations are included in Tables 2A through 2D. The general profile from top down consists of a sand and silt mixture, followed by a dense clay and/or glacial till. The elevation of the clay/till appears to generally remain constant with the thickness of the overlying silt/sand varying as surface elevations fluctuate. The location of the former brook channel was typically confirmed by the presence of an organic layer. The composition of the organic layer varied and was generally characterized by the presence of root structures in some locations and highly organic black peat in other locations. This organic layer varied in thickness from less than 1 inch to up to 3 feet. Small scale variations (i.e., thin layers of soil not representative of this generalized profile) could be seen in several locations. The presence of substantial amounts of imported fill material including construction and demolition debris at the former Lakeshore Drive-In Theater and the presence of sand/shell mixtures at the southern end of the site near Onondaga Lake Parkway were noted.

A shallow water bearing zone was noted within the silty sands at the site during the soil sampling investigations. The depth to water in this zone varies depending upon surface elevation. The

clay/till layer acts as an aquitard. In accordance with the NYSDEC and United States Army Corp of Engineers permitting for the remediation construction activities in the WBBB and its floodplain, the stream habitat of WBBB was upgraded by constructing 1.31 acres of replacement wetland habitat. During the May 2017 inspection, a total of 1.57 acres of wetland were found. Thus, an excess of 0.26 acres of wetlands currently occupy the site in the wooded area.

2.5 **Investigation and Remedial History**

Cadmium is a naturally occurring metallic element that is present throughout the environment in soil, plants, and animals. Cadmium has many uses in industry and is found in consumer products such as an ingredient in batteries, paint, metal coatings and plastics. Lockheed Martin examined records relating to historic manufacturing processes at the Electronics Park facility positioned upstream from the portion of the West Branch of Bloody Brook located within the site. These records show that cadmium was historically used at the Electronics Park facility, but no evidence was found of a cadmium release. While a direct connection between site conditions and the Electronics Park facility could not be identified, Lockheed Martin agreed to investigate and remediate the site under the New York State Voluntary Cleanup Program.

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

2.5.1 Sampling and Remedial History

Various investigations other than soil sampling have been completed at the site. Those investigations including biota, surface water, and sediment sampling along the WBBB and Bloody Brook have been performed by NYSDEC, Lockheed Martin, and Onondaga County from September 1994 through January 2008. Investigations of water quality and biota within the WBBB were initiated by NYSDEC in September 1994 (NYSDEC, 1996). In April 1996, NYSDEC shared the results of the 1994 investigations with Lockheed Martin. Lockheed Martin conducted sediment and surface water sampling from May 1996 through May 1999 and additional sediment sampling in January 2008 in support of the 2008 Interim Remedial Measure (IRM). In addition to the biota, surface water, and sediment investigations, Lockheed Martin conducted soil sampling from November 2001 through September 2015. Lockheed Martin undertook these site investigations pursuant to a series of work plans approved by NYSDEC.

As requested by NYSDEC, early studies typically focused on PCBs, cadmium, copper, and mercury. In 1997 under NYSDEC oversight, Lockheed Martin removed all sediments from within the 200-foot long culvert beneath the Thruway and the adjacent downstream 750-foot segment of the WBBB (BBL, 1997). In January 1997, NYSDEC concluded that the concentrations of cadmium were elevated in the WBBB sediments, and PCBs, copper, and mercury did not pose a concern (NYSDEC, 1997). In 1999, a specific set of sediment samples was collected and analyzed for a more comprehensive list of organic and inorganic constituents. The results of the comprehensive analyses supported NYSDEC focus on cadmium, which became the constituent of potential concern (COPC) for the site.

Below is a summary of the sampling and remedial activities that were completed at the site.

2.5.1.1 Biota, Surface Water, and Sediment Sampling

Various biota, surface water, and sediment sampling activities have been conducted at the site since 1994 as described below:

- In September 1994, crayfish samples were collected by NYSDEC from locations along Bloody Brook and analyzed for inorganic compounds and PCBs.

- From October 1995 to May 2000, Lockheed Martin and NYSDEC collected surface water samples from various locations along Bloody Brook. Analytes included inorganic compounds and PCBs.
- From May 1996 to May 1999, Lockheed Martin and NYSDEC collected sediment samples within Bloody Brook. Samples were collected for various analyses including inorganic compounds, PCBs, total organic carbon, total petroleum hydrocarbons, volatile and semi volatile organic compounds, pesticides, and herbicides.
- In January 2008, Lockheed Martin collected five sediment samples from culverts along the WBBB to support the IRM. These samples were analyzed for Resource Conservation and Recovery Act characteristics and PCBs.
- In summer 2014 and 2018, samples were collected from the brook for biological monitoring. The 2014 samples serve as the pre-remediation baseline results, and 2018 was the first year of biological monitoring following completion of the remedy. The next biological monitoring event is planned for summer 2020, as will be discussed in more detail in following sections.

2.5.1.2 Soil Sampling and Remedial History

Soil sampling and remedial activities have been conducted at the site since 1996 as summarized below:

- In October 1996, Onondaga County collected five soil samples, from 0- to 6-inches in depth, in conjunction with the installation of the gabions north of Brookview Lane (OCDDS-4, OCDDS-5, OCDDS-6, OCDDS-7, and OCDDS-10).
- As described in the *West Branch of Bloody Brook Sediment Removal Certification Report* (BBL, 1997), in April 1997, Lockheed Martin collected two soil samples (Pre-SS-P1 and Post-SS-P1) from the area within the easement which was used to construct a stockpile area for sediment being removed during the 1997 sediment removal project.
- In 1997, under NYSDEC oversight, Lockheed Martin completed a project to remove all sediments from within the 200-foot long culvert beneath the Thruway and the adjacent downstream 750-foot segment of the WBBB. This removal addressed elevated concentrations of cadmium and polychlorinated biphenyls (PCBs) in this segment of the WBBB. The removed material was transported off site to Seneca Meadows Landfill located in Waterloo, New York (a New York State permitted landfill). Subsequent sediment sampling and analyses indicated that PCBs were not of concern in the brook channel downstream of this segment.
- In October 2001, NYSDEC collected two soil samples (EPSOIL-2 and EPSOIL-3) between the Thruway and the confluence of the West and Middle Branches: one sample upstream of Electronics Park on the WBBB (EPSOIL-1), and one downstream of the railroad tracks below the confluence of the West and Middle Branches of Bloody Brook (EPSOIL-4). These samples were collected within the 0- to 12-inch depth interval. Additionally, NYSDEC has periodically split samples collected by Lockheed Martin during later sampling events (described below).
- In November 2001, Lockheed Martin collected soil samples from 12 locations between the Thruway and the confluence of the West and Middle Branches (SB-01 through SB-12). Additionally, Lockheed Martin collected soil samples at six other locations downstream of the confluence of the West and Middle Branches (SB-13 through SB-18). These samples were collected from within the 0- to 12-inch depth interval and, where possible, between the 12- and 24-inch depth interval.
- In June 2002, Lockheed Martin collected shallow soil samples from 32 locations from 0- to 2-inches in depth between the Thruway and the confluence of the West and Middle Branches (SB-19 through SB-50). These samples were collected in accordance with NYSDEC-approved *Shallow Side Bank Surface Soil Sampling and Analysis Work Plan* (IT Corporation, 2002).

- In November 2002, Lockheed Martin collected soil samples from 48 locations (SB-51 through SB-85 and SB-201 through SB-215). Sampling depths ranged from surface samples (0- to 2-inches) to 12 feet below ground surface (bgs). A total of 181 samples were collected. These samples were collected in accordance with NYSDEC-approved *Phase III Side Bank Soil Investigation Work Plan* (Shaw, 2002).
- In October and November 2003, Lockheed Martin collected soil samples from 82 locations. Sampling depths ranged from surface samples (0- to 2-inches) to 16 feet bgs. A total of 731 soil samples were collected. These samples were collected in accordance with NYSDEC-approved *Phase IV Side Bank Soil Investigation Work Plan* (Shaw, 2003).
- In November 2003, Onondaga County collected 20 soil samples from 10 locations as part of the Liverpool Pump Station Improvement Project. Samples were collected at various depths.
- In April 2004, Lockheed Martin collected soil samples from 26 locations (borings SB-435 through SB-459 and SD-31). Sampling depths ranged from surface samples (0- to 2-inches) to 11.5 feet bgs. A total of 124 soil samples were collected. These samples were collected in accordance with NYSDEC-approved *Phase IV-A Side Bank Soil Investigation Work Plan* (Shaw, 2004).
- In December 2007, Lockheed Martin collected soil samples from five locations in the area between the existing WBBB channel and the former brook channel (borings SSSWP-1 through SSSWP-5). A single 2-foot core was collected from each of the five locations, and the cores were sampled from the 0- to 6-inch and 6- to 24-inch depth increments. These samples were collected in accordance with NYSDEC-approved *Supplemental Soil Sampling Work Plan* (ARCADIS BBL, 2007).
- Lockheed Martin conducted sediment removal from within the Brookview Lane, Sunflower Drive, Floradale Road, and Pearl Street culverts in 2008 as a NYSDEC-approved IRM. This work was completed at the request of the Onondaga County to increase the hydraulic capacity of the drainage system in the area. Approximately 91 tons of sediment were removed from the IRM project area (nine truckloads). The excavated sediment was transported off site to the Waste Management High Acres Landfill in Fairport, New York (a New York State permitted landfill).
- In August and September 2009, Lockheed Martin collected and analyzed 75 soil samples from 16 locations to support an Onondaga County Department of Water Environment Protection (OCDWEP) storm water drainage improvement project. Sampling depths ranged from 1 foot to 11 feet bgs. After reviewing the analytical results with NYSDEC and NYSDOH, Lockheed Martin removed and disposed of off-site at a permitted landfill approximately 1 cubic yard of soil from locations containing cadmium concentrations above 10 mg/kg in the top 4 feet in residential areas and in the top 2 feet in the Drainage District easement. The soil removal allowed for the installation of a drainage line needed to complete the storm water upgrades. The sampling and removal activities were completed in accordance with NYSDEC-approved work plans written for individual properties and are summarized in the report titled *OCDWEP Storm Water Drainage Improvement Project Soil Sampling Test Results* (Shaw, 2009b).
- In April, May, and August 2011, Lockheed Martin collected soil samples from 164 locations. Sampling depths ranged from 6 inches to 16 feet bgs. A total of 773 soil samples were collected, and 525 soil samples were analyzed. Those samples were collected in accordance with NYSDEC-approved *Design Soil Investigation Work Plan* (Shaw, 2011).
- Between 2013 and 2015, Lockheed Martin collected several additional soil samples on private properties as part of a pre-design investigation to further characterize the extent of cadmium distribution and to establish the excavation limits. Samples were also collected from soil borings in the roadways adjacent to the culverts crossing Brookview Lane, Sunflower Drive, Floradale Road, Pearl Street, and Town Gardens Drive.
- Between 2014 and 2017, remedial construction activities were completed for the site in accordance with the 2014 Decision Document, the 2013 *Remedial Action Work Plan* (RAWP) (AECOM, 2013), and subsequent annual Construction Work Plans. A 2018 Final Engineering Report (FER) documents the site's completed remedial actions.

Prior to site remediation, concentrations of cadmium detected in soil samples at the site varied from below laboratory detection limits to 5,350 mg/kg. The depth to the observed cadmium ranged from at the surface to 14 feet bgs. Cadmium concentrations were, in general, significantly higher on the northern portion of the site and decrease substantially towards the south end of the site.

Soil analytical results for soils remaining on the site post-remediation are summarized in Tables 2A, 2B, 2C, and 2D, and soil sample locations are shown on Figures 3A, 3B, and 3C. The "Figure Coordinate" column in the tables corresponds to the grid system shown on the figures.

2.5.2 Mobility and Distribution of Cadmium

This section presents a discussion on the fate and transport (mobility) of cadmium as well as an overview of the mechanisms affecting the cadmium distribution at the site.

Cadmium within soil buried below the ground surface adjacent to the stream is not mobile due to its chemical and physical characteristics. According to the Agency for Toxic Substances and Disease Registry (ATSDR), the general mobility and partitioning of cadmium among media (i.e., movement from soil to groundwater or surface water or the reverse) is dependent on physical and chemical factors within the environment. Two site factors that reduce the mobility of cadmium in soil are pH and organic matter content. Cadmium adsorption in soil generally increases with higher pH, and the presence of organic matter leads cadmium to form insoluble complexes (ATSDR, 1999).

The pH in the vicinity of the stream is elevated partly because bedrock at the site is dominated by carbonate minerals. These minerals act to neutralize acidic water and raise the pH of area groundwater and surface water. The measured pH in the surface water of the brook averages around 8.0. In addition, soil in the vicinity of the former brook channel, which has the highest cadmium concentrations, contains a high organic fraction, and in some cases is characterized as peat. The highly organic soil, combined with elevated pH, binds the cadmium to the soil and reduces its mobility in the subsurface.

In the aquatic environment, adsorption of cadmium by humic substances and other organic complexing agents plays a dominant role in transport and partitioning (ATSDR, 1999). As evidenced by sampling data from the site, cadmium precipitation and sorption to mineral surfaces and organic materials account for the lack of dissolved cadmium in the water column, thus water media were not further considered for the site.

Three primary mechanisms appear to have contributed to the distribution of cadmium observed within the soil adjacent to the stream. These mechanisms include the natural sediment movement within the stream channel, relocation of portions of the WBBB and Bloody Brook, and maintenance activities conducted on the brook.

The first mechanism influencing soil adjacent to the stream relates to the natural movement of cadmium adsorbed to sediment and soil by erosion and sedimentation. Natural flow within a water body will result in the erosion and deposition of sediments, including areas along and on top of the channel side banks during high flow events. After defining the historical course of the stream, the side banks of the original brook channel found in the northern portion of the site appeared to have been shallow allowing the brook to overflow the historical channel and create a wide floodplain where eroded sediment was deposited during periods of high flow. The mechanism of erosion and sedimentation along with the shape and size of the historical brook channel explains why higher cadmium concentrations are found in the northern portion of the site. Along the southern portions of the brook, the erosion control measures implemented to minimize movement of sediment reduced the area of the floodplain and deposition of cadmium.

The second mechanism is a series of stream relocations that were made to the brook channel beginning in the 1940s and proceeding into the 1970s. The distribution of cadmium follows the

location of the former brook channel and its floodplain. These floodplain deposits were covered with soil/fill during the process of development, at depths of up to 15 feet bgs.

The third mechanism influencing soil adjacent to the stream relates to maintenance activities in the stream. Reportedly, sediments containing cadmium were periodically removed from the stream and placed on the adjacent banks during the installation of erosion controls and maintenance activities conducted to maintain the drainage capacity of the stream.

2.6 **Remedial Action Objectives**

The Remedial Action Objectives (RAOs) for the site as listed in the 2014 Decision Document are as follows for soil and sediment.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Sediment

RAOs for Public Health Protection

- Prevent direct contact with contaminated sediments.

RAOs for Environmental Protection

- Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain.
- Restore sediments to pre-release/background conditions to the extent feasible.

2.7 **Excavation of Contaminated Soil and Sediment**

Per the 2014 Decision Document and to address the site RAOs, excavation and off-site disposal of contaminated soil and sediment included the following:

- all sediment from the WBBB and Bloody Brook from below the confluence of the West and Middle Branches of Bloody Brook, between the New York State Thruway and the Onondaga Lake Parkway;
- top two feet of side bank soil from the WBBB and Bloody Brook, from below the confluence of the West and Middle Branches of Bloody Brook, between the New York State Thruway and Old Liverpool Road;
- side bank soil from Bloody Brook between Old Liverpool Road and the Onondaga Lake Parkway with known cadmium concentrations greater than 4 mg/kg in the top two feet;
- the wooded/wetland area: soils in the top two feet with known cadmium concentrations greater than 4 mg/kg, and soils from two to six feet below grade with known cadmium concentrations greater than 100 mg/kg;

- residential properties: soils in the top two feet with known cadmium concentrations greater than 2.5 mg/kg, and soils from two to four feet below grade with known cadmium concentrations greater than 10 mg/kg;
- apartment complex area: soils in the top two feet with known cadmium concentrations greater than 4.3 mg/kg and soils from two to four feet below grade with known cadmium concentrations greater than 10 mg/kg;
- Drainage District easement: soils in the top two feet with known cadmium concentrations greater than 10 mg/kg; and
- former drive-in theater area: soils in the top two feet with known cadmium concentrations greater than 9.3 mg/kg where surface disposal of brook dredge spoils had previously occurred.

2.8 **Remaining Soil Contamination**

Analytical results for soil remaining on the site post-remediation are summarized in Tables 2A, 2B, 2C, and 2D, and soil sample locations are shown on Figures 3A, 3B, and 3C. The "Figure Coordinate" column in the tables corresponds to the grid system shown on the figures. Samples indicating the presence of residual cadmium, as defined below for the different site areas and land uses, are also identified in these tables and figures.

- Residential areas– 10 mg/kg for depths greater than 2 feet.
- Wooded area and sidebanks between Old Liverpool Road and Onondaga Lake Parkway (sidebanks being the top of rip rap) – 4 mg/kg in the top 2 feet and 10 mg/kg greater than 2 feet.
- Apartment complex property – 10 mg/kg greater than 2 feet.
- Commercial properties – 9.3 mg/kg in the top 2 feet and 10 mg/kg greater than 2 feet.
- Drainage District easement (including CSX property) – 10 mg/kg for depths greater than 2 feet.

3 Institutional and Engineering Control Plan

3.1 General

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

This plan provides:

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

3.2 Institutional Controls

A series of ICs is required by the 2014 Decision Document to: (1) implement, maintain and monitor EC systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the site to appropriate uses for each area. Adherence to these ICs on the site is required by the 2014 Decision Document and will be implemented under this SMP. The IC boundaries are shown on Figure 4. These ICs include the following:

- All ECs must be maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP.
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the site must be provided to agents, employees, or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the SMP.

Specific ICs as outlined in the 2014 Decision Document include the following:

- a provision for further investigation to refine the extent of contamination in the areas where access was previously hindered (e.g., any residential property where access is currently denied or future excavations that require the property owner to contact Lockheed Martin when digging at depths where residual cadmium has been or has the potential to be detected);

- maintaining site access controls and Department notification;
- tracking of property ownership changes to allow for the continued communication with owners;
- annual notification by Lockheed Martin to property owners of Lockheed Martin's offer to implement the remedy for property owners who chose to decline remedy implementation and/or sampling on their property;
- an annual reminder from Lockheed Martin to property owners with post remedy residual soil contamination of the presence of such residual contamination, and of Lockheed Martin's commitment to handle (excavate, manage and dispose) residual contaminated soils, as necessary and in accordance with the intended use of the property;
- a provision for Lockheed Martin to request that the Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development timely inform Lockheed Martin of any building permits they grant for properties within the site boundaries where residual material remains post remedy. Details of this notification process with the Village of Liverpool and Town of Salina are provided in the following sections; and
- a provision for Lockheed Martin to request that the Town of Salina and Onondaga County timely inform Lockheed Martin of any Town or County plans to conduct intrusive maintenance work within the site boundaries (*e.g.*, soil disturbance work). Details of this notification process are provided in the contract Lockheed Martin entered into with Onondaga County on July 9, 2014 and included as Appendix E.

3.2.1 Institutional Control Notifications

As mentioned above and discussed in more detail in the subsections below, notifications are required as ICs for the site to prevent human and ecological contact with residual cadmium remaining on the site. These notifications are summarized in Table 3, and residual cadmium is defined in Section 2.8 for the different site areas and land uses.

3.2.1.1 Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development

Following initial approval of this SMP in 2018, Lockheed Martin provided the Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development detailed information regarding the locations and depths at which residual cadmium remains at certain properties within the site. The Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development shall timely inform Lockheed Martin of any applications they receive for ground-intrusive building permits for properties within the site that contain residual cadmium. Sufficient notification must be made to Lockheed Martin so they can review the analytical soil data for the property(ies), obtain the appropriate resources to conduct any sampling that may be necessary and, depending on the results, coordinate with the property owner and obtain the resources to assist in the excavation and handling of disturbed soil. No permits shall be issued until Lockheed Martin notifies the Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development of the results of their investigation. If there are no concerns, Lockheed Martin will recommend issuance of the permit with no further involvement. If results indicate elevated levels of cadmium (i.e., above the 2014 Decision Document soil cleanup objectives), Lockheed Martin will recommend issuance of the permit with the condition that Lockheed Martin will coordinate with the property owner to excavate and dispose of soil properly.

Notifications will be made as identified below, and Lockheed Martin will send annual reminder letters of these provisions to the Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development.

- The Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development will notify Lockheed Martin within 7 calendar days of receiving applications for ground-intrusive building permits for properties within the Site that contain residual cadmium. The notification will include detailed information about the location and depth of soil disturbing activities.
- Lockheed Martin will review the analytical data and contact the owner of the property for which the permit is being requested and, if necessary, arrange for samples to be collected within 14 calendar days of the date they were notified by the Town of Salina or Village of Liverpool. Lockheed Martin will simultaneously contact the NYSDEC and NYSDOH and provide updates as activities continue.
- Lockheed Martin will collect soil samples in accordance with the Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP), Appendices F and G, respectively. Samples will be sent to a NYSDOH Environmental Laboratory Accreditation Program (ELAP)-certified laboratory to be analyzed for cadmium and obtain results within 48 hours. Results will be reviewed and Lockheed Martin will report back to the Village of Liverpool Code Enforcement Office and Town of Salina Department of Planning and Development within 7 calendar days from receipt of the results. If soil analytical results indicate no elevated levels of cadmium above the concentrations defined in Section 2.8 for the different site areas and land uses, Lockheed Martin will recommend that the permit be issued.
- If soil analytical results indicate elevated levels of cadmium, Lockheed Martin will recommend issuance of the permit with the condition that Lockheed Martin will excavate and dispose of soil properly. Lockheed Martin will contact the property owner within 48 hours of notifying the Village of Liverpool Code Enforcement Office and Town of Salina Department of Planning and Development of the elevated levels of cadmium. A meeting will be scheduled with the property owner to discuss the soil excavation and disposal at a time and place that is convenient for them.
- Within 14 calendar days of notifying the property owner, Lockheed Martin will begin excavation activities to remove the soil on the property within the permit project area. Excavation activities will be conducted in accordance with the Excavation Work Plan (Attachment D).

Table 4 includes contact information for the above Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

3.2.1.2 Lockheed Martin to Property Owners

Following initial approval of the SMP in 2018, Lockheed mailed annual notices to property owners with post remedy residual soil, as defined in Section 2.8, as a reminder of the presence of residual contamination and of Lockheed Martin's commitment to handle (excavate, manage and dispose) residual contaminated soils, as necessary and in accordance with the intended use of the property. If the remaining residual cadmium is removed from the property, the annual notice letters would no longer be required.

Lockheed will also mail annual notices to property owners who chose to decline remedy implementation and/or sampling on their property with an offer to implement the remedy.

3.2.1.3 Onondaga County

Lockheed Martin entered into a contract with Onondaga County on July 9, 2014 that required the County to inform Lockheed Martin of any Town or County plans to conduct intrusive maintenance work within the site boundaries (*e.g.*, soil disturbance work). If the proposed County work has the potential to disturb residual cadmium, the County will notify and consult with Lockheed Martin with regards to the handling of soils (excavation, management, and disposal) contaminated with

residual cadmium. The terms of this agreement are effective for up to 20 years with the option of extending the agreement. The fully executed agreement is included as Appendix E.

Table 5 includes contact information for the above Onondaga County notifications. The information on this table will be updated as necessary to provide accurate contact information. An annual reminder letter of the provisions of this contract will be sent to Onondaga County. A full listing of site-related contact information is provided in Appendix A.

3.3 **Engineering Controls**

3.3.1 Soil Cover

Exposure to remaining contamination at the site is prevented by a cover system placed over the site in the areas where soil was excavated. This cover system is comprised of a minimum of 24 inches of clean soil and other components as appropriate. Figure 5 presents the location of the soil cover and applicable demarcation layers. The Excavation Work Plan (EWP) provided in Appendix D outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in Appendices H and D.

3.3.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10. The soil cover is a permanent control. The quality and integrity of this cover will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

4 Monitoring and sampling plan

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC. Where applicable, details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management activities are included in the Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP) provided in Appendices F and G, respectively.

This Monitoring and Sampling Plan describes the methods to be used for evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

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

- Annual certification;
- Annual restoration monitoring to be completed for five years;
- Biological monitoring to be completed in 2020.

Reporting requirements are provided in Section 7.0 of this SMP, and Table 6 summarizes the monitoring and inspection schedule for the site.

4.2 Site Inspections

Annual site inspections will be performed by Lockheed Martin. Lockheed Martin will address any erosion issues within the Drainage District annually for five years, after which Onondaga County will resume all maintenance activities within the area including addressing erosion, removing accumulated sediments, and maintaining the integrity of the side banks. These activities will be completed in accordance with the contract that Lockheed Martin has executed with Onondaga County (Appendix E) and summarized in Section 3.

In the commercial and residential areas outside of the easement, vegetative restoration will be monitored annually for between one and five years, pursuant to NYSDEC approved work plans and property-specific access/restoration agreements between Lockheed Martin and the property owner. Effectiveness of the soil cover will be confirmed during the annual site inspections that will continue beyond the vegetation monitoring.

Restoration and site inspections were completed in spring 2017 and 2018 as the first two of these annual inspections, with a Restoration Monitoring Summary Report being submitted to NYSDEC in July 2017 and August 2018. At the time the 2017 inspection was completed, restoration was still in progress at the areas listed below and identified on Figure 2. Consequently, these areas were excluded from this inspection and were monitored for the first time during the annual inspection in 2018.

- Apartment complex area including the stream side banks and bottom
- Portion of the commercial property outside of the stream side banks and located between the Old Liverpool Road culvert and the railroad tracks
- Construction access area at Onondaga Lake Parkway

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 ECs. Inspections completed by Lockheed Martin and any impacts observed by Onondaga County will be included on an inspection form as provided in Appendix I – Site Management Forms. The form will compile sufficient information to assess the following:

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

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report (PRR). The inspections will determine and document the following:

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

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as 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.

4.3 **Post-Remediation Monitoring**

4.3.1 Vegetation Monitoring

Vegetation monitoring will be performed to evaluate the success of the vegetation planting at the Bloody Brook site. Vegetation monitoring for each area (i.e., wooded, residential, apartment complex, and commercial areas) will be completed as described in the Restoration Monitoring Work Plan (included as Appendix J) on an annual basis and will include an on-site inspection to be completed by a qualified person (e.g., biologist). Monitoring will continue for between one and five years, pursuant to approved work plans and property-specific access/restoration agreements between Lockheed Martin and the property owner.

4.3.2 Stream and Side Bank Erosion

In accordance with the 2014 Decision Document, the site will be inspected annually for ponding on the side banks and for erosion of the brook bottom and side banks by Lockheed Martin. This

inspection will be completed as part of the annual site-wide inspection discussed in Section 4.2. A Restoration Monitoring Work Plan is provided as Appendix J.

4.3.3 Biological Monitoring

The objective of the biological monitoring is to document cadmium concentrations in aquatic biota following the completion of the remedial activities at the site. Pre-remedial data, summarized in Table 7, was collected to serve as a baseline data set in 2014. The first year of post-remediation monitoring data, collected in 2018 and provided to NYSDEC in a letter dated October 31, 2018, have indicated the remedy has been effective in mitigating cadmium impacts as can be seen in the declining cadmium concentrations in the biological samples (Table 7). Collectively, these data will be used in part to support the evaluation of the effectiveness of the site remedial program in mitigating potential cadmium impacts to Bloody Brook.

Crayfish are the target organism for this work because they are known to accumulate cadmium, and they are relatively less mobile than other resident aquatic organisms (e.g., fish). Crayfish have been observed in the WBBB and Bloody Brook and have been sampled previously by both NYSDEC and Lockheed Martin.

Crayfish will be collected from three general locations or stations within the brook, including an upper, middle, and lower location, consistent with the locations sampled during the baseline sampling. The crayfish samples will be collected in accordance with the procedures described Appendix F and sent to a laboratory for cadmium analyses.

Sampling was scheduled two and four years following remediation, with the first being completed in 2018 and the next sampling event planned for 2020. Sampling for each event will be completed during the same general time frame to avoid possible seasonal fluctuations in cadmium concentrations. Following the four year sampling event, the data will be evaluated and a determination will be made regarding the necessity for additional monitoring events.

5 Operation and Maintenance Plan

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

6 Periodic Assessments/Evaluations

6.1 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 engineering controls. Vulnerability assessments provide information so that the site is prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding. This section briefly summarizes the vulnerability of the site and/or engineering controls to severe storms/weather events and associated flooding.

Because the site is located within a drainage system with a soil cover as an engineering control, a potential vulnerability to the site includes increased erosion resulting from intensity and severity of storm events that have the potential to cause significant flooding and erosion.

6.2 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 the major green remediation components for the site during site management that will be evaluated and summarized in the Periodic Review Report (PRR). Considering the environmental impacts of remedy stewardship over the long term, the major components are as follows.

- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

6.2.1 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the site, use of consumables in relation to visiting the site in order to complete inspection, monitoring, and maintenance activities, and collecting/shipping samples to a laboratory for analyses all have direct and/or inherent energy costs. The schedule and/or means of these periodic activities will be prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

6.2.2 Metrics and Reporting

While the anticipated site management activities would not require this, if additional soil removal is warranted in the future in accordance with the ICs, information on energy usage, solid waste

generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits.

6.3 **Remedial Site Optimization**

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

- The remedial actions have not met or are not expected to maintain the remedy;
- The management of the remedial site is exceeding the estimated costs;
- The remedy is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Site conditions change due to development, change of use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

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

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

7 Reporting Requirements

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendices I and J. 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 Section 1.3 and summarized in the Periodic Review Report.

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

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc.) if applicable;
- 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;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

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

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

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

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

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

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

7.2 **Periodic Review Report**

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the SMP is approved. After submittal of the initial Periodic Review Report, the next PRR shall be submitted annually 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. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site.
- Results of the required annual site inspections 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 discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.
- A site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the site-specific 2014 Decision Document;
  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and
- Trends in contaminant levels in the brook will be evaluated to determine if the remedy continues to be effective at preventing impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain. This will be achieved with the collection of crayfish samples two and four years following remedy completion.
  - The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a qualified environmental professional will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

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

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program; and*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative] for the site."

7.3 **Corrective Measures Work Plan**

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, 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.

7.4 **Remedial Site Optimization Report**

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

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, Site Control (i.e., Onondaga County and Town of Salina), and the NYSDOH Bureau of Environmental Exposure Investigation.

8 References

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

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Agency for Toxic Substances and Disease Registry (ATSDR), 1999, *Toxicological Profile for Cadmium*.

ARCADIS BBL, 2007, *Supplemental Soil Sampling Work Plan*.

BBL, 1997. *West Branch of Bloody Brook Sediment Removal Certification Report*, November.

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NYSDEC, 1996, Memorandum from Robert Bode to Distribution regarding Bloody Brook Tissue Analysis Results, January.

NYSDEC, 1997, *Statement of Basis for Lockheed Martin Corporation Electronics Park Facility*, January.

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Shaw, 2009b, *OCDWEP Storm Water Drainage Improvement Project Soil Sampling Test Results*, December.

Shaw, 2011, *Design Soil Investigation Work Plan*, February

United States Department of Agriculture (USDA), 1977, *United States Department of Agriculture Soil Survey for Onondaga County*, January.

TABLES

Table 1
Bloody Brook
Regulator Notifications

Name	Contact Information
NYSDEC Project Manager Jacky Luo	518-402-9676 jacky.luo@dec.ny.gov
NYSDOH Project Manager Mark Sergott, P.G.	518-402-7860 beei@health.ny.gov

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

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-01-01	G9	0' - 1'	5/2/2011	0.15 J	Sandy silt, organics and wood
		1' - 2'		0.059 J [0.19 J]	Sandy silt
		2' - 3'		0.11 J	Sandy silt
		3' - 4'		0.047 J	Sandy silt
		4' - 5'		0.11 J	Sandy silt
		5' - 6'		0.060 J	Sandy silt
		6' - 7'		0.19 J	Silty sand with little clay, Sandy silt with organics at 6'-8"
		7' - 8'		0.079 J	Silt with little clay
		8' - 9'		3.1	Grades to fine sand, little silt, silt with organics at 8'-10"
		9' - 10'		2,450	Organics with some silt, trace sand, trace clay
		10' - 11'		2.6	Grades to fine sand with white crystals, little silt
		11' - 12'		0.49 B	Medium to fine sand
		12' - 13'		13.8	Medium to fine sand
DI-01-02	G9	8' - 9'	4/27/2011	0.40	Silty clay
		9' - 10'		0.12 J	Silty clay
		10' - 11'		0.26	Sandy silt, little clay at 10'-2"
		11' - 12'		12.9	Sandy silt, little clay, organics
		12' - 13'		1.1	Silty clay
		13' - 14'		2.8	Silty clay
		14' - 15'		18.8	Silty clay, organics
DI-02-01	E9	2' - 3'	4/27/2011	0.21 J	Clayey silt, silty clay
		3' - 4'		0.13 J	Clayey silt, sandy silt
		4' - 5'		0.16 J	Sandy silt, clayey silt
		5' - 6'		1.1	Clayey silt, sandy silt, silt
		6' - 7'		2.9	Sandy silt, silt, clayey silt
		7' - 8'		0.49	Silty clay, clay, sandy silt, silty sand, organics
		8' - 9'		0.47 B	Till
		9' - 10'		0.27 B	Till
DI-02-02	E9	0' - 1'	4/27/2011	0.80	Clayey silt, silt
		1' - 2'		0.070 J	Clayey silt
DI-03-01	D12	0' - 1'	4/27/2011	0.45 B	Silt, little fine sand, trace clay
		1' - 2'		<0.26 U	Silt, little fine sand, trace clay
		2' - 3'		<0.25 U	Silt, little fine sand, trace clay
		3' - 4'		<0.24 U	Clayey silt
		4' - 5'		<0.23 U	Clayey silt
		5' - 6'		<0.25 U	Clayey silt
		6' - 7'		<0.26 U	Clayey silt
		7' - 8'		0.096 J	Clayey silt
DI-03-02	C12	0' - 1'	4/27/2011	0.23 J	Silt with little fine sand, trace gravel
		1' - 2'		0.17 J	Silt, trace clay
		2' - 3'		0.15 J	Silt, trace clay
		3' - 4'		0.16 J	Silt, some clay
		4' - 5'		0.25 J	Silty clay
		5' - 6'		<0.25 U	Silty clay
		6' - 7'		<0.23 U	Silty clay
		7' - 8'		<0.24 U	Silty clay
		8' - 9'		<0.22 U	Silt

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-03-03	C12	0' - 1'	4/27/2011	0.18 J	Sandy gravel, organics, little silt
		1' - 2'		0.067 J	Medium to fine sand with little silt, trace gravel
		2' - 3'		0.068 J	Silty clay
		3' - 4'		<0.24	Silty clay
		4' - 5'		0.057 J	Medium to fine sand with trace gravel, trace silt
		5' - 6'		0.048 J	Silty clay, trace gravel at 5'-7"
		6' - 7'		0.084 J	Clayey silt
		7' - 8'		0.063 J	Clayey silt
		8' - 9'		1.3	Clay with some silt
		9' - 10'		170	Clay with some silt
DI-03-04	C12	0' - 1'	4/27/2011	0.28	Sandy gravel, trace silt, organics
		1' - 2'		0.23	Sandy gravel, some silt
		2' - 3'		0.31	Coarse to fine sand, trace gravel, trace silt
		3' - 4'		0.25	Coarse to fine sand, trace gravel, trace silt
		4' - 5'		0.13 J	Sandy gravel, trace silt
		5' - 6'		0.29	Clayey silt and debris at 5'-7"
DI-03-05	C12	0' - 1'	4/27/2011	0.33	Medium gravel, coarse to fine sand, trace silt
		1' - 2'		0.30	Medium gravel, coarse to fine sand, trace silt
		2' - 3'		0.27	Medium gravel, coarse to fine sand, trace silt
		3' - 4'		0.31	Medium gravel, coarse to fine sand, some silt
		4' - 5'		0.11 J	Medium gravel, coarse to fine sand, some silt
		5' - 6'		0.12 J	Silt, fine sand, trace clay
		6' - 7'		0.15 J	Silt, fine sand, trace clay
		7' - 8'		0.14 J	Silt, fine sand, trace clay
		8' - 9'		0.074 J	Fine to coarse sand, trace silt at 8'-3"
		9' - 10'		0.15 J	Sandy gravel, little silt, Silty sand at 9'-8"
		10' - 11'		267	Silty clay with organics
		11' - 12'		5.9	Silty clay with organics, strong odor
DI-17-01	D13	0' - 1'	5/2/2011	0.43	Silty sand, sandy silt, roots
		1' - 2'		0.15 J	Sandy silt, clayey silt
		2' - 3'		0.057 J	Sandy silt
		3' - 4'		0.048 J	Sandy silt, clayey silt
		4' - 5'		0.090 J	Silt, sandy silt
		5' - 6'		161	Silt, clayey silt, organics
		6' - 7'		0.38 B	Sandy silt
		7' - 8'		<0.31 U	Sandy silt, silt
		8' - 9'		0.46 B	Sandy silt, clayey silt
DI-17-02	D13	4' - 5'	5/2/2011	0.33	Sandy silt
		5' - 6'		1.2	Sandy silt with little clay
		6' - 7'		0.37	Clayey silt with little fine sand
DI-19-01	E4	2' - 3'	5/3/2011	14.9 B	Sandy silt, silt, clayey silt, gravel
		3' - 4'		1.0 B	Sandy silt, gravels, clayey silt
DI-19-02	E4	2' - 3'	5/3/2011	2.6	Sandy silt, silt
		3' - 4'		2.9	Sandy silt, clayey silt, silt
DI-20-01	F5	2' - 3'	5/3/2011	2.6 B	Sandy silt, silt, roots
		3' - 4'		0.52 B	Clayey silt, sandy silt, silt, gravel
DI-21-01	F9	0' - 1'	4/29/2011	0.83	Silty sand, organics
		1' - 2'		0.33	Silty sand, organics
		2' - 3'		0.097 J	Silty sand
		3' - 4'		0.042 J	Silty sand

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-22-01	F10	0' - 1'	4/29/2011	0.73	Silty sand, trace clay
		1' - 2'		0.19 J	Sandy silt, silty sand
		2' - 3'		0.14 J	Sandy silt, silty sand
		3' - 4'		0.074 J	Sandy silt, silty sand
DI-23-01	D11	2' - 3'	4/27/2011	<0.21 U	Silty clay, clay
		3' - 4'		0.64 B	Silty clay, clay
DI-23-02	D11	0' - 1'	4/27/2011	0.30	Clayey silt, silty clay
		1' - 2'		0.086 J	Clayey silt, sandy silt
DI-24-01	D11	0' - 1'	4/26/2011	0.76	Silty sand, trace clay
		1' - 2'		0.15 J	Silt, little fine sand, trace clay
		2' - 3'		0.17 J	Clayey silt with some fine sand
		3' - 4'		0.18 J	Clayey silt with some fine sand
DI-25-01	D12	0' - 1'	4/26/2011	0.30	Sandy silt, trace clay
		1' - 2'		0.13 J [0.17 J]	Sandy silt, trace clay
		2' - 3'		0.052 J	Clayey silt, some fine sand
		3' - 4'		0.11 J	Clayey silt, some fine sand, decrease in fine sand
DI-26-01	D12	2' - 3'	4/28/2011	74.2 J [9.2 J]	Sandy silt, silty clay, gravel (fill)
		3' - 4'		129	Clayey silt, sandy silt, silt
DI-26-02	D12	0' - 1'	4/28/2011	0.66	Fine sand, little silt
		1' - 2'		0.13 J	Silty sand
		2' - 3'		0.098 J	Silty sand
		3' - 4'		0.13 J	Sandy silt
DI-27-01	D13	0' - 1'	4/28/2011	0.61	Clayey silt, sandy silt, silt
		1' - 2'		0.074 J	Sandy silt, silty sand
		2' - 3'		0.29	Sandy silt, clayey silt
		3' - 4'		0.12 J	Sandy silt, clayey silt, silty clay
DI-28-01	C13	0' - 1'	4/26/2011	0.16 J	Silty clay
		1' - 2'		0.083 J	Clay, silty clay
		2' - 3'		0.039 J	Clay, silty clay
		3' - 4'		0.043 J [<0.26]	Clay
DI-29-01	C14	0' - 1'	4/26/2011	0.23 J	Silt, clayey silt
		1' - 2'		0.18 J	Silty clay, clay
		2' - 3'		0.24	Silty clay, clay
		3' - 4'		0.11 J	Clay, silty clay, trace sandy silt
DI-30-01	D14	0' - 1'	4/28/2011	1.0	Clayey silt, sandy silt, silty sand
		1' - 2'		0.89	Sandy silt, silty sand
		2' - 3'		0.32	Sandy silt, silty sand, clayey silt
		3' - 4'		0.11 J [0.17 J]	Sandy silt, silty sand, clayey silt
DI-31-01	C15	0' - 1'	4/28/2011	0.19 J	Clayey silt, silt
		1' - 2'		0.22 J	Clayey silt, silty clay
		2' - 3'		0.13 J	Silty clay, clay
		3' - 4'		0.15 J	Silty clay, clay
DI-40-01	C3	0' - 1'	8/25/2011	1.3	Fine sand, little silt, organics to 6" then fine sand, trace silt
		1' - 2'		0.15 J	Fine sand, trace silt
		2' - 3'		0.12 J [0.21]	Fine sand, trace silt
		3' - 4'		0.13 J	Fine sand, trace silt
DI-41-01	G5	0' - 1'	5/2/2011	1.1	Clayey silt, silt, sandy silt
		1' - 2'		0.19 J	Clayey silt, sandy silt, silt
		2' - 3'		0.19 J	Sandy silt, silt, clayey silt
		3' - 4'		0.65	Sandy silt, clayey silt, silty clay, gravel

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-42-01	H9	0' - 1'	8/24/2011	0.31 [0.47]	Fine to medium sand, some silt
		1' - 2'		0.20 J	Fine to medium sand, some silt
		2' - 3'		0.063 J	Fine to medium sand, some silt
		3' - 4'		0.075 J	Fine to medium sand, some silt, trace clay
DI-43-01	C16	2' - 3'	4/28/2011	0.24 J	Silty clay
		3' - 4'		0.24 J	Silty clay
DI-43-02	C16	0' - 1'	4/28/2011	0.35	Clayey silt, silty sand
		1' - 2'		0.23 J	Silty clay
DI-44-01	D15	0' - 1'	4/28/2011	0.37	Silt, fine sand with some silt at 3"
		1' - 2'		0.50	Silty sand
		2' - 3'		0.19 J	Sandy silt
		3' - 4'		0.22 J	Sandy silt
DI-51-01	E8	0' - 1'	4/27/2011	3.8 B	Clayey silt, silt
		1' - 2'		<0.26 U	Clayey silt
		2' - 3'		<0.24 U	Clayey silt, sandy silt, silty clay
		3' - 4'		2.0 B	Sandy silt
DI-51-02	E8	0' - 1'	4/27/2011	0.53	Clayey silt
		1' - 2'		0.13 J	Clayey silt, silt
DI-52-01	H7	0' - 1'	8/25/2011	0.042 J	Fine sand, trace silt, wet
		1' - 2'		0.059 J	Fine sand, trace silt, wet
		2' - 3'		0.059 J	Gravelly sand
		3' - 4'		0.054 J	Gravelly sand
DI-53-01	I7	0' - 1'	4/29/2011	2.5	Sandy silt, organics, trace clay
		1' - 2'		1.3 J [0.39 J]	Sandy silt, organics, trace clay
		2' - 3'		0.39	Sandy silt, organics, trace clay
		3' - 4'		0.13 J	Sandy silt, organics, trace clay
DI-53-02	I7	0' - 1'	4/29/2011	0.83	Clayey silt, sandy silt, silt, organics
		1' - 2'		2.1	Sandy silt, silt, organics
DI-54-01	H9	0' - 1'	8/25/2011	0.18 J [0.15 J]	Fine sand, trace silt & organics
		1' - 2'		0.11 J	Fine sand, trace silt & organics
		2' - 3'		0.094 J	Fine sand, trace silt & organics
		3' - 4'		0.096 J	Fine sand, trace silt & organics
DI-60-01	G6	0' - 1'	5/2/2011	<0.24 U	Clayey silt, silt, roots
		1' - 2'		<0.24 U [<0.25 U]	Clayey silt, sandy silt
		2' - 3'		<0.30 U	Sandy silt, fine to coarse gravel
		3' - 4'		<0.30 U	Sandy silt, clay, silt, fine to coarse gravel
DI-61-01	H7	0' - 1'	5/2/2011	1.1	Silty clay, clayey silt, roots
		1' - 2'		0.20 J	Clayey silt, sandy silt, gravel, roots
		2' - 3'		0.099 J	Sandy silt, clayey silt, silty clay, gravel
		3' - 4'		<0.24 U	Sandy silt, clayey silt, silty clay, gravel
DI-SB-01-05	D10	0' - 1'	5/2/2011	4.0	Silty sand, organics, trace gravel
		1' - 2'		0.24	Silt, little clay, little fine sand
		2' - 3'		0.23	Silt
		3' - 4'		<0.26 U	Sandy silt, fine sand with trace clay at 3'-10"
		4' - 5'		0.20 J	Silt with some fine sand, little clay
		5' - 6'		0.26	Silty sand
		6' - 7'		0.14 J	Silty sand
		7' - 8'		0.16 J	Silty sand
		8' - 9'		0.19 J	Silt with little clay, organic silt at 8'-8"
		9' - 10'		0.45	Organic silt

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-SB-03-05	D14	0' - 1'	5/2/2011	0.091 J	Silty sand, organics
		1' - 2'		<0.25	Silty sand
		2' - 3'		0.058 J	Silty sand
		3' - 4'		0.069 J	Silty sand
		4' - 5'		0.077 J [0.12 J]	Grades to Clayey silt, little fine sand
		5' - 6'		0.065 J	Clayey silt
		6' - 7'		0.12 J	Clayey silt
		7' - 8'		0.13 J	Clayey silt, organics
		8' - 9'		0.25	Silty clay
		9' - 10'		<0.26	Silty clay
OCDDS-10	E7	0" - 6"	10/1996	0.4	---
		0" - 6"		<0.025	---
Pre-SS-P1	F7	---	4/17/1997	1.3	---
		---		<0.026	---
Post-SS-P1	F7	---	5/15/1997	0.14	---
		---		<0.026	---
SA-SB-01-01	D10	2' - 3'	10/20/2003	<0.59	Clayey Sand
		3' - 4'		<0.58	Clayey Sand
		4' - 5'		442	Organic Silt/Sand
		5' - 6'		0.86	Organic Silt/Sand to Clayey Sand
		6' - 7'		4.3	Clayey Sand
SA-SB-01-02	D10	0' - 1'	10/20/2003	1.87	Sand
		1' - 2'		<0.593	Sand
		2' - 3'		<0.581	Sand
		3' - 4'		<0.574	Sand
		4' - 5'		<0.583	Sand
		5' - 6'		431	Sand to Organic Silt/Sand
		6' - 7'		46.1	Organic Silt/Sand
		7' - 8'		<0.670	Clayey Sand
SA-SB-01-03	D10	0' - 1'	10/20/2003	2.64	Topsoil
		1' - 2'		6.48 [3.86]	Silty Sand
		2' - 3'		<0.611	Silty Sand
		3' - 4'		<0.58	Silty Sand
		4' - 5'		<0.592	Silty Sand
		5' - 6'		<0.60	Silty Sand
		6' - 7'		401	Organic Silt/Sand
		7' - 8'		52.1	Organic Silt/Sand to Silty Clay
		8' - 9'		<0.668	Silty Clay
SA-SB-01-04	D10	0' - 1'	10/20/2003	1.36	Sand
		1' - 2'		<0.597	Silty Sand
		2' - 3'		<0.623	Silty Sand to Silty Clay
		3' - 4'		<0.590 [<0.593]	Silty Clay
		4' - 5'		<0.589	Silty Sand
		5' - 6'		<0.597	Silty Sand
		6' - 7'		<0.608	Silty Sand
		7' - 8'		<0.608	Silty Sand
		8' - 9'		79.1	Silty Sand to Organic Silt/Sand
		9' - 10'		0.85	Organic Silt/Sand to Clay

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SA-SB-02-01	E11	0' - 1'	10/24/2003	1.4	Silty Sand
		1' - 2'		<0.55 [1.4]	Silty Sand
		2' - 3'		<0.55	Silty Sand
		3' - 4'		<0.54	Silty Sand
		4' - 5'		1.6	Silty Sand
		5' - 6'		322	Organic Silt/Sand
		6' - 7'		<0.7	Organic Silt/Sand
		7' - 8'		<0.59	Sandy Clay
		8' - 9'		<0.61	Sand to Silty Clay
		9' - 10'		<0.65	Silty Clay to Organic Silt/Sand
		10' - 11'		<0.68	Organic Silt/Sand/ Gravel
		11' - 12'		<0.57	Silty Clay
SA-SB-02-02	E11	0' - 1'	10/21/2003	0.761	Silty Sand
		1' - 2'		<0.552	Silty Sand
		2' - 3'		<0.577	Silty Sand
		3' - 4'		<0.559	Silty Sand
		4' - 5'		<0.577	Silty Sand
		5' - 6'		<0.611	Silty Sand
		6' - 7'		282	Silty Sand to Organic Silt/Sand
		7' - 8'		144	Organic Silt/Sand
		8' - 9'		121	Organic Silt/Sand
		9' - 10'		6.6	Organic Silt/Sand to Silty Clay
		10' - 11'		<0.62	Silty Clay
		11' - 12'		<0.632	Silty Clay
SA-SB-02-03	E11	0' - 1'	10/21/2003	<0.621	Silty Sand
		1' - 2'		<0.568	Silty Sand
		2' - 3'		<0.571	Silty Sand
		3' - 4'		<0.578	Silty Sand
		4' - 5'		<0.568	Silty Sand
		5' - 6'		<0.590	Silty Sand
		6' - 7'		<0.585	Silty Sand
		7' - 8'		0.682	Organic Silt/Sand
		8' - 9'		39.2	Silty Sand
		9' - 10'		<0.678	Organic Silt/Sand
		10' - 11'		13.6	Organic Silt/Sand to Clayey Silt
		11' - 12'		<0.668	Clayey Silt to Silty Clay
		12' - 13'		<0.613	Silty Clay
SA-SB-02-04	E11	0' - 1'	10/21/2003	<0.659	Silty Sand
		1' - 2'		<0.602	Silty Sand
		2' - 3'		<0.588	Silty Sand to Sand
		3' - 4'		<0.550	Sand
		4' - 5'		<0.590	Sand
		5' - 6'		<0.564	Sand
		6' - 7'		<0.566	Sand
		7' - 8'		<0.578	Sand
		8' - 9'		<0.584	Sand
		9' - 10'		<0.610	Organic Silt/Sand
		10' - 11'		<0.621	Silt/Sand
		11' - 12'		<0.629 [<0.620]	Silt/Sand
		12' - 13'		<0.636	Silt/Sand
		13' - 14'		98.4	Silt/Sand to Organic Silt/Sand

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SA-SB-03-01	D14	2' - 3'	10/21/2003	2.8	Silty Sand
		3' - 4'		153	Silty Sand to Organic Silt/Sand
		4' - 5'		372	Organic Silt/Sand
		5' - 6'		1.8	Clayey Sand to Sand
SA-SB-03-02	D14	2' - 3'	10/21/2003	<0.605	Silty Sand
		3' - 4'		<0.608	Silty Sand
		4' - 5'		142	Organic Silt/Sand
		5' - 6'		36.6	Organic Silt/Sand
		6' - 7'		3.58	Organic Silt/Sand
		7' - 8'		<0.726	Organic Silt/Sand
SA-SB-03-03	D14	0' - 1'	10/21/2003	<0.638	Silty Sand
		1' - 2'		<0.583 [<0.582]	Silty Sand
		2' - 3'		<0.604	Silty Sand
		3' - 4'		<0.633	Silty Sand
		4' - 5'		<0.661	Silty Sand
		5' - 6'		34.8	Silty Sand to Organic Silt/Sand
		6' - 7'		14.1	Organic Silt/Sand
		7' - 8'		<0.707	Organic Silt/Sand to Organic Silty Clay
		8' - 9'		<0.677	Organic Silty Clay
SA-SB-03-04	D14	0' - 1'	10/21/2003	<0.629	Silty Sand
		1' - 2'		<0.600	Silty Sand
		2' - 3'		<0.590 [<0.590]	Silty Sand
		3' - 4'		<0.578	Silty Sand
		4' - 5'		<0.605	Silty Sand
		5' - 6'		<0.610	Silty Sand
		6' - 7'		<0.622	Silty Sand
		7' - 8'		19.0	Silty Sand to Organic Sandy Silt
		8' - 9'		<0.749	Organic Sandy Silt to Silty Clay
		9' - 10'		1.61	Silty Sand
SA-SB-04-01	C15	0' - 1'	10/20/2003	<0.613	Silty Sand
		1' - 2'		<0.589	Silty Sand
		2' - 3'		<0.566	Silty Sand
		3' - 4'		<0.572	Silty Sand
		4' - 5'		<0.573	Clay/Silt
		5' - 6'		<0.610	Clay/Silt
		6' - 7'		<0.583	Clay/Silt
		7' - 8'		<0.629	Clay/Silt
		8' - 9'		7.84	Clay/Silt
		9' - 10'		<0.671	Organic Silt/Sand
		10' - 11'		3.73	Clay
SA-SB-04-02	C15	0' - 1'	10/20/2003	<0.597	Silty Sand
		1' - 2'		<0.602	Silty Sand
		2' - 3'		<0.586	Silty Sand
		3' - 4'		<0.602	Silty Sand
		4' - 5'		<0.573	Silty Sand to Sand
		5' - 6'		<0.613 [<0.595]	Sand to Silty Sand
		6' - 7'		139	Silty Clay to Organic Clayey Silt
		7' - 8'		1.73	Organic Silt/Sand
		8' - 9'		11.9	Organic Silt/Sand

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SA-SB-04-03	C15	0' - 1'	10/20/2003	2.17	Silty Sand
		1' - 2'		<0.588	Silty Sand
		2' - 3'		<0.561	Silty Sand
		3' - 4'		<0.617	Silty Sand
		4' - 5'		<0.603	Silty Sand
		5' - 6'		<0.635	Silty Sand
		6' - 7'		1,920	Silty Sand to Organic Silt/Sand
		7' - 8'		199	Organic Silt/Sand
SA-SB-04-04	C15	2' - 3'	10/20/2003	<0.56	Sandy Silt
		3' - 4'		<0.59	Silty Sand
		4' - 5'		<0.58	Silty Sand
		5' - 6'		84.7	Silty Sand to Organic Silt/Sand
		6' - 7'		112	Organic Silt/Sand
		7' - 8'		456	Silty Sand
SB-51	E4	2' - 3'	11/2002	4.9	Sandy Silt
		3' - 4'		7.2	Sandy Silt
SB-52	G7	2' - 3'	11/2002	1.8	Clayey Silt
		3' - 4'		<0.67	Clayey Silt
SB-53	F8	0' - 1'	11/2002	<0.61	Topsoil
		1' - 2'		<0.58	Sandy Silt
		2' - 3'		<0.56	Sandy Silt
		3' - 4'		<0.55	Sandy Silt
SB-60	C15	2' - 3'	11/2002	4.5	Clayey Silt
		3' - 4'		139	Clayey Silt/Peat
SB-201	E8	0' - 1'	11/2002	<0.61	Sandy Silt
		1' - 2'		<0.58	Sandy Silt
		2' - 3'		<0.55	Sandy Silt
		3' - 4'		<0.56	Sand
SB-202	E10	2' - 3'	11/2002	8.7	Sandy Silt
		3' - 4'		2,330	Sandy Silt/Peat
SB-203	D12	0' - 1'	11/2002	6.1	Silty Sand
		1' - 2'		<0.58	Silty Sand
		2' - 3'		2.0	Silty Sand
		3' - 4'		353	Silty Sand
SB-204	D12	2' - 3'	11/2002	80.4	Silty Sand
		3' - 4'		219	Silty Sand/Peat
SB-205	D13	2' - 3'	11/2002	148	Fill/Sandy Silt
		3' - 4'		291	Sandy Silt/Peat
SB-206	C14	2' - 3'	11/2002	79.8	Sandy Silt/Peat
		3' - 4'		82.6	Peat
SB-207	D15	2' - 3'	11/2002	71.4	Sandy Silt
		3' - 4'		125	Silty Sand
SB-217	C1	2' - 3'	10/29/2003	0.68	Sandy Silt
		3' - 4'		<0.65	Clayey Silt
		4' - 5'		<0.53	Till
SB-218	D1	0' - 1'	10/29/2003	0.76	Silty Sand
		1' - 2'		<0.60	Silty Sand
		2' - 3'		<0.60	Fill
		3' - 4'		<0.67	Fill to Organic Silt Sand to Silt/Sand/ Gravel
		4' - 5'		<0.63	Silt/Sand/ Gravel
		5' - 6'		<0.56	Silt/Sand/ Gravel/Peat
		6' - 7'		<0.55	Till
SB-219	D4	5' - 6'	10/30/2003	<0.54	Till

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SB-220	E4	0' - 1'	10/30/2003	<0.60	Silty Sand
		1' - 2'		<0.57	Silty Sand
		2' - 3'		<0.56	Silty Sand
		3' - 4'		<0.58	Silty Sand
		4' - 5'		<0.54	Silt/Sand/ Gravel/Cobble
		5' - 6'		<0.56	Silt/Sand/ Gravel/Cobble
		6' - 7'		<0.54	Silt/Sand/ Gravel/Cobble
		7' - 8'		<0.56	Silt/Sand/ Gravel/Cobble
SB-221	E5	3' - 4'	10/28/2003	13.3	Sandy Silt to Till
		4' - 5'		<0.56	Till
SB-222	E4	2' - 3'	10/28/2003	1.3	Silty Sand
		3' - 4'		0.65	Organic Silt/Sand
		4' - 5'		8.1	Organic Silt/Sand
		5' - 6'		<0.53	Till
SB-223	F5	2' - 3'	10/28/2003	7.5	Organic Silt/Sand
		3' - 4'		2.5 [2.8]	Organic Silt/Sand
		4' - 5'		26.6	Till
		5' - 6'		<0.55	Till
		6' - 7'		<0.533	Till
		7' - 8'		<0.545	Till
SB-224	F5	4' - 5'	10/28/2003	17.5	Till
		5' - 6'		<0.54	Till
		6' - 7'		<0.546	Till
SB-225	G7	5' - 6'	10/27/2003	<0.50	Silty Sand/Gravel/Cobbles
		6' - 7'		<0.51	Silty Sand/Gravel/Cobbles
		7' - 8'		<0.52	Silty Sand/Gravel/Cobbles
SB-226	G7	2' - 3'	10/27/2003	4.2 [3.9]	Organic Silt/Sand
		3' - 4'		0.80	Organic Silt/Sand
		4' - 5'		4.3	Till
		5' - 6'		<0.55	Till
		6'-7'		<0.53	Till
		7' - 8'		<0.53	Till
SB-227	D4	2' - 3'	10/28/2003	86.4	Sandy Silt
		3' - 4'		13.7	Organic Silt/Sand to Till
SB-400	E3	0' - 1'	10/30/2003	<0.59	Topsoil
		1' - 2'		<0.56	Silty Sand
		2' - 3'		<0.54	Silty Sand
		3' - 4'		<0.53	Silty Sand
		4' - 5'		<0.55	Silty Sand
		5' - 6'		<0.55	Silty Sand
		6' - 7'		<0.53	Silty Sand/ Gravel
		7' -8 '		<0.54	Silty Sand/ Gravel
		8' - 9'		<0.55	Sand
		9' - 10'		<0.54	Sand
		10' - 11'		<0.56	Silty Sand/ Gravel
		11' - 12'		<0.53	Silty Sand/ Gravel
		12' - 13'		<0.56	Silty Sand/ Gravel
		13' - 14'		<0.54	Silty Sand/ Gravel
		14' - 15'		<0.55	Silty Sand/ Gravel
		15' - 16'		<0.54	Silty Sand/ Gravel
SB-401	B1	2' - 3'	10/28/2003	35.6	Organic Silt/Sand to Till
		3' - 4'		<0.55	Till

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SB-402	D2	2' - 3'	10/29/2003	<0.68	Organic Silt/Sand /Gravel
		3' - 4'		<0.63	Organic Silt/Sand /Gravel
		4' - 5'		<0.64	Organic Silt/Sand /Gravel
		5' - 6'		<0.61 [<0.61]	Organic Silt/Sand /Gravel to Sand
		6' - 7'		<0.56	Till
SB-403	D4	2' - 3'	10/30/2003	89.1	Silt/Sand/ Gravel/Cobble
		3' - 4'		5.3	Silt/Sand/ Gravel/Cobble
SB-404	E4	2' - 3'	10/28/2003	<0.57	Silty Sand
		3' - 4'		<0.54	Silty Sand
		4' - 5'		<0.53	Till
SB-405	F6	0' - 1'	10/28/2003	<0.61	Silty Sand
		1' - 2'		<0.64	Silty Sand
		2' - 3'		<0.56	Sand/Gravel
		3' - 4'		<0.60	Fill
		4' - 5'		<0.63	Fill
		5' - 6'		<0.54	Silty Sand
		6' - 7'		<0.53	Till
SB-406	G7	0' - 1'	10/27/2003	0.92	Gravel
		1' - 2'		<0.56	Silty Sand
		2' - 3'		<0.52 [<0.55]	Silty Sand
		3' - 4'		<0.55	Silty Sand
		4' - 5'		<0.56	Silty Sand
		5' - 6'		<0.53	Silty Sand
		6' - 7'		<0.53	Silty Sand
		7' - 8'		<0.54	Silty Sand
SB-407	H7	2' - 3'	10/30/2003	<0.59 [<0.58]	Organic Silt/Sand
		3' - 4'		<0.60	Organic Silt/Sand
		4' - 5'		49.1	Organic Silt/Sand to Peat
		5' - 6'		<0.56	Till
SB-408	F8	0' - 1'	10/27/2003	1.1	Silty Sand
		1' - 2'		<0.62	Silty Sand
		2' - 3'		<0.54	Silty Sand
		3' - 4'		<0.52	Sand/Gravel/Cobbles
		4' - 5'		<0.52	Sand/Gravel/Cobbles
		5' - 6'		<0.52	Sand/Gravel/Cobbles
		6' - 7'		<0.56	Clayey Silt
		7' - 8'		<0.54	Clayey Silt
SB-409	G8	6' - 7'	10/28/2003	2.4	Organic Silt/Sand
		7' - 8'		0.96	Sand/Gravel
		8' - 9'		1,540	Peat to Organic Silt/Sand
		9' - 10'		1.2	Organic Silt/Sand to Sand/Gravel
		10' - 11'		<0.56	Sand/Gravel
		11' - 12'		<0.53	Till
SB-411	H8	2' - 3'	10/28/2003	<1.0	Organic Silt/Sand
		3' - 4'		<0.78	Organic Silt/Sand
		4' - 5'		2.1	Organic Silt/Sand
		5' - 6'		<0.63	Organic Silt/Sand to Sand/Gravel
		6' - 7'		<0.60 [<0.63]	Sand
		7' - 8'		<0.56	Sand to Till
SB-412	H8	5' - 6'	10/28/2003	13.6	Organic Silt/Sand
		6' - 7'		16.3	Till
		7' - 8'		1.1	Till

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SB-413	E10	4' - 5'	10/20/2003	2.2	Organic Silt/Sand
		5' - 6'		3.5	Organic Clayey Sand
		6' - 7'		<0.85	Organic Silt/Sand
SB-414	E10	6' - 7'	10/24/2003	1.3	Organic Clayey Silt
		7' - 8'		<0.72	Organic Silt/Sand
SB-435	C1	2' - 3'	4/28/2004	4.43 [4.87]	Till
SB-436	B1	2' - 3'	4/28/2004	<0.736	Organic Silt
SB-437	B2	0' - 1'	4/28/2004	<0.655	Organic Silt
		1' - 2'		<0.644	Organic Silt
		2' - 3'		<0.596	Silt
		3' - 4'		<0.605	Silt
SB-438	C4	0' - 1'	4/28/2004	1.91	Organic Silty Sand
		1' - 2'		1.03	Organic Silty Sand
		2' - 3'		4.63	Silty Sand
		3' - 4'		5.65	Silty Sand
SB-439	E4	0' - 1'	4/28/2004	<0.641	Organic Silty Sand
		1' - 2'		<0.634 [<0.628]	Organic Silty Sand
SB-440	E6	0' - 1'	4/28/2004	<0.644	Silty Sand
		1' - 2'		<0.614	Sand
		2' - 3'		<0.576	Sand
		3' - 4'		<0.590	Sand
		4' - 5'		<0.610	Sand
SB-441	F5	2' - 3'	4/28/2004	2.37	Silty Sand
SB-442	G7	0' - 1'	4/28/2004	0.685	Organic Silty Sand
		1' - 2'		<0.618	Organic Silty Sand
		2' - 3'		<0.618	Sandy Silty Clay
SB-443	G7	2' - 3'	4/28/2004	<0.871	Organic Silt
		3' - 4'		<0.624	Silty Sandy Clay
SB-444	H8	2' - 3'	4/28/2004	28.4	Sandy Silt
		3' - 4'		1.05	Sandy Silt
		4' - 5'		0.973	Sandy Silt
SB-445	G7	4' - 5'	4/28/2004	58.4	Silty Sand
SB-448	H9	0' - 1'	4/28/2004	1.66	Silty Sand
		1' - 2'		<0.608	Sandy Silt
		2' - 3'		<0.605	Sandy Silt
		3' - 4'		3,800	Sandy Silt
		4' - 5'		2,120	Sandy Silt
		5' - 6'		16.9	Sand & Silt
SB-449	G9	2' - 3'	4/29/2004	<0.609	Clayey Silt
		3' - 4'		<0.613	Clayey Silt
		4' - 5'		<0.64	Clayey Silt
		5' - 6'		<0.619	Silty Clay
		6' - 7'		84.7	Clayey Silt
		7' - 8'		2,220	Organic Silt
		8' - 9'		8.27	Silt
		9' - 10'		14.6	Sandy Silt
		10' - 11'		18.3	Organic Silt
		11' - 11.5'		8.21	Sandy Silt
SB-450	F9	2' - 3'	4/29/2004	38.0	Organic Clayey Silt
		3' - 4'		10.4	Silt
		4' - 4.5'		1.44	Silty Sand

Table 2A
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
NYS Thruway to Brookview Lane

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SB-452	E10	0' - 1'	4/29/2004	<0.654	Topsoil
		1' - 2'		<0.623	Clayey Silt
		0' - 1'		<0.607	Clayey Silt
		1' - 2'		<0.620	Silt
		2' - 3'		<0.619	Sandy Silt
		3' - 4'		<0.605	Clayey Silt
		4' - 5'		<0.588	Clayey Silt
		5' - 6'		1.46	Sandy Silt
SB-457	C2	2' -2.25'	4/29/2004	3.9	Sandy Silt
SB-459	C2	2' - 3'	4/29/2004	30.3	Organic Clayey Silt
SSSWP-1N	F8	0" - 6"	4/27/2011	1.8	Silt and fine sand, organics
		6" - 12'		0.045 J	Fine sand
		1' - 2'		0.048 J	Fine sand, wet
SSSWP-1S	F8	0" - 6"	4/27/2011	6.8	Sandy silt with organics
		6" - 12'		4.3	Sandy silt with organics
		1' - 2'		3.2	Sandy silt with organics, trace gravel
SSSWP-1W	F8	0" - 6"	4/27/2011	2.6	Sandy silt with organics
		6" - 12'		0.40	Silty sand with organics
		1' - 2'		0.58 J	Fine sand
SSSWP-2	F7	0" - 6"	12/19/2007	2.2	---
		6" - 15"		0.62	---
SSSWP-3	F7	0" - 6"	12/19/2007	0.77	---
		6" - 24"		<0.05	---
SSSWP-4	F6	0" - 6"	12/19/2007	4.7	---
		6" - 24"		<0.04	---
SSSWP-5	E5	0" - 6"	12/19/2007	3.2	---
		6" - 24"		0.28	---

Notes:

1. Boring locations are shown on Figure 3A.
2. Figure coordinates correspond to coordinate system shown on Figure 3A.
3. Highlighted result indicates the presence of residual cadmium as defined in the SMP.
4. mg/kg = milligrams/kilograms (equivalent to ppm = parts per million).
5. Duplicate results are presented in brackets.
6. B - Compound was found in the blank and sample.
7. J - The detected concentration is an estimated value.
8. U - Result edited to reflect non-detect by data validation company due to presence of cadmium in the associated preparation blank at similar concentrations.
9. < - Analyte not detected at the reporting limit shown.
10. Any soil borings (the full boring or only down to a particular depth) that were fully removed during excavation activities have been omitted for this summary.

Table 2B
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Brookview Lane to Old Liverpool Road

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
B-6	E29	0.80' - 1.5'	11/24/2003	0.97	---
		1.5' - 7.5'		<0.59	---
B-7	D29	0' - 1.5'	11/24/2003	2	---
		1.5' - 10'		2.5	---
B-8	E28	0' - 2.5'	11/24/2003	0.72	---
		2.5' - 10'		0.93	---
B-9	F27	0' - 1'	11/24/2003	<0.62	---
		1' - 10'		<0.57	---
B-10	F22	0' - 1.5'	11/25/2003	7	---
		1.5' - 10'		0.95	---
DI-04-01	F17	0' - 1'	4/25/2011	1.7	Silt with little clay & little sand
		5' - 6'		0.29	Silty clay with some fine sand
		6' - 7'		1.4	Clay with little silt (organics)
		7' - 8'		332	Clay with little silt (organics)
		8' - 9'		0.98	Clay with little silt (organics)
DI-05-01	F17	``	4/24/2015	0.091 J	Tan to brown silt, little low plasticity clay
		5' - 6'		0.83	Tan to brown silt, some medium plasticity clay
		6' - 7'		0.051 J	Brown high plasticity clay, little silt
		7' - 8'		0.13 J	Tan to brown high plasticity clay
DI-05-04	F18	2' - 3'	6/17/2015	3.3	Brown fine sand, gravel
		3' - 4'		0.45	Brown fine sand, gravel
DI-05-05	F18	0' - 1'	6/17/2015	0.22 J	Very fine brown sand, silt
		1' - 2'		0.11 J	Brown silt, some very fine sand, trace clay
DI-06-01	F18	0' - 1'	4/25/2011	1.4	Fine sand with little silt
		1' - 2'		0.19 J	Fine sand with little silt
		2' - 3'		0.24	Silt with some fine sand & trace clay
		3' - 4'		0.25	Silt with some fine sand & trace clay
		4' - 5'		0.47	Silt with some fine sand & trace clay
		5' - 6'		10.5	Silt with little sand & little clay
		6' - 7'		0.48	Silt with little sand & little clay
		7' - 8'		<0.26 U	Gray clay at 7'-6"
DI-06-02	F18	4' - 5'	4/25/2011	0.20 J	Silt with little clay
		5' - 6'		3.2	Silt with little clay
		6' - 7'		0.26 J	Silt with little clay
DI-07-01	F20	2' - 3'	8/14/2009	20.7 J	Silt & sand
		3' - 4'		1.16 J	Silt & clay
DI-07-02	F20	2' - 3'	8/14/2009	10.8 J	Silt & clay/gravel
		3' - 4'		12.1 J	Silt & sand/clay
		4' - 5'		6.11 J	Silt & sand/clay
		5' - 6'		5.25 J	Silt & sand/clay
DI-07-03	F20	0' - 1'	8/14/2009	0.422	Silt & clay/gravel & organics
		1' - 2'		0.535	Silt & clay
		2' - 3'		7.38	Silt & clay
		3' - 4'		3.39	Silty clay
		4' - 5'		5.06	Silt & sand/clay & gravel
		5' - 6'		73	Silt & clay
		6' - 7'		<0.267	Silty clay/sand
		7' -8'		<0.261	Silt & sand
		8' - 9'		0.277 J	Silty clay/sand
		9' -10'		1.49	Silty clay to sand
		10' - 11'		<0.243	Sand/clay to silty clay
DI-08-01	F21	0' - 1'	4/26/2011	0.25	Clayey silt, sand
		1' - 2'		0.24	Sand, silty clay
		2' - 3'		0.38	Silty clay
		3' - 4'		0.10 J	Silty clay
		4' - 5'		5.6	Clayey silt, silty clay
		5' - 6'		1.0	Silty clay, clayey silt
DI-09-01	F21	2 - 3'	9/21/2009	5.74	Sand & silt, trace organics & gravel
		3 - 4'		0.246	Silt & sand, trace gravel
		4 - 5'		0.254	Sand & silt
		5 - 6'		4.21	Silt & sand, trace gravel
		6 - 7'		9.12	Silt

Table 2B
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Brookview Lane to Old Liverpool Road

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-09-02	F21	2 - 3'	9/21/2009	0.982	Sand & silt, organics & trace clay
		3 - 4'		0.77	Silt & sand, trace organics
		4 - 5'		9.40	Silt & sand, trace organics
		5 - 6'		5.76	Silty clay & fine sand
		6 - 7'		3.55	Fine sand & silt
DI-11-01	F22	2' - 3'	8/14/2009	3.76	Silt with sand/clay & gravel
		3' - 4'		49	Silt with sand/clay & gravel
DI-11-02	F22	0' - 1'	8/14/2009	0.431 [0.276]	Silt with gravel/organics
		1' - 2'		0.062 J	Silt with clay/gravel & organics
		2' - 3'		0.266	Silt with gravel
		3' - 4'		0.240	Silt
		4' - 5'		0.213 J	Silt with gravel
		5' - 6'		0.074 J	Silt with gravel
DI-11-03	F22	0' - 1'	8/14/2009	<0.261	Silt & clay/organics & gravel
		1' - 2'		0.523	Silt & clay/organics & gravel
		2' - 3'		0.154 J	Silt with gravel/organics
		3' - 4'		0.327	Silt with gravel/organics
		4' - 5'		<0.253	Silt with gravel/organics
		5' - 6'		0.061 J	Silt with gravel/organics, some sand
		6' - 7'		<0.243	Silt with gravel/organics, some sand
		7' -8'		<0.250	Silt with gravel/organics, some sand
		8' - 9'		<0.265	Silt/clay
		9' -10'		<0.235	Silty clay/sand
		10' - 11'		<0.267	Silty clay/sand
DI-13-01	F27	4' - 5'	8/23/2011	0.19 J [0.14 J]	Sandy silt to 4'-6" then silty clay
		5' - 6'		0.22 J	Clay, trace silt
		6' - 7'		0.16 J	Clay, trace silt
DI-13-03	F27	0' - 1'	8/23/2011	0.91	Fine sand, some gravel, organics
		1' - 2'		0.072 J	Fine sand, some gravel
		2' - 3'		0.25	Fine sand, some gravel, organics
		3' - 4'		0.11 J	Fine sand, some gravel, organics
		4' - 5'		5.8	Clayey silt, increasing clay with depth
		5' - 6'		1.1	Silty clay to 5'-8" then silt
		6' - 7'		<0.22	Clayey silt
DI-14-01	E27	0' - 1'	8/23/2011	0.50	Sand, some gravel, trace silt
		1' - 2'		0.14 J [0.40]	Sand, some gravel, some silt
		2' - 3'		0.15 J	Sand, some gravel, some silt, trace clay
		3' - 4'		0.045 J	Sand, some gravel, trace silt
		4' - 5'		5.3	Sand, some gravel, trace silt to 4'-6" then silt, trace clay
		5' - 6'		78.1	Silt with organics, trace clay
		6' - 7'		0.42	Silt with less organics, trace clay
DI-14-02	E27	4' - 5'	8/23/2011	0.058 J	Sand, some gravel, trace silt
		5' - 6'		4.9 J	Sand, some gravel, trace silt to 5'-6" then silt, organics, trace clay
		6' - 7'		4.6 J	Silt, organics, trace clay
		7' - 8'		0.52 J	Clayey silt, trace fine sand
DI-15-01	C30	2' - 3'	8/22/2011	18	Silty sand, little gravel, trace clay
		3' - 4'		4.9	Silty sand, little gravel, trace clay
		4' - 5'		0.27	Silt, trace clay
		5' - 6'		0.21 J	Silt, little clay
		6' - 7'		0.19 J	Silt, little clay
DI-15-02	C30	0' - 1'	8/22/2011	2.5	Silty sand & gravel, trace clay
		1' - 2'		3.7	Silty sand & gravel, trace clay
		2' - 3'		2.3	Sandy silt with little gravel, trace clay
		3' - 4'		2.9	Sandy silt with little gravel, trace clay
		4' - 5'		1.5	Silt, little clay (green & red mottling)
		5' - 6'		0.26 [0.20 J]	Silt, little clay
		6' - 7'		0.14 J	Silt, little clay
DI-32-01	E18	0' - 1'	4/24/2015	0.28	Brown loam, some low plasticity clay, little silt
		1' - 2'		0.076 J [0.22 J]	Tan silt, some low plasticity clay
		2' - 3'		0.068 J	Tan silt, some low plasticity clay
		3' - 4'		0.30	Tan low plasticity clay, some silt
		4' - 5'		1.9	Tan to brown silt, some clay, trace fine sand
		5' - 6'		2.0	Tan to brown silt, some clay, trace fine sand
		6' - 7'		90.9 [86.7]	Tan to brown silt, some clay, trace fine sand
		7' - 8'		10.6	Tan to brown silt, some clay, trace fine sand

Table 2B
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Brookview Lane to Old Liverpool Road

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-32-02	E18	5' - 6'	4/24/2015	0.21 J	Brown silt, some high plasticity clay
		6' - 7'		0.23 J	Brown high plasticity clay, some silt
		7' - 8'		75.3	Brown high plasticity clay, some silt
DI-32A-01	F20	0 - 1'	9/21/2009	0.276 [0.215 J]	Silt, organics and gravel
		1 - 2'		1.72	Sand & silt, gravel
		2 - 3'		4.71	Sand & silt, gravel
		3 - 4'		0.591	Sand & silt, gravel
		4 - 5'		78.6	Sand & silt, gravel
		5 - 6'		6.53	Sand & silt, gravel
DI-32C-01	F21	0 - 1'	9/21/2009	0.444	Sand & silt, organics
		1 - 2'		1.19	Sand & silt, gravel
		2 - 3'		0.238 [0.180 J]	Sand & silt, gravel
		9 - 10'		<0.255	Silty clay
		10 - 11'		<0.235	Silty clay
DI-32C-02	F21	0 - 1'	9/21/2009	0.460	Sand & silt, organics
		1 - 2'		1.32	Sand & silt, organics
		2 - 3'		0.164 J	Silt & sand, trace clay
DI-33-01	G23	0' - 1'	8/11/2009	2.26	Gravel/silt and sand
		1' - 2'		2.48	Silty clay with gravel
		2' - 3'		2.05 [2.74]	Silty clay with gravel
		3' - 4'		3.95	Silty clay with gravel/organics
		4' - 5'		2.73	Silty clay with gravel/organics
DI-45-01	F19	4' - 5'	4/25/2011	4.5	Clay, silty clay, occasional roots
		5' - 6'		2.8	Clay, clayey silt, silt, sandy silt
		6' - 7'		9.5	Clayey silt, clay, sandy silt
		7' - 8'		0.58	Clay
DI-45-02	F19	2' - 3'	4/25/2011	2.5	Clay, silty clay
		3' - 4'		2.6	Clay, silty clay
DI-45-03	F19	0' - 1'	4/25/2011	0.50	Clay, silty clay
		1' - 2'		0.21 J	Clay, silty clay
DI-46-02	F21	0' - 1'	4/27/2011	0.79	Clayey silt, silty clay, fine to coarse gravel
		1' - 2'		0.70	Fine to coarse gravel, silty clay
DI-47-01	F21	0' - 1'	4/26/2011	2.2	Clayey silt with little fine sand
		1' - 2'		2.6	Clayey silt with little fine sand
DI-47-03	F21	0' - 1'	4/26/2011	0.60	Clayey silt with little fine sand, trace gravel
		1' - 2'		1.4	Clayey silt with little fine sand, trace gravel, less clay
DI-48-01	F21	2' - 3'	4/25/2011	6.5 B	Silty clay with clay
		3' - 4'		9.8 B	Clay with silty clay
DI-49-01	G23	2' - 3'	4/25/2011	3.3 BJ [0.84 BJ]	Clay, silty clay, little gravel
		3' - 4'		1.7 B	Clay, silty clay
DI-55-01	G23	0' - 1'	4/25/2011	2.6 B	Silty clay, clay
		1' - 2'		1.5 B	Clay
		2' - 3'		30.5 B	Clay, silty clay, clayey silt
		3' - 4'		12.5 B	Clayey silt, silt
DI-55-03	F23	0' - 1'	4/25/2011	0.52	Clay, silty clay, roots
		1' - 2'		1.0	Silty clay, silt, trace gravel
		2' - 3'		1.9	Silty clay, little sand
		3' - 4'		0.87	Silty clay, little sand
		4' - 5'		35.9	Clayey silt, some sand
DI-55-04	F23	4' - 5'	6/4/2013	20.3	Silty Clay, some sand
DI-58-03	F27	4' - 5'	6/4/2013	1.6	Clayey silt, some sand, organics
		5' - 6'		0.22 J	Silty clay, green mottling (organics)
DI-58-05	F26	1' - 2'	8/13/2013	2.1 B	Silt and Clay, some sand, trace gravel
DI-63-01	F19	0' - 1'	6/4/2013	0.54	Clay and silt, some sand and gravel
DI-64-03	F21	2' - 3'	8/13/2013	10.8 B	Sand and Silt, trace gravel
		3' - 4'		5.4 B	Clayey Silt and Sand
DI-70-02	D28	0' - 1'	6/3/2013	2.7	Clayey silt, little sand, organics
DI-72-01	F19	2' - 3'	6/5/2013	2.7 J [6.1 J]	Silty clay, some sand, trace gravel, oxidation zones
		3' - 4'		7.7 J	Clayey silt and sand
DI-76-02	G23	1' - 2'	6/4/2013	1.6	Silty clay, some sand, trace gravel
DI-79-01	F23	4' - 5'	6/4/2013	29.1	Silt, some sand, and clay
DI-79-02	F23	4' - 5'	6/4/2013	13.9	Clayey silt, some sand, trace gravel

Table 2B
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Brookview Lane to Old Liverpool Road

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-SB-05-05	F19	0' - 1'	4/25/2011	0.94	Silty sand, trace clay
		1' - 2'		0.24 [0.23]	Sandy silt
		2' - 3'		<0.26 U	Silty sand
		3' - 4'		0.52 B	Fine sand with some gravel, trace silt
		4' - 5'		0.33 B	Grades to Sandy silt with little gravel
		5' - 6'		0.54 B	Sandy silt, trace gravel, trace clay
		6' - 7'		0.88 B	Sandy silt, trace gravel, trace clay
		7' - 8'		1.0 B	Clay, trace gravel at 7'
DI-SB-07-01	B30	0' - 1'	8/22/2011	0.93	Course sand, some silt, little gravel, trace clay
		1' - 2'		1.4	Coarse sand, some silt, little gravel & clay
		2' - 3'		0.061 J	Fine sandy silt, little to trace clay
		3' - 4'		0.12 J	Clayey silt, trace fine sand
		4' - 5'		0.060 J	Silty Clay
		5' - 6'		<0.23	Silty Clay
		6' - 7'		<0.22	Silty Clay, silt lense 6'-2", clay at 6'-8"
DI-SB-07-02	B30	0' - 1'	8/22/2011	0.32	Silty Sand, some gravel
		1' - 2'		0.28	Silty fine sand, trace clay & gravel
		2' - 3'		0.10 J	Silty fine sand, trace clay & gravel
		3' - 4'		0.13 J [0.21 J]	Sand, silt, little clay
		4' - 5'		0.064 J	Clayey silt - increasing clay with depth
		5' - 6'		0.035 J	Silty clay - increasing clay with depth
		6' - 7'		0.059 J	Clay, little to trace silt
SA-SB-05-02	F19	0' - 1'	10/22/2003	1.4	Silty Sand
		1' - 2'		<0.58	Silty Sand
		2' - 3'		1.4	Silty Sand
		3' - 4'		<0.60	Silty Sand
		4' - 5'		<0.60	Clayey Silt
		5' - 6'		12.5	Clayey Silt
		6' - 7'		<0.58	Sandy Silt
		7' - 8'		<0.59	Sandy Silt to Organic Clayey Silt
		8' - 9'		5.1	Organic Clayey Silt
		9' - 10'		5.9	Organic Clayey Silt
		10' - 11'		8.1	Organic Clayey Silt
SA-SB-05-03	F19	4' - 5'	10/22/2003	<0.607	Clayey Silt
		5' - 6'		2.5	Organic Clayey Silt
		6' - 7'		0.587	Organic Clayey Silt
		7' - 8'		20.5	Organic Clayey Silt
		8' - 9'		21.8	Clayey Silt
		9' - 10'		<0.661	Clayey Silt
SA-SB-05-04	F19	4' - 5'	10/22/2003	7.5	Organic Silty Clay
		5' - 6'		2.4	Organic Silty Clay
		6' - 7'		12.0	Organic Silty Clay
		7' - 8'		11.3	Organic Clayey Silt
		8' - 9'		20.9	Organic Clayey Silt
		9' - 10'		<0.72	Organic Sand/Silt
		10' - 11'		<0.85	Organic Sand/Silt
		11' - 12'		<0.63	Silty Sand
		12' - 13'		<0.68	Organic Silt/Sand
		13' - 14'		<0.68	Organic Silt/Sand
SA-SB-06-01	E28	4' - 5'	10/24/2003	2.6	Silty Sand
		5' - 6'		3.4	Silty Sand
		6' - 7'		<0.60	Silty Sand to Organic Clayey Silt
		7' - 8'		<0.63	Organic Clayey Silt
		8' - 9'		<0.65	Silty Clay
SA-SB-06-02	E28	0' - 1'	10/24/2003	1.09 [1.77]	Silty Sand
		1' - 2'		<0.567	Silty Sand
		2' - 3'		<0.522	Silty Sand
		3' - 4'		0.703	Silty Sand
		4' - 5'		30.3	Silty Sand to Organic Clayey Silt
		5' - 6'		60.1	Organic Clayey Silt
		6' - 7'		1.44	Organic Clayey Silt to Silty Clay
		7' - 8'		6.18	Organic Clayey Silt
		8' - 9'		7.35	Silty Clay

Table 2B
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Brookview Lane to Old Liverpool Road

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SA-SB-06-03	E28	0' - 1'	10/24/2003	<0.611	Silty Sand
		1' - 2'		<0.566	Organic Silt/Sand
		2' - 3'		<0.579	Silty Sand
		3' - 4'		<0.585	Silty Sand
		4' - 5'		7.63	Silty Sand
		5' - 6'		64.4	Organic Clayey Silt
		6' - 7'		<0.668	Organic Clayey Silt
		7' - 8'		<0.625	Clayey Silt to Clay
		8' - 9'		<0.634	Clay
SA-SB-06-04	E28	0' - 1'	10/24/2003	<0.605	Silty Sand
		1' - 2'		<0.561	Silty Sand
		2' - 3'		<0.573	Silty Sand
		3' - 4'		<0.554	Silty Sand
		4' - 5'		1.78	Fill
		5' - 6'		88.1	Organic Clayey Silt
		6' - 7'		<0.693	Organic Clayey Silt
		7' - 8'		<0.678	Clay to Silty Clay
		8' - 9'		<0.636	Clay
SA-SB-216-01	F19	2' - 3'	10/22/2003	<0.56	Silty Sand
		3' - 4'		0.65	Clayey Silt
		4' - 5'		24.9	Clayey Silt
		5' - 6'		0.77	Clayey Silt
		6' - 7'		4.7	Clayey Silt
		7' - 8'		<0.65	Clayey Silt
		8' - 9'		20.6	Clayey Silt
		9' - 10'		<0.654	Organic Clayey Silt
SA-SB-216-02	E19	0' - 1'	10/22/2003	0.659	Silty Sand
		1' - 2'		<0.588	Silty Sand
		2' - 3'		<0.617	Silty Sand
		3' - 4'		<0.602	Silty Sand
		4' - 5'		5.38	Silty Sand
		5' - 6'		14.5	Organic Clayey Silt
		6' - 7'		1.57 [0.823]	Organic Clayey Silt
		7' - 8'		<0.68	Silty Clay
		8' - 9'		0.903	Silty Clay
		9' - 10'		<0.756	Organic Clayey Silt
		10' - 11'		<0.719	Organic Clayey Silt
		11' - 12'		<0.62	Silty Clay
		12' - 13'		<0.616	Silty Sand
		13' - 14'		<0.60	Silty Sand
SA-SB-216-03	E19	0' - 1'	10/22/2003	<0.60	Silty Sand
		1' - 2'		<0.598	Silty Sand
		2' - 3'		<0.617	Silty Sand
		3' - 4'		<0.624	Silty Clay
		4' - 5'		1.54	Silty Clay
		5' - 6'		<0.632	Sandy Silt
		6' - 7'		<0.641	Sandy Silt
		7' - 8'		<0.713	Sandy Silt
		8' - 9'		<0.635	Sandy Silt
		9' - 10'		<0.635	Organic Silt/Sand
SA-SB-216-04	E19	0' - 1'	10/22/2003	<0.59	Silty Sand
		1' - 2'		<0.57	Silty Sand
SB-12	B31	0' - 1'	11/2001	2.11	---
SB-61	F19	2' - 3'	11/2002	26.2	Silty Sand
		3' - 4'		864	Silty Sand/Peat
SB-62	F19	2' - 3'	11/2002	263	Sandy Silt
		3' - 4'		208	Silty Sand
SB-66	G24	2' - 3'	11/2002	1.1	Clayey Silt
		3' - 4'		<0.60	Clayey Silt
SB-72	D29	2' - 3'	11/2002	1.7	Silty Sand
		3' - 4'		4.3	Silty Sand/Clay
SB-74	B30	2' - 3'	11/2002	1.4	Fill
		3' - 4'		<0.62	Fill/Sandy Silt
SB-208	F19	2' - 3'	11/2002	600	Silty Sand
		3' - 4'		41.7	Sandy Silt

Table 2B
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Brookview Lane to Old Liverpool Road

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SB-209	F21	2' - 3'	11/2002	10.0	Silty Sand
		3' - 4'		10.7	Silty Sand
SB-210	C30	2' - 3'	11/2002	1.9	Silty Sand
		3' - 4'		<0.54	Silty Sand
SB-229	F17	0' - 1'	10/21/2003	1.9	Silty Sand
		1' - 2'		0.67	Silty Sand
		2' - 3'		<0.61 [<0.60]	Silty Sand
		3' - 4'		<0.61	Silty Sand
		4' - 5'		103	Silty Sand
		5' - 6'		1,390	Organic Silt/Sand
		6' - 7'		247	Organic Silt/Sand to Clayey Silt
		7' - 8'		2.7	Clayey Silt to Silty Clay
SB-230	F21	2' - 3'	10/23/2003	<0.57	Fill
		3' - 4'		0.81	Silty Sand
		4' - 5'		<0.60	Silty Sand
		5' - 6'		<0.61	Silty Sand to Silty Clay
		6' - 7'		6.0	Organic Silty Clay
		7' - 8'		<0.65 [<0.68]	Organic Silty Clay
		8' - 9'		<0.62	Silty Clay
		9' - 10'		<0.59	Silty Clay
		10' - 11'		<0.67	Organic Silty Clay
		11' - 12'		<0.62	Silty Clay
SB-415	F24	0' - 1'	10/23/2003	0.99	Silty Sand
		1' - 2'		2.3	Silty Sand
		2' - 3'		<0.60	Silty Sand
		3' - 4'		<0.59	Silty Sand to Clayey Silt
		4' - 5'		2.1	Silty Sand
		5' - 6'		<0.60	Silty Sand
		6' - 7'		<0.55	Silty Sand
		7' - 8'		<0.61 [<0.59]	Organic Silt/Sand
		8' - 9'		<0.64	Silty Clay
		9' - 10'		<0.57	Silty Clay to Silty Sand
SB-416	G23	2' - 3'	10/23/2003	1.1	Silty Sand
		3' - 4'		123	Organic Silt/Sand
		4' - 5'		16.8	Organic Silt/Sand
		5' - 6'		0.79	Organic Silt/Sand
		6' - 7'		<0.62	Silty Clay
		7' - 8'		<0.65	Silty Clay
SB-417	G24	4' - 5'	10/24/2003	18.4	Organic Clayey Silt
		5' - 6'		<0.73	Organic Clayey Silt
		6' - 7'		<0.63	Organic Clayey Silt to Clay
		7' - 8'		<0.73	Silty Sand
SB-453	F17	0' - 1'	4/29/2004	4.03	Sandy Silt
		1' - 2'		<0.590	Sandy Silt
		2' - 3'		<0.612	Sandy Silt
		3' - 4'		<0.623	Clayey Silt
		4' - 5'		3.29	Clayey Silt
		5' - 6'		91.9	Clayey Silt
		6' - 7'		130	Clayey Silt
		7' - 8'		<0.734	Clayey Silt
SB-455	G23	0' - 1'	4/29/2004	2.31	Sandy Silt
		1' - 2'		<0.615	Clayey Silt
		2' - 3'		<0.602	Clayey Silt
		3' - 4'		7.04	Clayey Silt
		4' - 5'		<0.681	Clayey Silt

Notes:

1. Boring locations are shown on Figure 3B.
2. Figure coordinates correspond to coordinate system shown on Figure 3B.
3. Highlighted result indicates the presence of residual cadmium as defined in the SMP.
4. mg/kg = milligrams/kilograms (equivalent to ppm = parts per million).
5. Duplicate results are presented in brackets.
6. B - Compound was found in the blank and sample.
7. J - The detected concentration is an estimated value.
8. U - Result edited to reflect non-detect by data validation company due to presence of cadmium in the associated preparation blank at similar concentrations.
9. < - Analyte not detected at the reporting limit shown.
10. Any soil borings (the full boring or only down to a particular depth) that were fully removed during excavation activities have been omitted for this summary.

Table 2C
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Old Liverpool Road to Onondaga Lake Parkway

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
B-1	G44	0' - 2.5'	11/25/2003	1.5	---
		2.5' - 12'		<0.63	---
B-2	G44	7' -8'	11/25/2003	<0.59	---
B-3	G44	0' - 5'	11/24/2003	<0.61 [<0.61]	---
		5' - 14'		<0.64	---
B-4	E44	0' - 2'	11/24/2003	<0.63	---
		2' - 12'		<0.71	---
B-5	D43	0' - 1.5'	11/24/2003	<0.54	---
		1.5' - 12'		7.5	---
B-11	C43	0' - 4'	3/5/2004	0.74 [0.63]	---
		4' - 8'		0.87	--
		8' - 12'		0.66	---
B-12	B43	0' - 4'	3/5/2004	<0.61	---
		4' - 8'		0.69	--
		8' - 12'		<0.58	---
DI-16-01	D35	0' - 1'	8/24/2011	3.3	Gravelly coarse sand with organics
		1' - 2'	8/24/2011	4.5	Gravelly coarse to fine sand with organics
		2' - 3'	8/24/2011	5.1	Gravelly coarse to fine sand with organics
		3' - 4'	8/24/2011	5.7	Coarse to fine sand with trace silt, gravel & organics
		4' - 5'	8/24/2011	0.19 J	Clayey silt
		5' - 6'	8/24/2011	0.14 J	Silty clay to clay at 6'
DI-16-02	D35	2' - 3'	8/24/2011	3.2	Fine sand, trace gravel, organics & silt
		3' - 4'	8/24/2011	0.81 J	Coarse to fine gravelly sand
		4' - 5'	8/24/2011	0.31	Silt, little clay, little gravel & pebbles
		5' - 6'	8/24/2011	0.17 J	Silty clay
DI-16-03	D36	0' - 1'	8/24/2011	6.2	Organics, silt with pebbles, some sand
		1' - 2'	8/24/2011	0.33	Clayey silt, pebbles, trace fine sand
		2' - 3'	8/24/2011	0.44 [0.17 J]	Silty clay with organics to 2'-3" then silty sand, little gravel, trace clay
		3' - 4'	8/24/2011	0.040 J	Gravelly sand (coarse to fine)
		4' - 5'	8/24/2011	0.24	Silt
		5' - 6'	8/24/2011	0.13 J	Clayey silt to silty clay with depth
DI-81-01	D36	2' - 3'	8/13/2013	11.4 B	Sandy Silt, trace gravel, rock fragments
EPSOIL-4	F44	0' - 1'	10/2001	4.5	---
SB-18	G44	0' - 1'	11/2001	6.25	---
SB-75	D35	0" - 6"	11/2002	1.3	---
		6" - 12"		0.67	Sand & Gravel
		1' - 2'		<0.58	Sand, Silt, Clay
		2' - 3'		<0.57	Sand, Silt, Clay
		3' - 4'		<0.61	Clay
SB-76	D35	0" - 6"	11/2002	0.73	---
		6" - 12"		<0.58	Clayey Silt
		1' - 2'		<0.61	Clayey Silt
		2' - 3'		1.2	Clayey Silt
		3' - 4'		<0.52	Silty Sand
SB-77	E36	0" - 6"	11/2002	18.9	Gravelly Sand
		6" - 12"		1.1	Gravelly Sand
		1' - 2'		<0.55	Gravelly Sand/Clayey Silt
		2' - 3'		<0.56	Clayey Silt/ Sand
		3' - 4'		<0.57	Silty Sand
SB-78	C37	3' - 4'	11/2002	<0.58	Clay
SB-79	C37	0" - 6"	11/2002	1.9	---
		6" - 12"		0.96	---
		1' - 2'		<0.57	Sandy Silt
		3' - 4'		1.2	Clay
SB-80	D40	0" - 6"	11/2002	11.7	---
		6" - 12"		7.3	---
		0' - 4'		18.4	Fill
		4' - 8'		22.6	Fill/Peat
		8' - 12'		<0.87	Peat/Sand and Gravel
SB-81	D40	2' - 3'	11/2002	1.6	Sand
		3' - 4'		<0.63	Clay
SB-82	D40	0" - 6"	11/2002	1.7	---
		6" - 12"		1.6	---
		1' - 2'		<0.61	Clayey Silt
		2' - 3'		1.6	Sandy Silt
		3' - 4'		1.3	Sandy Silt
SB-83	C40	0" - 6"	11/2002	<0.52	---
		6" - 12"		<0.51	---
		0' - 4'		<0.55	Clay/Fill
		4' - 8'		<0.65	Clay/Wood/Peat
SB-84	D42	2' - 3'	11/2002	11.4	Peat
		3' - 4'		<0.79	Sand
SB-211	D43	2' - 3'	11/2002	<0.56	Cobbles, Sand
		3' - 4'		<0.61	Sandy Silt

Table 2C
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Old Liverpool Road to Onondaga Lake Parkway

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SB-212	G44	0" - 6"	11/2002	8.0	---
		6" - 12"		2.6	Silty Sand
		1' - 2'		<0.59	Sandy Silt
		2' - 3'		<0.62	Sandy Silt
		3' - 4'		<0.75	Sandy Silt
SB-231	G43	0" - 6"	11/3/2003	1.0	Silty Sand
		6" - 12"		0.82	Silty Sand
		1' - 2'		0.72	Silty Sand
		2' - 3'		<0.60	Silty Sand
		3' - 4'		<0.64	Silty Sand
		4' - 5'		<0.63	Silty Sand to Organic Clayey Silt
		5' - 6'		<0.68	Organic Clayey Silt
		6' - 7'		<0.59	Organic Clayey Silt
		7' - 8'		<0.74	Sand/Gravel/ Shells
SB-232	G42	2' - 3'	11/3/2003	5.3	Silty Sand
		3' - 4'		<0.71	Silty Sand to Organic Clayey Silt
		4' - 5'		<0.70	Organic Clayey Silt
SB-418	E36	0" - 6"	11/3/2003	0.96	Fill
		6" - 12"		0.70	Fill
		1' - 2'		0.75	Fill
		2' - 3'		<0.55	Silty Sand/ Gravel
		3' - 4'		25.1	Silty Sand to Organic Clayey Silt
		4' - 5'		0.65	Organic Clayey Silt
SB-419	D36	0" - 6"	11/3/2003	1.8	Fill
		6" - 12"		0.8	Fill
		1' - 2'		1.7	Fill
		2' - 3'		0.58	Fill
		3' - 4'		2.5	Fill
		4' - 5'		1.3	Organic Clayey Silt
SB-420	D35	2' - 3'	11/3/2003	1.9	Fill
		3' - 4'		2.9	Fill to Organic Clayey Silt
		4' - 5'		1.1	Organic Clayey Silt
SB-421	D36	0" - 6"	11/3/2003	1.9	Fill
		6" - 12"		0.60	Fill
		1' - 2'		1.3	Fill
		2' - 3'		3.6 [3.1]	Fill
		3' - 4'		<0.54	Fill
		4' - 5'		<0.52	Silty Sand
SB-422	D36	2' - 3'	11/3/2003	0.62	Fill
		3' - 4'		1.2	Fill to Organic Clayey Silt
		4' - 5'		0.62	Organic Clayey Silt
SB-423	E36	0" - 6"	10/31/2003	<0.53	Asphalt
		6" - 12"		<0.52	Sand/Gravel
		0' - 2'		<0.54	Asphalt/ Sand/ Gravel/ Fill
		2' - 4'		<0.56	Fill
		4' - 6'		<0.56 [<0.28]	Fill to Sand
		6' - 8'		<0.63	Clay
SB-424	F36	0" - 6"	10/31/2003	<0.53	Asphalt
		6" - 12"		<0.57	Fill
		0' - 2'		<0.59	Fill
		2' - 4'		<0.57	Fill to Sand/Gravel/Cobbles
		4' - 6'		<0.58	Sand/Gravel/Cobbles to Silty Sand
		6' - 8'		<0.62	Silty Sand to Organic Silty Clay to Organic Clay
		8' - 10'		<0.61	Organic Clay
		10' - 12'		<0.61	Sand to Clay
SB-425	F36	0" - 6"	10/31/2003	<0.53	Asphalt
		6" - 12"		<0.55	Silty Sand/ Gravel/Cobbles
		0' - 2'		<0.54	Asphalt/ Silty Sand/ Gravel/Cobbles
		2' - 4'		<0.55	Silty Sand/ Gravel/Cobbles to Sand
		4' - 6'		22.0	Sand to Organic Clayey Silt
		6' - 8'		<0.63	Organic Clayey Silt to Clay
		8' - 10'		6.8	Silty Clay to Clay to Sand/Gravel to Clay to Sand with Shells
		10' - 12'		<0.59	Sand with shells to Clay
SB-426	F38	0" - 6"	10/31/2003	<0.58	Fill
		6" - 12"		<0.58	Fill
		0' - 2'		<0.56	Fill
		2' - 4'		<0.55 [<0.56]	Silt/Sand/ Gravel/Cobble
		4' - 6'		28.9	Organic Clayey Silt
		6' - 8'		21.1	Organic Clayey Silt
		8' - 10'		11.7	Organic Clayey Silt to Sand with Shells
		10' - 12'		<0.789	Clay to Organic Silty Clay to Silty Sand with Shells

Table 2C
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Old Liverpool Road to Onondaga Lake Parkway

Boring ID[1]	Figure Coordinates[2]	Sampling Interval	Collection Date	Result (mg/kg)	General Soil Classification
SB-427	F38	0" - 6"	10/31/2003	<0.59	Fill
		6" - 12"		<0.59	Fill
		0' - 2'		<0.58	Fill
		2' - 4'		<0.55	Fill
		4' - 6'		0.85	Fill to Gravel/Sand/ Ceramic
		6' - 8'		4.8	Organic Silty Clay
		8' - 10'		<0.750	Sand with shells to Clay
		10' - 12'		<0.832	Silty Clay, Wood at 10'
SB-428	F38	0" - 6"	10/31/2003	<0.57	Sand/Gravel/Cobbles
		6" - 12"		<0.55	Sand/Gravel/Cobbles
		0' - 2'		<0.54	Sand/Gravel/Cobbles
		2' - 4'		<0.55	Sand/Gravel/Cobbles
		4' - 6'		<0.56	Sand/Gravel/Cobbles
		6' - 8'		28.7	Organic Silty Clay (ceramics at 6'-6") to Clay
		8' - 10'		<0.693	Clay
		10' - 12'		1.02	Organic Silty Sand to Sand with Shells
SB-429	F40	0" - 6"	10/31/2003	<0.60	Fill
		6" - 12"		0.58	Fill
		0' - 2'		<0.54	Fill
		2' - 4'		<0.55	Fill
		4' - 6'		0.67 [0.62]	Clay
		6' - 8'		<0.54	Silty Sand/ Gravel, Organic Clay, Ceramics
		8' - 10'		5.7	Ceramics to Organic Clayey Silt
		10' - 12'		0.73	Organic Clayey Silt
		12' - 14'		0.99	Organic Clayey Silt
		14' - 16'		<0.71	Clay to Sand/Gravel/ Shells
SB-430	F40	0" - 6"	10/31/2003	<0.56	Fill
		6" - 12"		0.59	Fill
		0' - 2'		<0.57	Fill
		2' - 4'		0.57	Fill
		4' - 6'		<0.57	Fill
		6' - 8'		<0.55	Concrete to Sand/Gravel to Silty Sand
		8' - 10'		<0.59	Silty Sand
		10' - 12'		2.5	Gravel/Cobbles/Shells to Silty Clay
SB-431	G40	0" - 6"	10/31/2003	<0.54	Fill
		6" - 12"		<0.54	Fill
		0' - 2'		<0.54	Fill
		2' - 4'		3.0	Fill to Sand/Gravel
		4' - 6'		0.78	Silt/Sand/ Gravel to Fill
		6' - 8'		0.71	Fill
		8' - 10'		<0.57	Cobbles/Ceramic to Silty Sand to Ceramics
		10' - 12'		3.3	Organic Silty Clay
SB-432	F42	0" - 6"	11/3/2003	13.8	Organic Silt/Sand
		6" - 12"		<0.50	Organic Silt/Sand
		1' - 2'		3.0	Silty Sand
		2' - 3'		<0.64	Silty Sand
		3' - 4'		<0.75	Silty Sand to Organic Clayey Silt
		4' - 5'		<0.75	Sand/Gravel/ Shells
SB-433	E40	0" - 6"	10/31/2003	0.66	Fill
		6" - 12"		1.0	Fill
		0' - 2'		0.99	Fill
		2' - 4'		0.66	Fill
		4' - 6'		1.2	Fill
		6' - 8'		<0.57	Fill to Silty Sand/ Ceramics
		8' - 10'		0.8	Organic Clayey Silt
		10' - 12'		<0.70	Organic Clayey Silt
SB-434	E41	0" - 6"	10/31/2003	0.61	Fill
		6" - 12"		0.68	Fill
		0' - 2'		<0.57	Fill
		2' - 4'		1.9	Fill
		4' - 6'		1.3	Fill
		6' - 8'		1.3 [<0.54]	Fill to Silty Sand/ Ceramics
		8' - 10'		<0.78	Organic Clayey Silt/ Ceramics to Sand/Gravel/ Shells
		10' - 12'		<0.79	Sand/Gravel/ Shells

Notes:

1. Boring locations are shown on Figure 3C.
2. Figure coordinates correspond to coordinate system shown on Figure 3C.
3. Highlighted result indicates the presence of residual cadmium as defined in the SMP.
4. mg/kg = milligrams/kilograms (equivalent to ppm = parts per million).
5. Duplicate results are presented in brackets.
6. B - Compound was found in the blank and sample.
7. J - The detected concentration is an estimated value.
8. U - Result edited to reflect non-detect by data validation company due to presence of cadmium in the associated preparation blank at similar concentrations.
9. < - Analyte not detected at the reporting limit shown.
10. Any soil borings (the full boring or only down to a particular depth) that were fully removed during excavation activities have been omitted for this summary.

Table 2D
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Within the Roadway Adjacent to Culverts

Boring ID[1]	Figure Coordinates[2]	Sample Depth Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-82-01	F20	0' - 1'	4/29/2014	0.35	Gray coarse to fine sand and coarse to fine gravel
		1' - 2'	4/29/2014	0.9	Gray coarse to fine gravel, some fine sand, some Silt
		2' - 3'	4/29/2014	0.6	Brown silty clay, little sand
		3' - 4'	4/29/2014	2.3	Brown silty clay, little sand
		4' - 5'	4/29/2014	0.11	Brown clayey silt, some sand
		5' - 6'	4/29/2014	0.22	Brown clayey silt, some sand
		6' - 7'	4/29/2014	0.37	Brown clayey silt, some sand
		7' - 8'	4/29/2014	0.59	Brown clayey silt, some sand
		8' - 9'	4/29/2014	0.29	Gray coarse to fine gravel, some fine sand, some Silt
		9' - 10'	4/29/2014	0.11	Gray coarse to fine gravel, some fine sand, some silt
		10' - 11'	4/29/2014	4.8	Gray coarse to fine gravel, some fine sand, some silt
		11' - 12'	4/29/2014	0.18	Gray coarse to fine gravel, some fine sand, some silt
DI-82-02	F20	8' - 9'	4/29/2014	0.54 U	Brown clayey silt, some sand
		9' - 10'	4/29/2014	0.033	Brown clayey silt, some sand
		10' - 11'	4/29/2014	0.65 U	Brown clayey silt, some sand
		11' - 12'	4/29/2014	0.63 U	Brown clayey silt, some sand
DI-83-01	F20	0' - 1'	4/29/2014	0.12	Gray coarse to fine sand and coarse to fine gravel
		1' - 2'	4/29/2014	0.49	Gray medium to fine sand and medium to fine gravel
		2' - 3'	4/29/2014	19.1	Brown fine sand and silt, some clay
		3' - 4'	4/29/2014	5.8	Brown fine sand and silt, some clay
		4' - 5'	4/29/2014	16.6	Brown fine sand and silt, some clay
		5' - 6'	4/29/2014	14.4 [4.5]	Brown fine sand and silt, some clay
		6' - 7'	4/29/2014	1.3	Black fine sand and silt, some clay
		7' - 8'	4/29/2014	0.085	Black fine sand and silt, some clay
		8' - 9'	4/29/2014	0.16 [0.15]	Black fine sand and silt, some clay
		9' - 10'	4/29/2014	0.21	Black fine sand and silt
		10' - 11'	4/29/2014	0.15	Black fine sand and silt
		11' - 12'	4/29/2014	0.14	Black fine sand and silt
DI-83-02	F20	2' - 3'	4/29/2014	3.9	Dark brown to black sandy silt, some clay
		4' - 5'	4/29/2014	0.29	Dark brown to black sandy silt, some clay
		5' - 6'	4/29/2014	0.28	Dark brown to black sandy silt, some clay
DI-83-03	F20	0' - 1'	4/29/2014	0.19	Gray coarse to fine sand and medium to fine gravel
		1' - 2'	4/29/2014	0.63	Brown silty clay, little sand
		2' - 3'	4/29/2014	0.031	Brown clayey silt, little sand
		3' - 4'	4/29/2014	0.57 U	Brown clayey silt, little sand
		4' - 5'	4/29/2014	0.2	Brown sandy silt, some clay
DI-84-01	C16	0' - 1'	12/2/2014	0.17 J	Red brown fine-coarse sand, some angular gravel
		1' - 2'	12/2/2014	0.52	Brown silty clay, trace fine sand
		2' - 3'	12/2/2014	7.2	Brown clayey silt, little fine sand
		3' - 4'	12/2/2014	3.2	Brown fine-coarse sand, little angular gravel
		4' - 5'	12/2/2014	0.16 J	Brown clayey silt 4-4.5' Brown clay, little silt 4.5-5'
		5' - 6'	12/2/2014	0.94	Brown clay, some silt, little sub angular gravel
		6' - 7'	12/2/2014	0.4 J [1.1 J]	Brown clayey silt, some fin sand, little subangular gravel
		7' - 8'	12/2/2014	0.82	Brown fine silty sand, trace clay, clay increase with depth
		8' - 9'	12/2/2014	<0.27	Brown silt clay, trace fine sand
		9' - 10'	12/2/2014	0.19 J	Brown clay, little silt
		10' - 11'	12/2/2014	10.9	Brown clay, little silt, trace sub angular gravel
		11' - 12'	12/2/2014	0.051 J	Red brown fine sand, little silt
DI-84-02	C16	2' - 3'	12/2/2014	3.8	Brown clayey silt, little course sand
		3' - 4'	12/2/2014	0.11 J	Brown silty clay, some fine-course sand
		10' - 11'	12/2/2014	<0.27	Brown fine sand, some silt, little clay
DI-84-03	C16	2' - 3'	12/2/2014	0.14 J	Dark brown silty clay
DI-85-01	C15	0' - 1'	12/2/2014	0.3 B	Red brown fine-coarse sand, little angular gravel
		2' - 3'	12/2/2014	25.7 B	Red brown fine- med. sand, little rounded gravel, clay lense at 2.2'
		3' - 4'	12/2/2014	36.9 B	Brown fine silty sand, little clay
		4' - 5'	12/2/2014	80.2 B	Dark brown fine sandy silt, little clay, little med.-course sand
		5' - 6'	12/2/2014	71 B	Dark brown fine sandy silt, little clay, trace med.-course sand
		6' - 7'	12/2/2014	0.78 B	Dark brown clayey silt, little fine-med. Sand, increase in clay with depth
		7' - 8'	12/2/2014	0.5 B	Brown fine silty sand
		8' - 9'	12/2/2014	0.38 J [0.20 J]	Brown fine silty sand
		9' - 10'	12/2/2014	48.6	Brown silty clay, trace sub angular gravel
		10' - 11'	12/2/2014	0.42	Brown fine sand silt, trace med. Sand
		11' - 12'	12/2/2014	0.53 J [0.43 J]	Brown fine sandy silt, trace med. Sand. Fine sand lens at 11.8'
DI-85-02	D15	1' - 2'	12/2/2014	39.5	Dark brown sandy silt, little clay
		3' - 4'	12/2/2014	5.4	Brown fine sandy silt, some clay
		4' - 5'	12/2/2014	143	Brown fine sandy silt, little clay
		5' - 6'	12/2/2014	1.7	Dark brown silty sand, little clay, clay decreasing with depth
		9' - 10'	12/2/2014	0.085 J	Brown silty clay, little fine sand

Table 2D
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Within the Roadway Adjacent to Culverts

Boring ID[1]	Figure Coordinates[2]	Sample Depth Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-85-03	D15	1' - 2'	12/2/2014	0.097 J	Brown fine silty sand, trace clay, clay increase with depth
		2' - 3'	12/2/2014	0.33	Brown sandy silt, little clay, little rounded gravel
		3' - 4'	12/2/2014	0.13 J	Brown sandy silt, little clay, little rounded gravel
		4' - 5'	12/2/2014	0.31	Dark brown clayey silt, little fine sand
DI-86-01	F23	0' - 1'	12/3/2014	5.9	Dark brown fine sandy silt, little coarse sand
		2' - 3'	12/3/2014	2.6	Dark brown fine sandy silty little clay
		3' - 4'	12/3/2014	3.1	Dark brown fine sandy silty little clay
		4' - 5'	12/3/2014	2.6	Brown silt, little rounded gravel, trace clay
		5' - 6'	12/3/2014	3.8	Brown silt, some fine-course sand
		6' - 7'	12/3/2014	0.42	Grey fine silty sand, trace clay 6-6.7'. Light brown fine silty sand 6.7'-7'
		7' - 8'	12/3/2014	0.35	Brown fine sandy silt
		8' - 9'	12/3/2014	0.47	Brown fine sandy silt
		9' - 10'	12/3/2014	0.25 J	Dark brown fine silty sand, wet.
		10' - 11'	12/3/2014	0.39	Pinkish-brown silty clay, trace fine sand
		11' - 12'	12/3/2014	0.30	Pinkish-brown silty clay, trace fine sand
DI-86-02	F23	0' - 1'	12/3/2014	0.19 J	Grey-brown silt, little fine sand, trace clay
		1' - 2'	12/3/2014	0.10 J	Subangular and angular gravel, little fine-coarse sand
		2' - 3'	12/3/2014	0.074 J	Brown fine-course sand, little angular gravel (fill)
DI-86-03	F23	3' - 4'	12/3/2014	<0.28	Light brown silt, little clay, little pure sand
		4' - 5'	12/3/2014	<0.28	Light brown silt, some fine sand
		5' - 6'	12/3/2014	<0.26	Light brown silt, some fine sand
DI-87-01	G22	0' - 1'	12/3/2014	0.073 J	Dark brown fine sandy silt, trace clay, increase clay with depth
		1' - 2'	12/3/2014	0.12 J	Dark brown silty clay, little fine sand
		2' - 3'	12/3/2014	1.2	Brown fine sandy silt 2-2.5' Black fine sandy silt 2.5-3'
		3' - 4'	12/3/2014	32.8	Black fine sandy silt
		4' - 5'	12/3/2014	0.73	Dark brown fine sandy silt, trace clay, increase clay with depth
		5' - 6'	12/3/2014	0.29	Brown silty clay, trace fine sand
		6' - 7'	12/3/2014	2.9	Brown fine sandy silt, little clay
		7' - 8'	12/3/2014	0.12 J	Brown fine sandy silt, trace clay
		8' - 9'	12/3/2014	0.43	Brown fine sandy silt, trace clay
		9' - 10'	12/3/2014	0.25 J	Brown fine silty sand
		10' - 11'	12/3/2014	1.7	Brown silt, some fine sand, trace clay
		11' - 12'	12/3/2014	0.07 J	Brown fine silty sand, trace clay
DI-87-02	G22	3' - 4'	12/3/2014	1.7	Brown clayey silt, little fine sand, decrease in clay with depth
		6' - 7'	12/3/2014	0.079 J	Brown clayey silt, trace fine sand
DI-88-02	G26	0' - 1'	12/5/2014	0.53	Brown silt, some F-M angular gravel, little F-sand
		1' - 2'	12/5/2014	2.1	Dark brown clay, some silt, trace F-sand
		2' - 3'	12/5/2014	0.33	Light brown clay, little salt
		4' - 5'	12/5/2014	0.039 J	Brown clay, little silt; gravel lense at 4.5'-5.0'
		5' - 6'	12/5/2014	0.074 J	Tan clay, trace silt; large rock at 5.5'-6.0'
		6' - 7'	12/5/2014	0.079 J	Tan clay, trace silt; large rock at 5.5'-6.0'
		7' - 8'	12/5/2014	0.064 J	Tan clay, trace silt; large rock at 5.5'-6.0'
		8' - 9'	12/5/2014	1.5	Dark brown clay, trace silt
		9' - 10'	12/5/2014	0.07 J	Dark brown clay, trace silt; gravel lense
		10' - 11'	12/5/2014	0.067 J	Tan clay, trace silt
		11' - 12'	12/5/2014	0.053 J	Tan clay, trace silt
DI-88-03	G26	3' - 4'	12/5/2014	0.99	Dark brown clay, some silt, little F-sand
DI-89-01	G26	0' - 1'	12/2/2014	0.63 J [1.5 J]	Brown fine silty sand, some clay.
		1' - 2'	12/2/2014	1.6 B	Brown silt, some clay, trace rounded gravel
		2' - 3'	12/2/2014	0.82 B	Brown silt, some clay, little angular gravel (slough)
		3' - 4'	12/2/2014	0.8 B	Brown clayey silt, trace sub angular gravel
		4' - 5'	12/2/2014	1.2 B	Brown clayey silt, trace sub angular gravel
		5' - 6'	12/2/2014	0.77 B [0.043 J]	Brown silty clay , little fine sand
		6' - 7'	12/2/2014	0.49 J	Brown silty clay, little fine sand
		7' - 8'	12/2/2014	0.56 B	Brown clayey silt, some fine sand
		8' - 9'	12/2/2014	0.4 B	Brown clayey silt, increasing clay with depth, trace fine sand.
		9' - 10'	12/2/2014	0.45 B	Brown silty clay, lenses of fine sand throughout
		10' - 11'	12/2/2014	0.4 B	Brown silty clay, little angular gravel, wet.
		11' - 12'	12/2/2014	0.38 B	Brown silty clay, little fine sand
DI-90-01	C29	0' - 1'	12/1/2014	0.051 J	Brown silty clay with some rounded gravel
		3' - 4'	12/1/2014	0.087 J	Brown silty clay with some rounded gravel
		4' - 5'	12/1/2014	0.072 J	Brown fine to coarse sand little angular gravel
		5' - 6'	12/1/2014	0.076 J	Brown fine to coarse sand little angular gravel
		6' - 7'	12/1/2014	0.083 J	Brown fine to coarse sand little angular gravel
		7' - 8'	12/1/2014	0.09 J	Brown fine silty sand little clay
		8' - 9'	12/1/2014	0.12 J [0.14 J]	Brown fine silty sand little clay
		9' - 10'	12/1/2014	0.078 J	Light brown fine silty sand some clay fine sand lense 9'-9.2'
		10' - 11'	12/1/2014	0.11 J	Gray fine sandy silt, little clay
		11' - 12'	12/1/2014	0.14 J	Bark brown fine sand little silt, red mottling

Table 2D
Bloody Brook
Post-Remediation Soil Cadmium Concentrations Remaining on Site
Within the Roadway Adjacent to Culverts

Boring ID[1]	Figure Coordinates[2]	Sample Depth Interval	Collection Date	Result (mg/kg)	General Soil Classification
DI-90-02	C29	1' - 2'	12/1/2014	0.041 J	Angular gravel and coarse sand (slough from pavement)
		2' - 3'	12/1/2014	1.3	Angular gravel and coarse sand (slough from pavement)
DI-91-01	C30	0' - 1'	12/1/2014	0.86	Brown fine-coarse sand, trace clay
		1' - 2'	12/1/2014	8.5	Dark brown fine sand, little silt
		2' - 3'	12/1/2014	0.30	Dark brown fine sand, little silt
		3' - 4'	12/1/2014	0.11 J	Brown fine sand, little silt, trace sub-angular gravel
		4' - 5'	12/1/2014	0.67	Brown fine sand, some silt
		5' - 6'	12/1/2014	0.27	Gray fine sand, some clay
		6' - 7'	12/1/2014	0.44	Gray fine sand, some clay
		7' - 8'	12/1/2014	0.41	Gray fine sand, some clay
		8' - 9'	12/1/2014	0.39	Brown fine sand, little soil, wet
		9' - 10'	12/1/2014	0.22 J	Brown fine silty sand, trace clay
		10' - 11'	12/1/2014	0.53 J [0.070 J]	Brown fine silty sand, trace clay
DI-91-02	C30	1' - 2'	12/1/2014	0.72	Red-brown fine to coarse sand, little clay

Notes:

1. Boring locations are shown on Figure s 3A through 3C.
2. Figure coordinates correspond to coordinate system shown on Figures 3A through 3C.
3. Highlighted result indicates the presence of residual cadmium as defined in the SMP.
4. mg/kg = milligrams/kilograms (equivalent to ppm = parts per million).
5. Duplicate results are presented in brackets.
6. B - Compound was found in the blank and sample.
7. J - The detected concentration is an estimated value.
8. U - Result edited to reflect non-detect by data validation company due to presence of cadmium in the associated preparation blank at similar concentrations.
9. < - Analyte not detected at the reporting limit shown.

Table 3
Bloody Brook
Summary of Required Institutional Control Notifications

Frequency	Notification From/To	Purpose
Annual	Lockheed Martin to property owners who chose to decline remedy implementation and/or sampling on their property.	Offer to implement the remedy
Annual	Lockheed Martin to property owners with post remedy residual soil contamination (including commercial, residential, and municipal properties).	Reminder of the presence of residual contamination and of Lockheed Martin's commitment to handle (excavate, manage and dispose) residual contaminated soils, as necessary and in accordance with the intended use of the property.
Ongoing	Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development to Lockheed Martin	Any building permits they grant for properties within the site boundaries where residual material remains post remedy.
Ongoing	Onondaga County to Lockheed Martin	Any Town or County plans to conduct intrusive maintenance work within the site boundaries (e.g., soil disturbance work).

Table 4
Bloody Brook
Contact Information for Village of Liverpool Code Enforcement Office and the Town of Salina Department of Planning and Development Notifications

Contact Name/Title	Phone Number(s)	Email Address
Jill Fonte Environmental Engineer Lockheed Martin Corporation	315-456-1993 desk 315-944-8082 cell 315-456-3723 (ESH Admin)	jill.a.fonte@lmco.com
Mark Lafaver Town of Salina Department of Planning and Development	315-451-0492	MLafaver@salina.ny.us
Bill Raegan Village of Liverpool Code Enforcement Office	315-457-3441 x4	codes@villageofliverpool.org
Jacky Luo New York State Department of Environmental Conservation	518-402-9676	jacky.luo@dec.ny.gov
Mark Sergott, P.G. New York State Department of Health	518-402-7860	beei@health.ny.gov

*See SMP Section 3.2.1

Table 5
Bloody Brook
Contact information for Onondaga County Notifications

Contact Name/Title	Phone Number(s)	Email Address
Jill Fonte Environmental Engineer Lockheed Martin Corporation	315-456-1993 desk 315-944-8082 cell 315-456-3723 (ESH Admin)	jill.a.fonte@lmco.com
Bob Pezzimenti, Esq. General Counsel Lockheed Martin Corporation	315-456-3916	robert.pezzimenti@lmco.com
Nicolas Capozza Department of Water Environment Protection Onondaga County	315-435-2260	NickCapozza@ongov.net
Benjamin Yaus Department of Law Onondaga County	315-435-2170 x5918	BenjaminYaus@ongov.net
Jacky Luo New York State Department Environmental Conservation	518-402-9676	jacky.luo@dec.ny.gov
Mark Sergott, P.G. New York State Department of Health	518-402-7860	beei@health.ny.gov

*See SMP Section 3.2.1

Table 6
Bloody Brook
Monitoring/Inspection Schedule

Monitoring Program	Frequency	Purpose
Site-Wide Institutional Control Certification	Annually	Ensure Institutional Controls are being properly implemented.
Site-Wide Engineering Control Inspections	Annually	Inspection of the soil cover to ensure no erosion is occurring.
Restoration Monitoring[1]	Annually for five years	Ensure no erosion of the channel and banks is occurring and that vegetation is growing as intended.
Biological Monitoring[2]	Two and four years following remediation (summer 2018 and 2020)	Document cadmium concentrations in aquatic biota following completion of remedial activities.

1. See Section 4.2 of the Site Management Plan for schedule.
2. Biological monitoring will include the collection of crayfish from the brook channel for analysis of total cadmium by SW-846 EPA Method 6020A. This is the only chemical analysis that is anticipated during monitoring activities unless the collection of soil sampling becomes necessary as discussed in Section 3 of the Site Management Plan.

Table 7
Analytical Data for Baseline (July 2014) and First Year Post-Remediation (August 2018) Biota Monitoring
Bloody Brook
Onondaga County, New York

Sample Location	Sample Location	2014 Cadmium (mg/kg-ww)	2018 Cadmium (mg/kg-ww)	Sample Location Start		Sample Location End	
				Northing	Easting	Northing	Easting
Upper Channel - between Ontario Place and Cranberry Drive	CR-1-01	3.1	0.53	1131978.925	923602.724	1132094.739	923709.624
	CR-1-02	3.6	0.56				
	CR-1-03	3.2	1.3				
	CR-1-04	2.5	0.76				
	CR-1-05	4.4					
	Average	3.4	0.79				
Middle Channel - downstream from Floradale Road	CR-2-01	4.3	Not sampled	1130529.201	922854.378	1130680.907	923003.430
	CR-2-02	3.5	Not sampled				
	CR-2-03	5.2	Not sampled				
	CR-2-04	3.6	Not sampled				
	CR-2-05	3.5	Not sampled				
	Average	4.0	No samples				
Lower Channel-upstream from Onondaga Lake Parkway	CR-3-01	0.97	0.059 J	1128853.259	922571.533	1128930.078	922690.995
	CR-3-02	0.76	0.13				
	CR-3-03	1.3	0.12				
	CR-3-04	1.5	0.22				
	CR-3-05	0.33	0.18				
	Average	0.97	0.16				

Notes:

1.Biota samples were whole body crayfish.

2. Results are reported in wet weight.

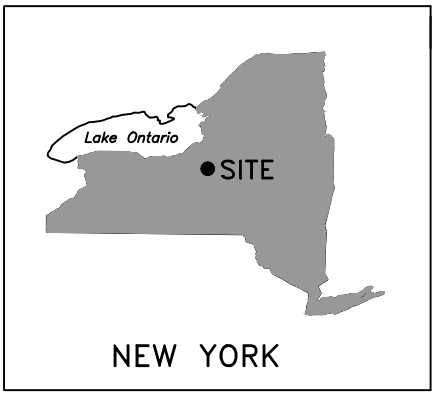
3. No crayfish were located in the "middle" sample from 2018.

4. J - estimated value; detected above the method detection limit but below the reporting limit.

Table 8
Bloody Brook
Reporting Summary/Schedule

Task/Report	Reporting Frequency
Periodic Review Report	Annually
Restoration Monitoring Report	Annually for five years
Biological Monitoring Report	Two and four years following remediation (summer/fall 2018 and 2020)

FIGURES



0' 2000' 4000'

APPROXIMATE SCALE

REFERENCE:

1. NYSDOT 7.5 MIN TOPOGRAPHIC MAP OF SYRACUSE WEST, QUADRANGLE 1990, SCALE: 1" = 2000'.

AECOM

LOCKHEED MARTIN CORPORATION

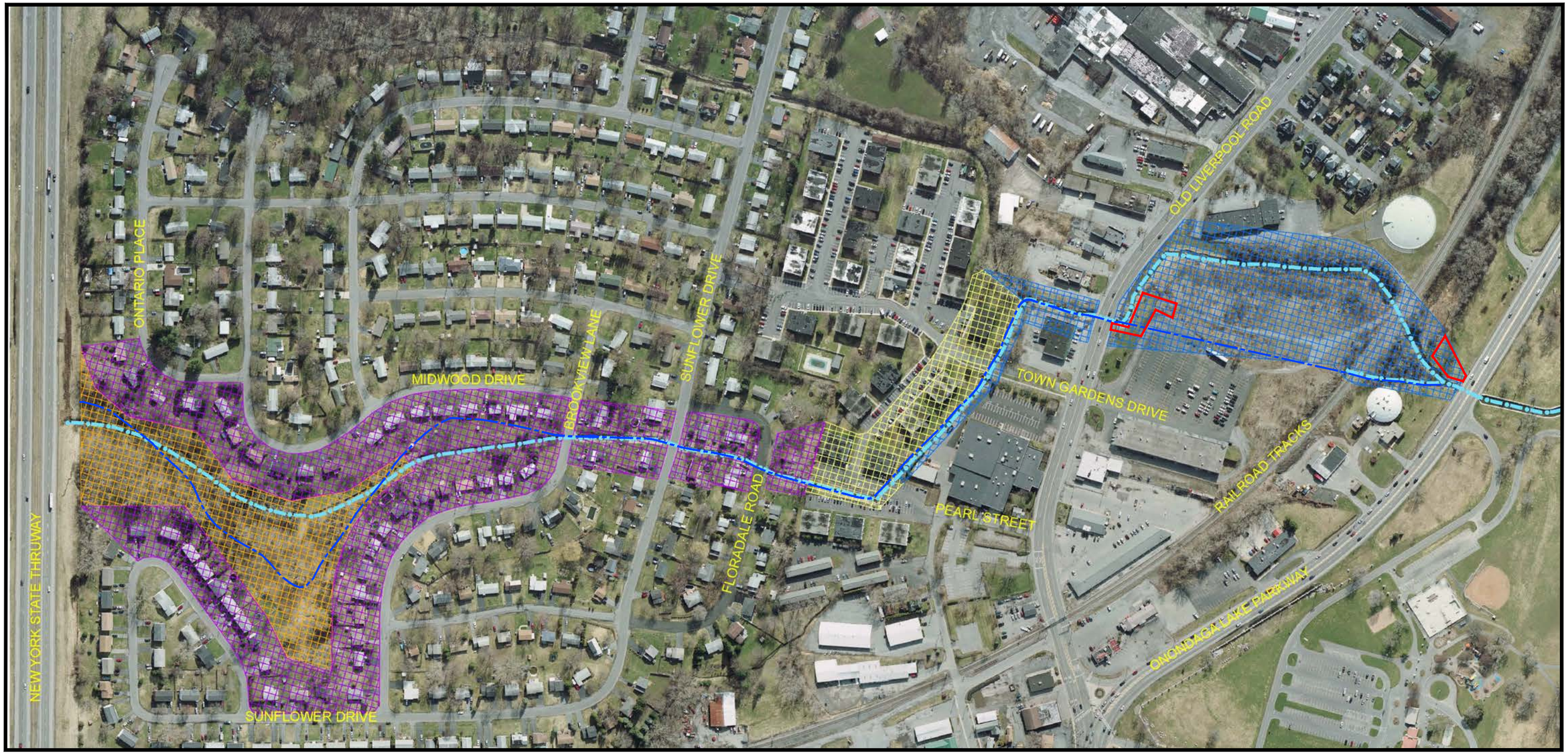
SITE LOCATION MAP

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG1.dwg	RNB	60544270	2 / 2018	1

Plotted By: Bookasr
Layout-Sheet Name: LAYOUT1
Plot File Date Created: Feb/12/2018 11:27 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG1.DWG



Legend

- CURRENT BROOK ALIGNMENT
- WOODED AREA
- RESIDENTIAL AREA
- APARTMENT COMPLEX AREA
- COMMERCIAL-LIGHT INDUSTRIAL AREA
- COMMERCIAL AREAS EXCLUDED FROM MAY 2017 MONITORING

0' 300' 600'

APPROXIMATE SCALE

AECOM

LOCKHEED MARTIN CORPORATION

SITE AREA MAP

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG2.dwg	RNB	60544270	2 / 2018	2

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 1-2
Plot File Date Created: Feb/12/2018 11:29 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG2.DWG

LEGEND

Symbol	Description
	WETLANDS
	BLOODY BROOK DRAINAGE DISTRICT EASEMENT
	NEW YORK STATE THRUWAY EASEMENT
	PROPERTY BORDER
365	TOPOGRAPHIC CONTOUR LINE
	CENTERLINE OF CHANNEL
	STREAM/WATER EDGE
	CULVERT
	LOCATION HISTORIC BROOK ALIGNMENT
DI-84-01	SOIL BORING FOR USE IN CULVERT REPLACEMENT WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 10 mg/kg)
DI-84-02	SOIL BORING FOR USE IN CULVERT REPLACEMENT WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 10 mg/kg OR LESS)
SB-204	EASEMENT SAMPLING LOCATION WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 10 mg/kg BELOW 2 FEET)
SB-26	EASEMENT SAMPLING LOCATION WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 10 mg/kg OR LESS)
DI-01-01	RESIDENTIAL SAMPLING LOCATION WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 10 mg/kg BELOW 2 FEET)
DI-02-02	RESIDENTIAL SAMPLING LOCATION WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 2.5 mg/kg OR LESS IN THE TOP 2 FEET AND 10 mg/kg OR LESS BELOW 2 FEET)
SB-409	WOODED AREA SAMPLING LOCATION WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 4 mg/kg IN THE TOP 2 FEET AND /OR 10 mg/kg BELOW 2 FEET)
SB-408	WOODED AREA SAMPLING LOCATION WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 4 mg/kg OR LESS IN THE TOP 2 FEET AND 10 mg/kg OR LESS BELOW 2 FEET)
SB-63	SAMPLING LOCATION FULLY REMOVED DURING EXCAVATION ACTIVITIES
	LIMITS OF EXCAVATION (2 FT MAX DEPTH BGS)
	LIMITS OF EXCAVATION WITHIN EXISTING BROOK CHANNEL
	LIMITS OF EXCAVATION (3FT DEPTH BGS)
	LIMITS OF EXCAVATION (4FT DEPTH BGS)
	LIMITS OF EXCAVATION (5FT DEPTH BGS)
	LIMITS OF EXCAVATION (6FT DEPTH BGS)

NOTE

1. SEE FIGURE 3C FOR IDENTIFICATION OF ADDITIONAL MAP SYMBOLS.

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

0' 50' 100'
APPROXIMATE SCALE

AECOM

LOCKHEED MARTIN CORPORATION
POST-REMEDIATION
RESIDUAL CADMIUM
SHEET 1 OF 3
BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG3.dwg	RNB	60544270	2 / 2018	3A

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 3A
Plot File Date Created: Feb/13/2018 9:52 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG3.DWG

LEGEND

- TOWN/VILLAGE BORDER
- LOCATION HISTORIC BROOK ALIGNMENT
- DI-84-01 — SOIL BORING FOR USE IN CULVERT REPLACEMENT WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 10 mg/kg)
- DI-84-02 — SOIL BORING FOR USE IN CULVERT REPLACEMENT WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 10 mg/kg OR LESS)
- SB-417 — EXISTING SAMPLING LOCATION WITHIN APARTMENT COMPLEX PROPERTY WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 10 mg/kg BELOW 2 FEET)
- B-7 — EXISTING SAMPLING LOCATION WITHIN APARTMENT COMPLEX PROPERTY WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 4.3 mg/kg OR LESS IN THE TOP 2 FEET AND 10 mg/kg OR LESS BELOW 2 FEET)
- SB-209 — EASEMENT SAMPLING LOCATION WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 10 mg/kg BELOW 2 FEET)
- SB-72 — EASEMENT SAMPLING LOCATION WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 10 mg/kg OR LESS)
- DI-06-01 — RESIDENTIAL SAMPLING LOCATION WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 10 mg/kg BELOW 2 FEET)
- DI-06-02 — RESIDENTIAL SAMPLING LOCATION WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 2.5 mg/kg OR LESS IN THE TOP 2 FEET AND 10 mg/kg OR LESS BELOW 2 FEET)
- SB-12 — COMMERCIAL SAMPLING LOCATION WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 9.3 mg/kg OR LESS)
- SB-63 — SAMPLING LOCATION FULLY REMOVED DURING EXCAVATION ACTIVITIES
- LIMITS OF EXCAVATION (2 FT MAX DEPTH BGS)
- LIMITS OF EXCAVATION WITHIN EXISTING BROOK CHANNEL
- LIMITS OF EXCAVATION (4FT DEPTH BGS)

NOTE

1. SEE FIGURE 3C FOR IDENTIFICATION OF ADDITIONAL MAP SYMBOLS.

0' 50' 100'
APPROXIMATE SCALE

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

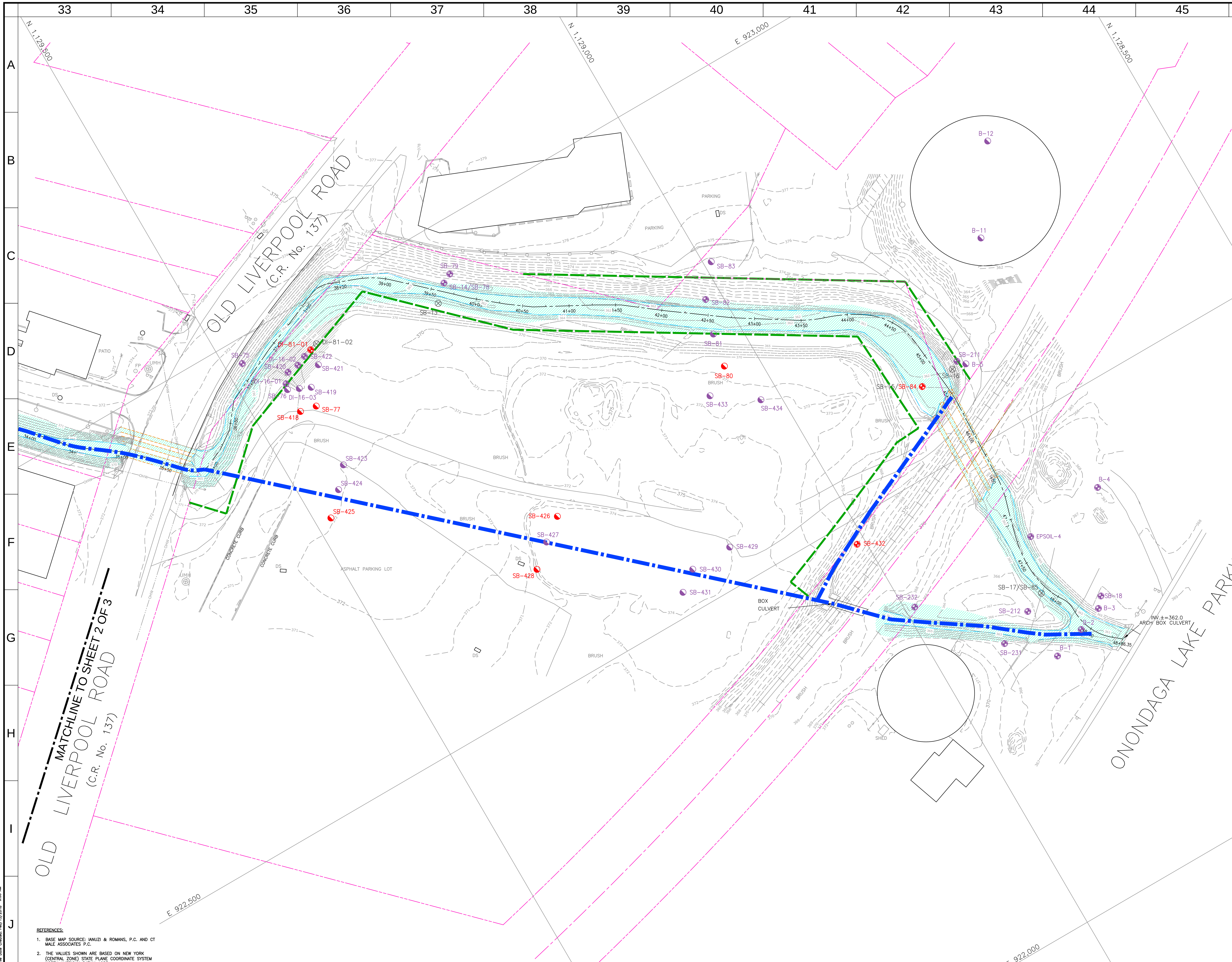
AECOM

LOCKHEED MARTIN CORPORATION
POST-REMEDIATION
RESIDUAL CADMIUM
SHEET 2 OF 3
BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG3.dwg	RNB	60544270	2 / 2018	3B

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 3B
Plot File Date Created: Feb/13/2018 1:09 PM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG3.DWG



LEGEND

- BLOODY BROOK DRAINAGE DISTRICT EASEMENT
- PROPERTY BORDER
- 365 TOPOGRAPHIC CONTOUR LINE
- CENTERLINE OF CHANNEL
- STREAM/WATER EDGE
- UNDERGROUND DRAIN LINE
- OHW OVERHEAD WIRES
- RW RETAINING WALL
- GUARD RAIL
- UMH UTILITY MANHOLE
- DMH DRAINAGE MANHOLE
- SMH SANITARY MANHOLE
- RAILROAD TRACKS
- CB CATCH BASIN
- DS DS DRAINAGE STRUTURES
- FP FLAG POLE
- CULVERT
- E 924,000 NYS PLANE COORDINATE SYSTEM EASTING
- N 1,131,000 NYS PLANE COORDINATE SYSTEM NORTHING
- BL-115 AERIAL SURVEY GROUND CONTROL POINT
- 7+50 CHANNEL CENTERLINE SURVEY STATION
- 367.4 × TOPOGRAPHIC SPOT ELEVATION
- CONIFEROUS TREE
- DECIDUOUS TREE
- LIGHT POLE
- UTILITY POLE / GUY WIRE
- LOCATION HISTORIC BROOK ALIGNMENT
- LIMITS OF EXCAVATION (2 FT MAX DEPTH BGS)
- LIMITS OF EXCAVATION WITHIN EXISTING BROOK CHANNEL
- SB-84 EASEMENT SAMPLING LOCATION WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 10 mg/kg BELOW 2 FEET)
- SB-420 EASEMENT SAMPLING LOCATION WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 10 mg/kg OR LESS)
- SB-80 COMMERCIAL SAMPLING LOCATION WITH RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS EXCEEDING 9.3 mg/kg IN THE TOP 2 FEET AND/OR EXCEEDING 10 mg/kg BELOW 2 FEET)
- SB-75 COMMERCIAL SAMPLING LOCATION WITHOUT RESIDUAL CADMIUM (CADMIUM CONCENTRATIONS 9.3 mg/kg OR LESS IN THE TOP 2 FEET AND 10 mg/kg OR LESS BELOW 2 FEET)
- SB-13 SAMPLING LOCATION FULLY REMOVED DURING EXCAVATION ACTIVITIES

0' 50' 100'
APPROXIMATE SCALE

AECOM

LOCKHEED MARTIN CORPORATION
POST-REMEDIATION
RESIDUAL CADMIUM
SHEET 3 OF 3
BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG3.dwg	RNB	60544270	2 / 2018	3C

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 3C
Plot File Date Created: Feb/13/2018 9:53 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG3.DWG

LEGEND

- WETLANDS
- BLOODY BROOK DRAINAGE DISTRICT EASEMENT
- PROPERTY BORDER
- TOPOGRAPHIC CONTOUR LINE
- CENTERLINE OF CHANNEL
- STREAM/WATER EDGE
- CULVERT
- LOCATION HISTORIC BROOK ALIGNMENT
- NYS THRUWAY EASEMENT
- INSTITUTIONAL CONTROL AREA

0' 50' 100'
APPROXIMATE SCALE

NOTE

1. SEE FIGURE 4C FOR IDENTIFICATION OF ADDITIONAL MAP SYMBOLS.

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

AECOM

LOCKHEED MARTIN CORPORATION

INSTITUTIONAL CONTROL AREA
SHEET 1 OF 3

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG4.dwg	RNB	60544270	2 / 2018	4A

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 4A
Plot File Date Created: Feb/13/2018 9:54 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG4.DWG

LEGEND

- TOWN/VILLAGE BORDER
- LOCATION HISTORIC BROOK ALIGNMENT
- INSTITUTIONAL CONTROL AREA

NOTE

1. SEE FIGURE 4C FOR IDENTIFICATION OF ADDITIONAL MAP SYMBOLS.

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

AECOM

LOCKHEED MARTIN CORPORATION

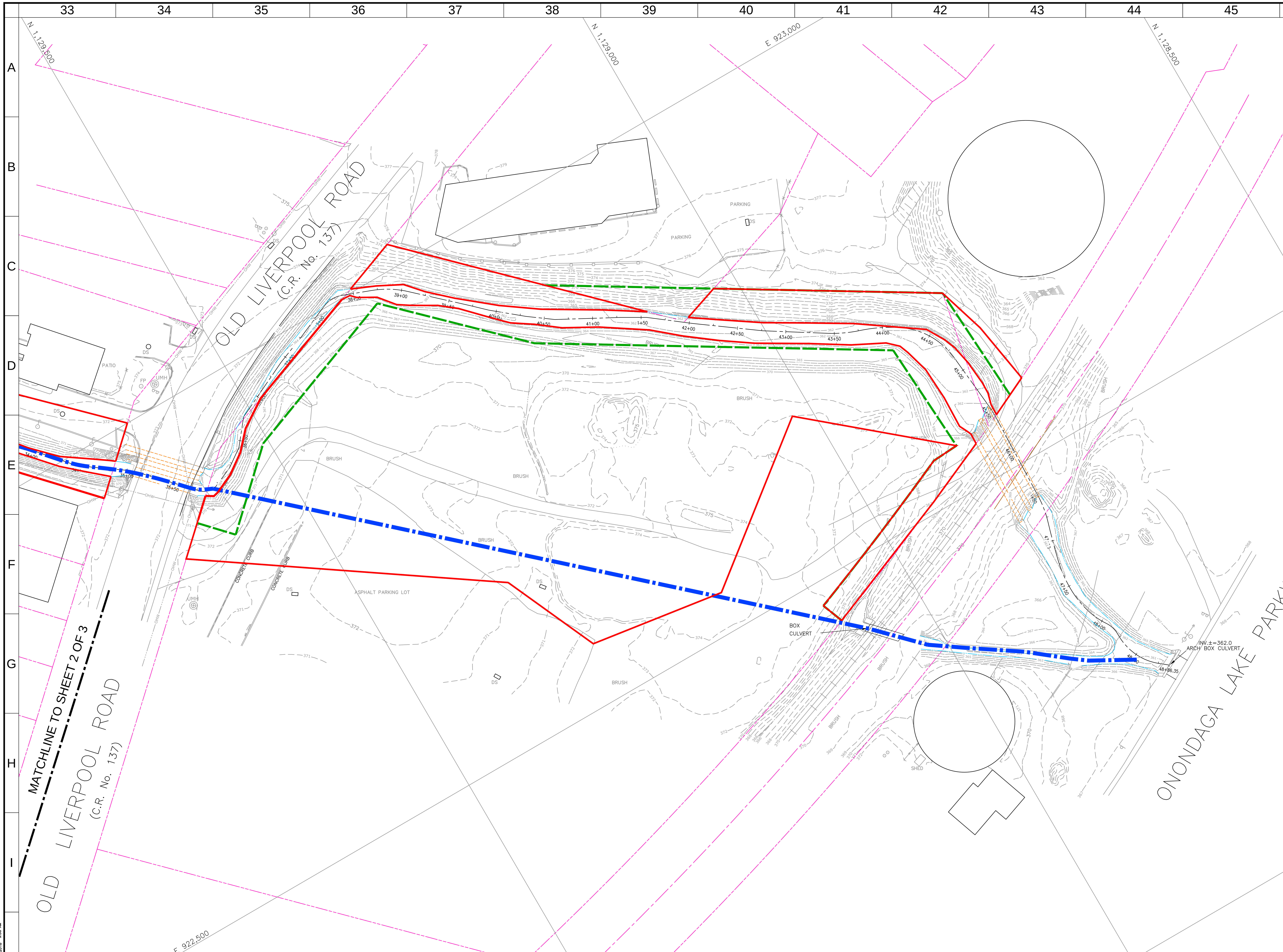
INSTITUTIONAL CONTROL AREA
SHEET 2 OF 3

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG4.dwg	RNB	60544270	2 / 2018	4B

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 4B
Plot File Date Created: Feb/13/2018 1:11 PM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG4.DWG



LEGEND

- BLOODY BROOK DRAINAGE DISTRICT EASEMENT
- PROPERTY BORDER
- TOPOGRAPHIC CONTOUR LINE
- CENTERLINE OF CHANNEL
- STREAM/WATER EDGE
- UNDERGROUND DRAIN LINE
- OVERHEAD WIRES
- RETAINING WALL
- GUARD RAIL
- UMH UTILITY MANHOLE
- DMH DRAINAGE MANHOLE
- SMH SANITARY MANHOLE
- RAILROAD TRACKS
- CB CATCH BASIN
- DS DRAINAGE STRUTURES
- FP FLAG POLE
- CULVERT
- E 924,000 NYS PLANE COORDINATE SYSTEM EASTING
- N 1,131,000 NYS PLANE COORDINATE SYSTEM NORTHING
- BL-115 AERIAL SURVEY GROUND CONTROL POINT
- 7+50 + CHANNEL CENTERLINE SURVEY STATION
- 367.4 × TOPOGRAPHIC SPOT ELEVATION
- CONIFEROUS TREE
- DECIDUOUS TREE
- LIGHT POLE
- UTILITY POLE / GUY WIRE
- LOCATION HISTORIC BROOK ALIGNMENT
- INSTITUTIONAL CONTROL AREA

0' 50' 100'
APPROXIMATE SCALE

AECOM

LOCKHEED MARTIN CORPORATION
INSTITUTIONAL CONTROL AREA
SHEET 3 OF 3

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG4.dwg	RNB	60544270	2 / 2018	4C

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.

2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 4C
Plot File Date Created: Feb/13/2018 9:56 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG4.DWG


ONTARIO PLACE
MIDWOOD DRIVE
CRANBERRY DRIVE
MIDWOOD DRIVE
MATCHLINE TO SHEET 2 OF 3
NEW YORK STATE THRUWAY
SUNFLOWER DRIVE
BROOKVIEW LANE
BOX CULVERT INV.=384.4
INV.12"CSP=397.23
HIGHWAY BOUNDARY
CHAIN LINK FENCE
N 1,132,000
N 1,131,500
N 1,132,500
E 924,000
E 923,500
E 923,000
E 923
LEGEND
WETLANDS
BLOODY BROOK DRAINAGE DISTRICT EASEMENT
PROPERTY BORDER
TOPOGRAPHIC CONTOUR LINE
CENTERLINE OF CHANNEL
STREAM/WATER EDGE
CULVERT
LOCATION HISTORIC BROOK ALIGNMENT
NYS THRUWAY EASEMENT
ENGINEERING CONTROL AREA
0' 50' 100'
APPROXIMATE SCALE
NOTE
1. SEE FIGURE 5C FOR IDENTIFICATION OF ADDITIONAL MAP SYMBOLS.
REFERENCES:
1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.
LOCKHEED MARTIN CORPORATION
ENGINEERING CONTROL AREA
SHEET 1 OF 3
BLOODY BROOK
ONONDAGA COUNTY, NEW YORK
FILE NAME: SMP_FIG5.dwg
DRN RNB
PROJECT NO. 60544270
DATE 2 / 2018
FIGURE NO. 5A

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 5A
Plot File Date Created: Feb/13/2018 9:57 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG5.DWG

LEGEND

- TOWN/VILLAGE BORDER
- LOCATION HISTORIC BROOK ALIGNMENT
- ENGINEERING CONTROL AREA

NOTE

1. SEE FIGURE 5C FOR IDENTIFICATION OF ADDITIONAL MAP SYMBOLS.

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

0' 50' 100'
APPROXIMATE SCALE

AECOM

LOCKHEED MARTIN CORPORATION
ENGINEERING CONTROL AREA
SHEET 2 OF 3

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG5.dwg	RNB	60544270	2 / 2018	5B

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 5B
Plot File Date Created: Feb/13/2018 1:12 PM
Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG5.DWG


OLD LIVERPOOL ROAD
(C.R. No. 137)
ONONDAGA LAKE PARKWAY
MATCHLINE TO SHEET 2 OF 3
BOX CULVERT
INV.±=362.0
ARCH BOX CULVERT
ASPHALT PARKING LOT
PARKING
BRUSH
PATIO
SHED
CONCRETE CURB
N 1,129,500
N 1,129,000
N 1,128,500
E 923,000
E 922,500
E 922,000
LEGEND
BLOODY BROOK DRAINAGE DISTRICT EASEMENT
PROPERTY BORDER
TOPOGRAPHIC CONTOUR LINE
CENTERLINE OF CHANNEL
STREAM/WATER EDGE
UNDERGROUND DRAIN LINE
OVERHEAD WIRES
RETAINING WALL
GUARD RAIL
UTILITY MANHOLE
DRAINAGE MANHOLE
SANITARY MANHOLE
RAILROAD TRACKS
CATCH BASIN
DRAINAGE STRUTURES
FLAG POLE
CULVERT
E 924,000 NYS PLANE COORDINATE SYSTEM EASTING
N 1,131,000 NYS PLANE COORDINATE SYSTEM NORTHING
BL-115 AERIAL SURVEY GROUND CONTROL POINT
7+50 CHANNEL CENTERLINE SURVEY STATION
367.4 TOPOGRAPHIC SPOT ELEVATION
CONIFEROUS TREE
DECIDUOUS TREE
LIGHT POLE
UTILITY POLE / GUY WIRE
LOCATION HISTORIC BROOK ALIGNMENT
ENGINEERING CONTROL AREA
0' 50' 100'
APPROXIMATE SCALE

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

AECOM

LOCKHEED MARTIN CORPORATION

ENGINEERING CONTROL AREA
SHEET 3 OF 3

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SMP_FIG5.dwg	RNB	60544270	2 / 2018	5C

Plotted By: Bookasr
Layout-Sheet Name: FIGURE 5C
Plot File Date Created: Feb/13/2018 9:58 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\SMP – 2018\SMP_FIG5.DWG

APPENDIX A

Site Contact List

AFFILIATION	NAME/TITLE	TELEPHONE	EMAIL
New York State Department of Environmental Conservation	Jacky Luo Project Manager	518-402-9676	jacky.luo@dec.ny.gov
New York State Department of Health	Mark Sergott, P.G. Project Manager	518-402-7860	beei@health.ny.gov
Lockheed Martin Corporation	Jill Fonte Environmental Engineer	315-456-1993 desk 315-944-8082 cell 315-456-3723 (ESH Admin)	jill.a.fonte@lmco.com

APPENDIX B

2017 Record Drawings

XREFS: NONE

PROJECT NUMBER: 03.1070

CAD DWG. FILE NAME: Bloody Brook Record Survey 12-08-17.dwg

LEGEND

- FP — FLAG POLE
- LP — LIGHT POLE
- UTILITY POLE / GUY WIRE
- SMH — SANITARY MANHOLE
- UMH — UTILITY MANHOLE
- DS — DRAINAGE STRUCTURES
- DMH — DRAINAGE MANHOLE
- SMH — SANITARY MANHOLE
- FENCES
- GP — GATE POST
- BOL — BOLLARD
- MAP REFERENCE 1 PROPERTY LINE
- GUIDE RAIL
- OHW — OVERHEAD WIRES
- EDGE OF RIP-RAP
- SS — SANITARY SEWER
- ST — STORM DRAIN
- EDGE OF WATER

MAP NOTES

1.) NORTH ORIENTATION IS BASED CENTRAL ZONE OF THE NEW YORK STATE PLANE COORDINATE SYSTEM NAD 83

2.) VERTICAL DATUM IS BASED ON NAVD 1988.

3.) GRAYSCALE DATA SHOWN HEREON IS THE RESULT OF CONTROLLED, STEREO AERIAL PHOTOGRAPHY OBTAINED BY THE FIRM OF LAFAVE, WHITE & McGIVERN ON NOVEMBER 12, 2005 IN CONJUNCTION WITH CONTROL PROVIDED BY THE UNDERSIGNED, AND PREVIOUS INFORMATION AS SHOWN ON MAP REFERENCE No.1.

4.) UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM DATA OBTAINED BY FIELD SURVEY, PREVIOUS MAPS AND RECORDS, (AND PAROL TESTIMONY). THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHER UNDERGROUND UTILITIES, THE EXISTENCE OF WHICH ARE NOT KNOWN TO THE UNDERSIGNED. SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES MUST BE VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO ANY CONSTRUCTION.

5.) RECORD DATA FIELD WORK PERFORMED DURING THE MONTHS OF JUNE AND JULY 2017.

MAP REFERENCE

1.) MAP ENTITLED "WEST BRANCH OF BLOODY BROOK" PREPARED BY IANUZI & ROMANS, P.C. DATED JANUARY 28, 2003 FILE NUMBER 2974.001

BAR SCALE

60 0 30 60 120

1 inch = 60 ft.

"ONLY COPIES OF THIS MAP SIGNED IN RED INK AND EMBOSSED WITH THE SEAL OF AN OFFICER OF C.T. MALE ASSOCIATES OR A DESIGNATED REPRESENTATIVE SHALL BE CONSIDERED TO BE A VALID 'TRUE COPY'".

DAVID J. UHRINEC, PLS
P.L.S. NO. 050052

STATE OF NEW YORK — DAVID JOSEPH UHRINEC — 050052 — LICENSED LAND SURVEYOR

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
08/28/17	1	added topo soil in private areas	dju	dju	dju
08/30/17	2	removed addresses	dju	dju	dju
12/08/17	3	weirs 2 & 3, OLP Road Rip Rap	dju	dju	dju
	4				
	5				
	6				
	7				
	8				
	9				

APPROVED: dju
DRAFTED : dju
CHECKED : dju
PROJ. NO : 03.1070
SCALE : 1"=60'
DATE : 07/13/14

2017 RECORD SURVEY

LOCKHEED MARTIN COPORATION

WEST BRANCH BLOODY BROOK

TOWN OF SALINA — ONONDAGA COUNTY, NEW YORK

C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.
200 GATEWAY PARK DRIVE, BLDG. C, P.O. BOX 3246
SYRACUSE, NY 13220-3246
315.458.6498 * FAX 315.458.4427

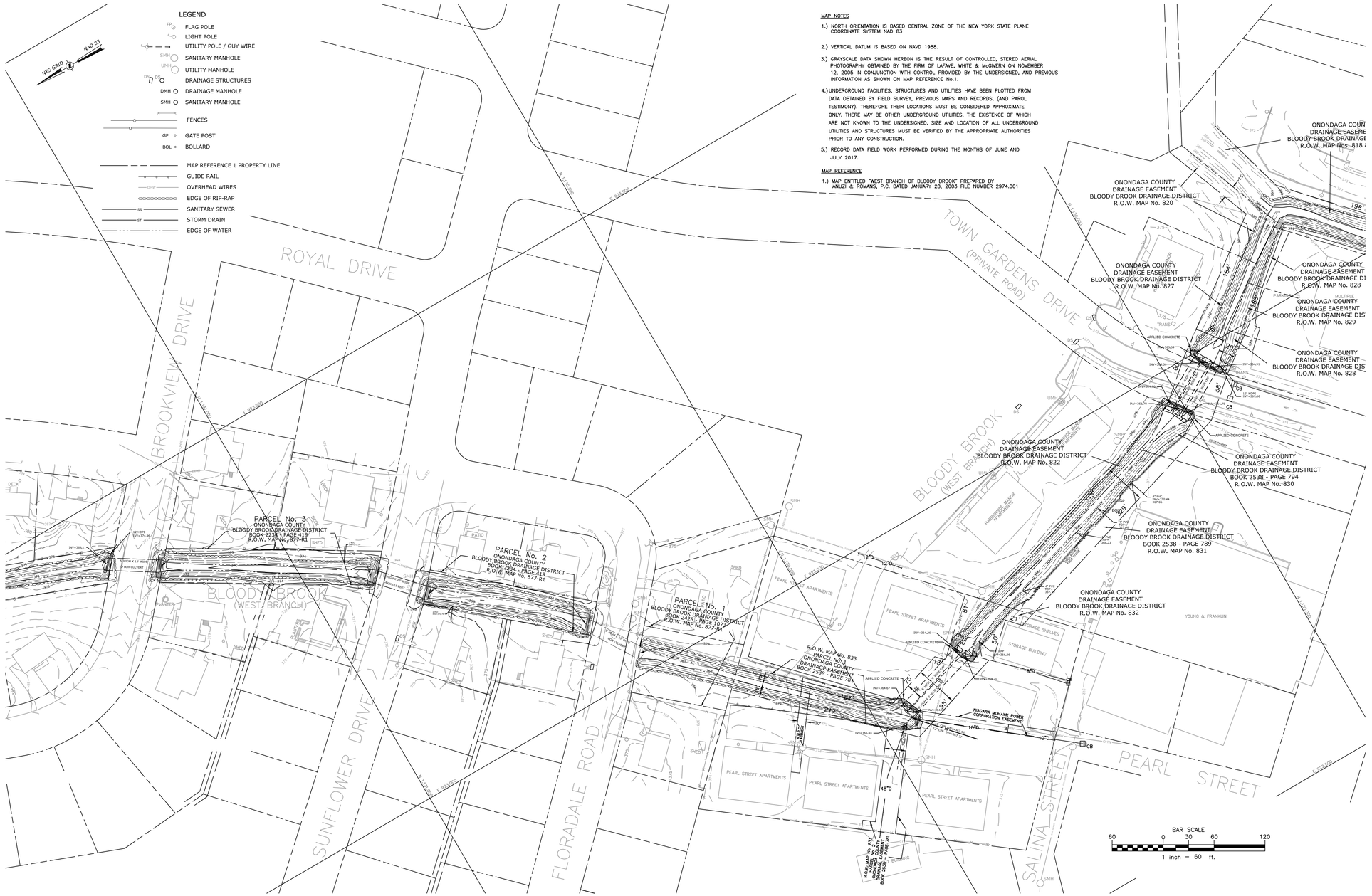
SHEET 1 OF 3

DWG. NO: 17-0419

XREFS: NONE

PROJECT NUMBER: 03.1070

CAD DWG. FILE NAME: Bloody Brook Record Survey 12-08-17



"ONLY COPIES OF THIS MAP SIGNED IN RED INK AND EMBOSSED WITH THE SEAL OF AN OFFICER OF C.T. MALE ASSOCIATES OR A DESIGNATED REPRESENTATIVE SHALL BE CONSIDERED TO BE A VALID TRUE COPY".

DAVID J. UHRINEC, PLS
P.L.S. NO. 050052

STATE OF NEW YORK DAVID JOSEPH UHRINEC 050052 LICENSED LAND SURVEYOR

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
08/28/17	1	added topo soil in private areas	dju	dju	dju
08/30/17	2	removed addresses	dju	dju	dju
12/08/17	3	weirs 2 & 3, OLP Road Rip Rap	dju	dju	dju'
	4				
	5				
	6				
	7				
	8				
	9				

APPROVED: dju
DRAFTED : dju
CHECKED : dju
PROJ. NO : 03.1070
SCALE : 1"=60'
DATE : 07/13/14

2017 RECORD SURVEY
LOCKHEED MARTIN COPORATION
WEST BRANCH BLOODY BROOK

TOWN OF SALINA — ONONDAGA COUNTY, NEW YORK

C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.
200 GATEWAY PARK DRIVE, BLDG. C, P.O. BOX 3246
SYRACUSE, NY 13220-3246
315.458.6498 * FAX 315.458.4427

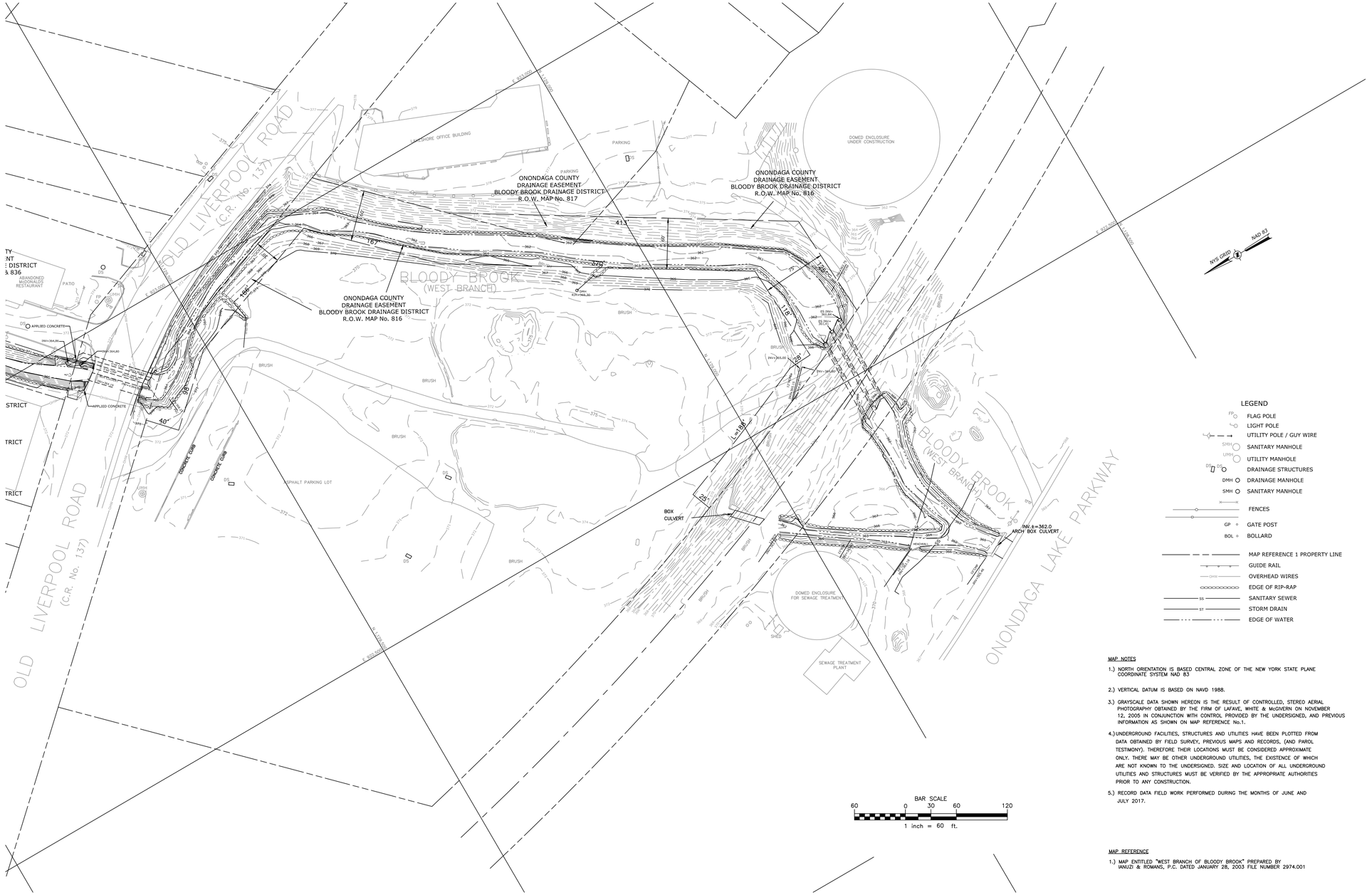
SHEET 2 OF 3
DWG. NO: 17-0419

CAD DWG. FILE NAME: \\Sv-fp\data\Projects\031070\Survey\2017 Record Survey\Bloody Brook Record Survey 12-08-17.dwg

XREFS: NONE

PROJECT NUMBER: 03.1070

CAD DWG. FILE NAME: Bloody Brook Record Survey 12-08-17



LEGEND

- FP — FLAG POLE
- LP — LIGHT POLE
- UTILITY POLE / GUY WIRE
- SMH — SANITARY MANHOLE
- UMH — UTILITY MANHOLE
- DS — DRAINAGE STRUCTURES
- DMH — DRAINAGE MANHOLE
- SMH — SANITARY MANHOLE
- FENCES
- GP — GATE POST
- BOL — BOLLARD
- MAP REFERENCE 1 PROPERTY LINE
- GUIDE RAIL
- OHW — OVERHEAD WIRES
- EDGE OF RIP-RAP
- SS — SANITARY SEWER
- ST — STORM DRAIN
- EDGE OF WATER

MAP NOTES

1.) NORTH ORIENTATION IS BASED CENTRAL ZONE OF THE NEW YORK STATE PLANE COORDINATE SYSTEM NAD 83

2.) VERTICAL DATUM IS BASED ON NAVD 1988.

3.) GRAYSCALE DATA SHOWN HEREON IS THE RESULT OF CONTROLLED, STEREO AERIAL PHOTOGRAPHY OBTAINED BY THE FIRM OF LAFAVE, WHITE & McGIVERN ON NOVEMBER 12, 2005 IN CONJUNCTION WITH CONTROL PROVIDED BY THE UNDERSIGNED, AND PREVIOUS INFORMATION AS SHOWN ON MAP REFERENCE No.1.

4.) UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM DATA OBTAINED BY FIELD SURVEY, PREVIOUS MAPS AND RECORDS, (AND PAROL TESTIMONY). THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHER UNDERGROUND UTILITIES, THE EXISTENCE OF WHICH ARE NOT KNOWN TO THE UNDERSIGNED. SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES MUST BE VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO ANY CONSTRUCTION.

5.) RECORD DATA FIELD WORK PERFORMED DURING THE MONTHS OF JUNE AND JULY 2017.

BAR SCALE

60 0 30 60 120

1 inch = 60 ft.

MAP REFERENCE

1.) MAP ENTITLED "WEST BRANCH OF BLOODY BROOK" PREPARED BY IANUZI & ROMANS, P.C. DATED JANUARY 28, 2003 FILE NUMBER 2974.001

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P.L.S. NO. 050052

STATE OF NEW YORK · DAVID JOSEPH UHRINEC · 050052 · LICENSED LAND SURVEYOR

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
08/28/17	1	added topo soil in private areas	dju	dju	dju
08/30/17	2	removed addresses	dju	dju	dju
12/08/17	3	weirs 2 & 3, OLP Road Rip Rap	dju	dju	dju
	4				
	5				
	6				
	7				
	8				
	9				

APPROVED: dju
DRAFTED : dju
CHECKED : dju
PROJ. NO : 03.1070
SCALE : 1"=60'
DATE : 07/13/14

2017 RECORD SURVEY

LOCKHEED MARTIN COPORATION

WEST BRANCH BLOODY BROOK

TOWN OF SALINA — ONONDAGA COUNTY, NEW YORK

C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.
200 GATEWAY PARK DRIVE, BLDG. C, P.O. BOX 3246
SYRACUSE, NY 13220-3246
315.458.6498 * FAX 315.458.4427

SHEET 3 OF 3

DWG. NO: 17-0419

APPENDIX C

Historical Aerial Photos

NOT TO SCALE

REFERENCES:

1. PHOTO SOURCE: DATED 9-6-38, ID ARX-31-53.

AECOM

LOCKHEED MARTIN CORPORATION

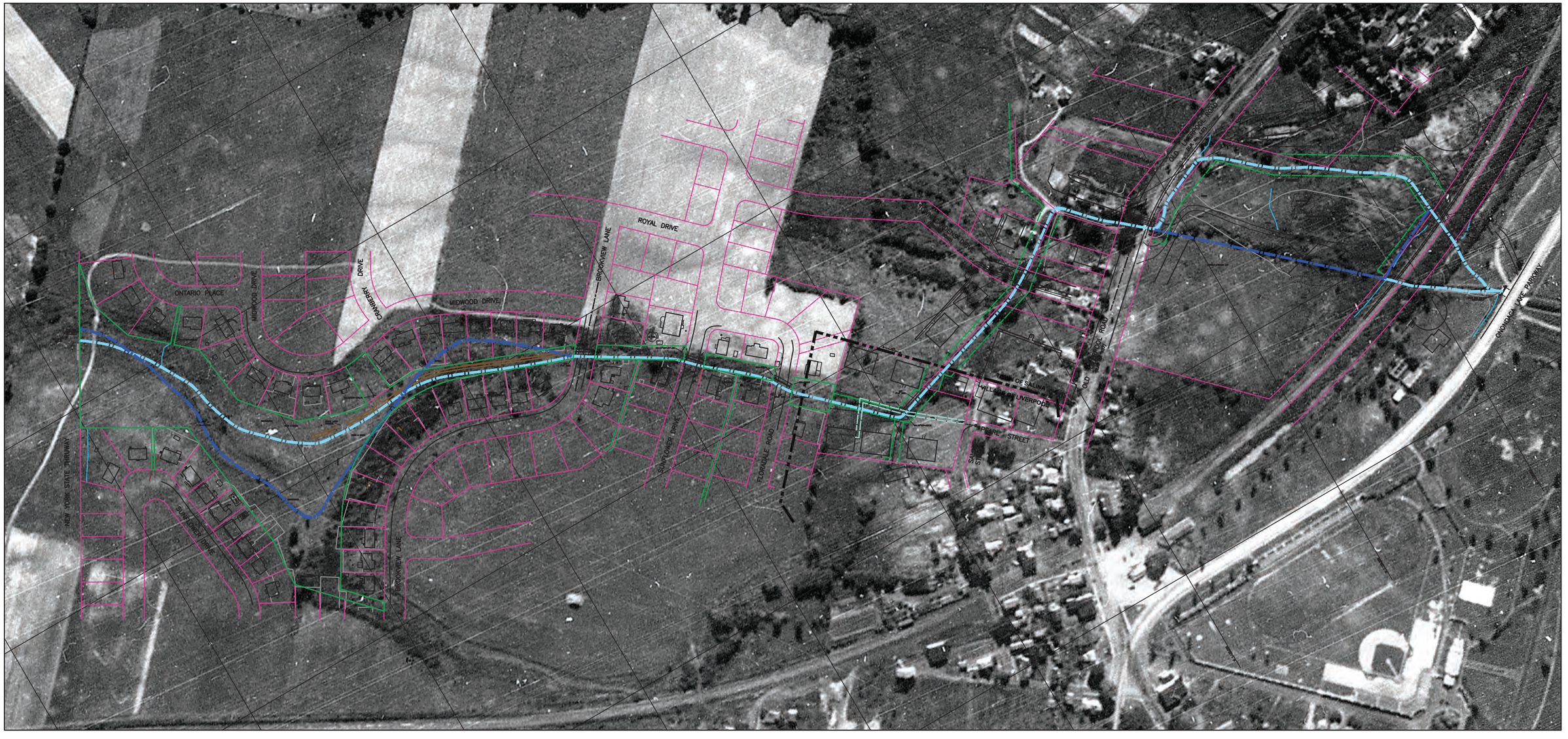
1938 AERIAL PHOTOGRAPH

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
D11APPXAFIG1A_B.dwg	---	60194430	12 / 2012	1A

Plotted By: bookasr
Layout: Sheet Name: FIGURE 1A
Plot File Date Created: Dec/17/2012 8:21 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\D11APPXAFIG1A_B.DWG



NOT TO SCALE

LEGEND

- BLOODY BROOK DRAINAGE DISTRICT EASEMENT
- CURRENT PROPERTY BORDER
- CURRENT BROOK ALIGNMENT
- HISTORIC BROOK ALIGNMENT

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C
2. PHOTO SOURCE: DATED 9-6-38, ID ARX-31-53.

AECOM

LOCKHEED MARTIN CORPORATION

1938 AERIAL PHOTOGRAPH
WITH SITE BASE MAP

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
D11APPXAFIG1A_B.dwg	---	60194430	12 / 2012	1B

Plotted By: bookasr
Layout: Sheet Name: FIGURE 1B
Plot File Date Created: Dec/17/2012 8:24 AM

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NOT TO SCALE

REFERENCES:

1. PHOTO SOURCE: DATED 5-7-56, ID GS-VKX.

AECOM

LOCKHEED MARTIN CORPORATION

1956 AERIAL PHOTOGRAPH

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
D12APPXAFIG2A_B.dwg	---	60194430	12 / 2012	2A

Plotted By: bookasr
Layout-Sheet Name: FIGURE 2A
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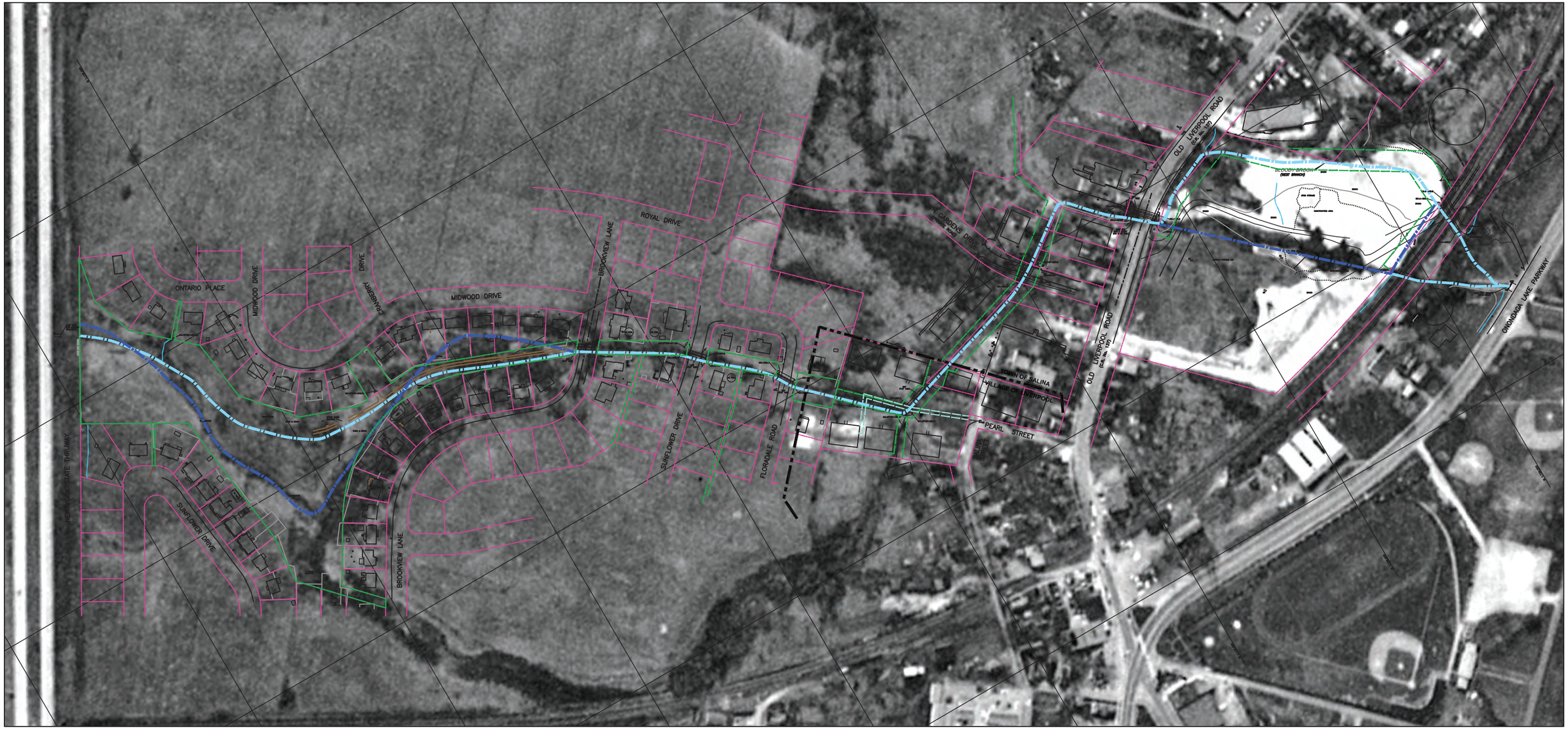

NOT TO SCALE

LEGEND

- BLOODY BROOK DRAINAGE DISTRICT EASEMENT
- CURRENT PROPERTY BORDER
- CURRENT BROOK ALIGNMENT
- HISTORIC BROOK ALIGNMENT

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C
2. PHOTO SOURCE: DATED 5-7-56, ID GS-VKX.

AECOM

LOCKHEED MARTIN CORPORATION

1956 AERIAL PHOTOGRAPH
WITH SITE BASE MAP

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
D12APPXAFIG2A_B.dwg	---	60194430	12 / 2012	2B

Plotted By: bookser
Layout-Sheet Name: FIGURE 2B
Plot File Date Created: Dec/17/2012 8:28 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\D12APPXAFIG2A_B.DWG

NOT TO SCALE

REFERENCES:

1. PHOTO SOURCE: DATED 4-26-64, ID 1426 14 82.

AECOM

LOCKHEED MARTIN CORPORATION

1964 AERIAL PHOTOGRAPH

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
D13APPXAFIG3A_B.dwg	---	60194430	12 / 2012	3A

Plotted By: bookasr
Layout: Sheet Name: FIGURE_3A
Plot File Date Created: Dec/17/2012 8:32 AM

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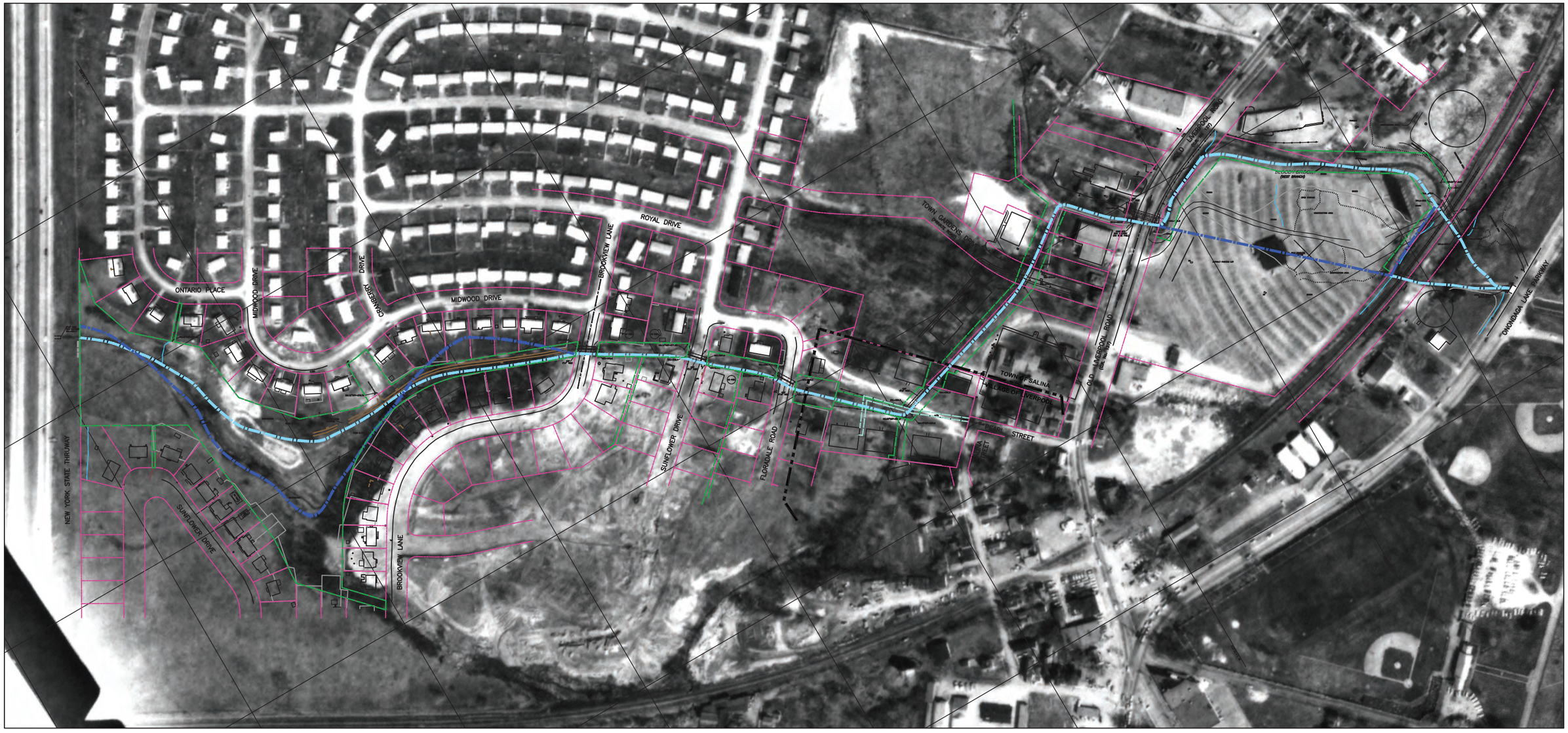


NOT TO SCALE

LEGEND

- BLOODY BROOK DRAINAGE DISTRICT EASEMENT
- CURRENT PROPERTY BORDER
- CURRENT BROOK ALIGNMENT
- HISTORIC BROOK ALIGNMENT

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C
2. PHOTO SOURCE: DATED 4-26-64, ID 1426 14 82.

AECOM

LOCKHEED MARTIN CORPORATION

1964 AERIAL PHOTOGRAPH
WITH SITE BASE MAP

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
D13APPXAFIG3A_B.dwg	---	60194430	12 / 2012	3B

Plotted By: bookasr
Layout: Sheet Name: FIGURE 3B
Plot File Date Created: Dec/17/2012 8:34 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\D13APPXAFIG3A_B.DWG

NOT TO SCALE

REFERENCES:

1. PHOTO SOURCE: LaFAVE, WHITE & McGIVERN, L.S., P.C.; DATED 11–12–05, 1–1 THROUGH 1–6.

AECOM

LOCKHEED MARTIN CORPORATION

2005 AERIAL PHOTOGRAPH

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
D14APPXAFIG4A_B.dwg	---	60194430	12 / 2012	4A

Plotted By: bookasr
Layout-Sheet Name: FIGURE 4A
Plot File Date Created: Dec/17/2012 8:36 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\D14APPXAFIG4A_B.DWG

NOT TO SCALE

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C
2. PHOTO SOURCE: LaFAVE, WHITE & McGIVERN, L.S., P.C.; DATED 11-12-05, 1-1 THROUGH 1-6.

LEGEND

- BLOODY BROOK DRAINAGE DISTRICT EASEMENT
- CURRENT PROPERTY BORDER
- CURRENT BROOK ALIGNMENT
- HISTORIC BROOK ALIGNMENT

AECOM

LOCKHEED MARTIN CORPORATION

2005 AERIAL PHOTOGRAPH
WITH SITE BASE MAP

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
D14APPXAFIG4A_B.dwg	---	60194430	12 / 2012	4B

Plotted By: bookasr
Layout-Sheet Name: FIGURE 4B
Plot File Date Created: Dec/17/2012 8:38 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN - BLOODY BROOK\CAD\D14APPXAFIG4A_B.DWG

APPENDIX D

Excavation Work Plan

BLOODY BROOK

ONONDAGA COUNTY

LIVERPOOL, NEW YORK

Excavation Work Plan

Prepared for:

Lockheed Martin Corporation
497 Electronics Parkway
Building EP-6, Room 100B
Liverpool, New York 13088

Prepared by:

AECOM
5015 Campuswood Drive, Suite 104
E. Syracuse, NY 13057

TABLE OF CONTENTS

1 INTRODUCTION

This Excavation Work Plan (EWP) has been prepared to summarize general requirements related to handling contaminated soil when completing ground-intrusive activities on the Bloody Brook site (the "site") in areas determined to have the potential for residual cadmium. This EWP is presented as Appendix B to the Site Management Plan (SMP) and has been developed in accordance with the New York State Department of Environmental Conservation (NYSDEC) May 2010 guidance, *DER-10 Technical Guidance for Site Investigation and Remediation* (DER-10) and the NYSDEC *Site Management Plan Template*.

Because the site encompasses privately-owned single-family and multi-family residential and commercial properties, public-owned Town of Salina and Onondaga County properties, and the Onondaga County Drainage District Easement, institutional controls (ICs) will be implemented to address the potential for ground-intrusive activities in the different areas. The provisions included in these ICs are discussed in Section 3 of the SMP (Institutional and Engineering Control Plan). This EWP addresses only the handling of the soils during excavation activities once determined necessary in accordance to the applicable IC.

2 NOTIFICATION

Within 14 days following Lockheed Martin being notified of any activity that is anticipated to encounter remaining contamination, Lockheed Martin or their representative will notify the NYSDEC. Table 1 of the SMP includes contact information for this notification. This information will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

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 G 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.

3 SOIL SCREENING METHODS

Soil screening methods will not be used at this site. Remedial investigations at the Bloody Brook site have identified cadmium (a heavy metal) as a contaminant of concern, and excavation limits with concentrations of concern will be identified using existing and pre-construction sample data. Existing and pre-construction sample data will be reviewed and excavation limits determined for all excavations into known or potentially contaminated material (remaining contamination). Review of soil samples will be performed when invasive work is going to be completed and will include all excavation and invasive work performed.

Soils will be segregated based on previous environmental data into material that requires off-site disposal, material that is confirmed clean cover soil, 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 Sections 6 through 8 of this appendix.

4 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.

5 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 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 decontamination and/or wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be cleaned of potentially contaminated site soil. If needed, 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.

6 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 provided in Figure 1 of this appendix. Routes direct all traffic from the site to the New York State Thruway (Exit 37). All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes, which will take 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.

7 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).

8 MATERIALS REUSE ON-SITE

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

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.

9 FLUIDS MANAGEMENT

All liquids to be removed from the site, including but not limited to excavation dewatering and decontamination waters, will be handled, transported and disposed of in accordance with applicable local, State, and Federal regulations. Dewatering and decontamination 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.

10 COVER SYSTEM RESTORATION

After completion of soil removal and any other invasive activities, the cover system will be restored in a manner that complies with the 2014 Decision Document and the applicable Construction and Restoration Work Plans. The existing cover system is comprised of a minimum of 24 inches of clean soil or stone. The demarcation layer, consisting of white geotextile or equivalent material, will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

11 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 6 NYCRR 375-6.8. 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.

12 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.

13 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.

14 COMMUNITY AIR MONITORING PLAN

This Community Air Monitoring Plan (CAMP) has been prepared to summarize the air monitoring procedures that will be implemented during ground intrusive activities into contaminated and/or potentially contaminated soil at the Bloody Brook site. This CAMP has been developed consistent with NYSDEC's May 2010 guidance entitled DER-10 Technical Guidance for Site Investigation

and Remediation (DER-10) and the New York State Department of Health Generic Community Air Monitoring Plan (NYSDOH Generic CAMP) included as Attachment 1A of DER-10. The remedial investigation at the Bloody Brook site has identified cadmium (a heavy metal) as a contaminant of concern. Because a heavy metal was identified as the contaminant of concern, DER-10 requires that the CAMP include real-time monitoring for particulates (i.e., dust) at the downwind perimeter of a work area during ground intrusive activities. The intent of this CAMP is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses) from potential airborne contaminant releases as a direct result of the ground intrusive activities. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Instrument readings obtained as part of the CAMP will be recorded and available for NYSDEC and New York State Department of Health (NYSDOH) personnel to review.

Real-time air monitoring for particulates (i.e., dust) will be conducted continuously for all ground intrusive activities into contaminated and/or potentially contaminated soil (e.g., soil excavation, backfilling, etc.). The remedial investigation at the Bloody Brook site did not identify volatile organic compounds (VOCs) as a contaminant of concern. Therefore, community air monitoring for VOCs is not included.

CAMP monitoring locations will initially be located at the boundary of the work area. The CAMP monitoring will be performed using real-time aerosol monitors such as a Thermo MIE pDR-4000 DataRam (data-RAM) or equivalent equipment capable of monitoring airborne dust consisting of particulate matter measuring less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level listed below.

The specific location of each of the CAMP monitors will be determined daily as weather conditions change. The CAMP monitor locations will be based on factors such as wind direction and the proximity of potential receptors to the excavation activities. A CAMP monitor will be placed at a location upwind and downwind of the excavation activities. In addition, a CAMP monitor will be placed near the closest off-site receptor.

The following action levels for particulates are in accordance with the NYSDOH Generic CAMP:

Action Level	**Response**
>0.1 mg/m^3 Above the background for the 15 minute average or if airborne dust is observed leaving the work area	Employ dust suppression techniques
0.1 to 0.15 mg/m^3	Work may continue with dust suppressions techniques provided downwind PM-10 particulate levels do not exceed 0.15 mg/m^3 above background for the 15-minute average and airborne dust is not observed leaving the work area
>0.15 mg/m^3	Cease operations. Contact PM, Director of Health, and Safety or designee immediately.

Air monitoring readings will be measured and recorded both electronically via the instrument data logger and manually using an excel file, as appropriate. The readings will be exported from the monitoring equipment and placed in the project records. Additionally, instantaneous readings used for decision purposes, if any, will be recorded on the daily notes and/or logs and placed in the project records. The air monitoring data and manual recordings will be made available to the NYSDEC and NYSDOH personnel upon request.

15 ODOR CONTROL PLAN

The odor control plan is capable of controlling emissions of nuisance odors on- and off-site. Remedial investigations at the Bloody Brook site have identified cadmium (a heavy metal) as a contaminant of concern. Because a heavy metal is the contaminate of concern and past ground intrusive activities have not resulted in nuisance odor, no site specific odor control methods have been identified 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.

16 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 wetting of areas using an on-site water source (e.g., fire hydrant or water from West Branch of Bloody Brook or Bloody Brook).
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

17 OTHER NUISANCES

Work activity scheduling will comply with local noise ordinances, which specify permitted noises as including construction work, between the hours of 7:00 am and 9:00 pm. Unavoidable work outside of these permitted hours shall not emit noise levels above 88 decibels when measured 50 feet from the work. No unnecessary construction shall be permitted on weekends unless local proper police, fire, and safety groups are notified.

APPENDIX E

Agreement with Onondaga County

COUNTY OF ONONDAGA

DEPARTMENT OF LAW
John H. Mulroy Civic Center, 10th Floor
421 Montgomery Street
Syracuse, New York 13202
(315) 435-2170 • Fax (315) 435-2043
www.ongov.net

JOANNE M. MAHONEY
COUNTY EXECUTIVE

GORDON J. CUFFY
COUNTY ATTORNEY

July 9, 2014

Jill Fonte, Environmental Engineer
Lockheed Martin Mission Systems & Training
497 Electronics Parkway
Liverpool, New York 13088

Dear Ms. Fonte:

Enclosed for your records is one (1) fully executed copy of the contract you entered with the County of Onondaga.

This letter will serve as your notice to proceed with the service as set forth in said contracts.

Very truly yours,

Mary Beth Paul
Confidential Assistant

Enclosure

AGREEMENT RELATING TO BLOODY BROOK VOLUNTARY CLEANUP SITE

THIS AGREEMENT (the "Agreement"), made as of July 9, 2014, by and between the COUNTY OF ONONDAGA, 421 Montgomery Street, Syracuse, New York 13202, by Joanne M. Mahoney, its County Executive ("the County") and LOCKHEED MARTIN CORPORATION, P.O. Box 4840, Syracuse, New York 13221-4840 ("Lockheed Martin"), each a "party" and, collectively, the "parties" to this Agreement.

WHEREAS, Lockheed Martin entered into a Voluntary Cleanup Agreement, dated July 19, 2002 (Index # D7-0001-01-09) (the "VCA"), with the New York State Department of Environmental Conservation ("NYSDEC"), pursuant to which Lockheed Martin agreed to develop and implement a remedial program in a portion of Bloody Brook, as depicted on a map attached to this Agreement as Exhibit A, which portion of Bloody Brook for purposes of this Agreement shall be referred to as the "Site;"

WHEREAS, the VCA governs the submission and implementation by Lockheed Martin of work plans for the Site investigation, remediation and operation, maintenance and monitoring;

WHEREAS, the County holds a drainage district easement located within the boundaries of the Site for purposes of construction, operation and maintenance of drainage and flood control facilities, the boundaries of which easement are depicted on a map attached to this Agreement as Exhibit B;

WHEREAS, the County granted Lockheed Martin access to the drainage district easement by an Access Agreement for Temporary Use And Occupancy Of Property, dated April 1, 2008;

WHEREAS, pursuant to the VCA, NYSDEC has issued a Final Decision Document selecting the remedy proposed in Lockheed Martin's Remedial Action Work Plan dated February 2013 (the "RAWP") that was prepared to address, among other things, the presence of cadmium in brook sediment and soil located in the drainage district easement that was identified by Lockheed Martin during its remedial investigation of the Site;

WHEREAS, studies performed by Lockheed Martin indicate that after Lockheed Martin implements the remedy described in the RAWP, some cadmium will remain in certain soil within the drainage district easement at various depths; and

WHEREAS, the County has determined that to protect its legal interests, it desires to enter into this Agreement with Lockheed Martin to assure that the presence in the future of cadmium in soil within the drainage district easement will not adversely affect County uses of the drainage district easement or result in additional cost to the County for drainage district operation, maintenance or construction after Lockheed Martin constructs the remedy described in the RAWP.

NOW, THEREFORE, in consideration of the foregoing, the mutual agreements herein contained and other good and valuable consideration, it is hereby mutually agreed as follows:

1. Use of Drainage District Easement

Lockheed Martin acknowledges that certain activities it will perform to implement the remedy described in the RAWP will occur within the County's drainage district easement. For purposes of this Agreement, any activities performed by Lockheed Martin within the drainage district easement in accordance with the RAWP, as the RAWP may be amended from time to time with NYSDEC's approval, or otherwise, which activities shall include but not be limited to sampling, construction, restoration, and operation, monitoring and/or maintenance of the remedy, shall be referred to, collectively, as the "Lockheed Martin Work." Lockheed Martin will design and implement the Lockheed Martin Work within the drainage district easement in a manner that does not unreasonably interfere with or preclude the County's intended uses of the drainage district easement or its operation, maintenance, construction, reconstruction and use of drainage and flood control facilities constructed and/or maintained by the County in the easement area now or in the future. Lockheed Martin shall be responsible for all costs and expenses of all types required to perform the Lockheed Martin Work.

2. Residual Cadmium in Soil

The Lockheed Martin Work will involve the removal of all Bloody Brook sediments and the removal of soil containing cadmium at certain prescribed depths from within the drainage district easement to achieve certain soil cleanup levels approved by NYSDEC (the "SCLs"). However, the RAWP provides that cadmium will remain in soil in certain locations within the drainage district easement at depths to be identified by Lockheed Martin post-remediation. The cadmium that remains in soil post-remediation in the drainage district easement at concentrations that exceed the SCLs is hereinafter referred to as "Residual Cadmium." The County anticipates that the presence of Residual Cadmium may increase the County's cost for work to construct, reconstruct, repair, replace, operate and maintain drainage and flood control facilities in the drainage district easement in accordance with applicable federal, state and local laws and regulations (collectively, the "County Work").

In accordance with the provisions of this Agreement, Lockheed Martin will pay the County a sum representing the increased cost, if any, to perform the County Work in areas where Residual Cadmium is present as compared to the cost the County would have incurred for County Work if there were no Residual Cadmium. For purposes of this Agreement, the sum representing the increased cost to the County will be the "Increment." To clarify what is meant by an Increment, if the cost of excavation, transportation and disposal of soil containing Residual Cadmium in accordance with applicable laws and regulations is $10,000, and the cost of this same work for soil that does not contain Residual Cadmium is $8,000, the Increment is $2,000. Lockheed Martin shall have no obligation to pay the County under this Agreement any Increment

that arises from the presence of contamination in the drainage district easement caused by pollutants other than cadmium in concentrations that exceed the SCLs.

For purposes of this Agreement, the term "County Work" does not include "Culvert Work," as this term is defined in paragraph 5 below. The terms and conditions of this Agreement that address Culvert Work are set forth in paragraph 5 of this Agreement, unless Lockheed Martin exercises its right not to proceed with the Culvert Work as described in paragraph 5(k). If Lockheed Martin exercises this right, the terms of this paragraph and paragraph 3 with regard to incremental costs will apply to any culvert work undertaken by the County.

3. Increment Request

Increment requests will be submitted by the County to Lockheed Martin in writing and shall be accompanied by (a) a detailed and dated estimate of the cost of the County Work performed in areas of the drainage district easement where Residual Cadmium is present, which estimate will show discrete work tasks and supporting vendor and contractor quotes, (b) a detailed and dated estimate for the cost of the same County Work, but assuming Residual Cadmium is not present in the drainage district easement, which estimate will show discrete work tasks and supporting vendor and contractor quotes, and (c) evidence of payment by the County for the County Work, disposal manifests, weigh tickets, and analytical sampling results, if required. Each estimate shall be dated no earlier than three (3) months before the date the County commenced the work for which it is seeking an Increment. The County shall submit any Increment request to Lockheed Martin within forty-five (45) days of completing and paying for County Work for which an Increment is sought. If Lockheed Martin disputes all or any portion of an Increment request, it shall provide written notification to the County of such dispute and the reasons therefore within thirty (30) days of receipt of the Increment request. Lockheed Martin will pay the undisputed amount of any Increment to the County within sixty (60) days of receipt of the documentation required to be submitted pursuant to this Agreement.

4. Notice of Work

Within thirty (30) days of placing a line item in its budget for County Work that may encounter Residual Cadmium, the County will provide written notice to Lockheed Martin of the date it anticipates commencing the budgeted County Work (the "initial notice") and a detailed description of the County Work, which will include identification of the areas at the Site that will be disturbed by the County Work and the anticipated depths of that disturbance. Within thirty (30) days of receipt of the initial notice from the County, Lockheed Martin will advise the County whether, based on soil sampling data and any other relevant information in Lockheed Martin's records, the County Work is expected to disturb Residual Cadmium.

After Lockheed Martin completes the remediation work at the Site required pursuant to the VCA, it will maintain a site drawing that shows the estimated locations and depths of Residual Cadmium in the drainage district easement based on then

available data. Lockheed Martin will update the site drawing periodically when additional information, if any, regarding the location of Residual Cadmium in the drainage district easement becomes available. Lockheed Martin will provide a copy of the initial site drawing and any updates to the County for its information regarding Residual Cadmium.

If the proposed County Work has the potential to disturb Residual Cadmium, at the County's request, Lockheed Martin will consult with the County regarding the management of the Residual Cadmium. At least ninety (90) days prior to the actual start date for such County Work, the County shall provide Lockheed Martin with a written budget, including copies of the detailed and dated estimates referenced in subsections (a) and (b) of paragraph 3 above. Within thirty (30) days of receipt of the written budget, Lockheed Martin shall submit to the County any comments and/or objections concerning the cost of the County Work, which the parties shall thereafter discuss and attempt to resolve. At least thirty (30) days prior to the actual start date for such County Work, the County shall provide written notice to Lockheed Martin of the start date. The written notice of the actual start date shall describe the County Work and shall attach a copy of proposed plans and a map showing the location of the County Work. This notice provision does not apply to the County's routine mowing activities in the drainage district easement or similar nonintrusive activities.

5. Culvert Work

(a) Culvert Work. The County maintains five culvert crossings at the Site where Lockheed Martin plans to conduct remedial work pursuant to the VCA. The map attached to this Agreement as Exhibit B shows each of these five culvert crossings labeled Culverts 1 through 5 and shows the number of culvert barrels associated with each of the five culverts. The County desires to replace these five culverts because of their age and condition. The County is concerned that cadmium may be present in the soil surrounding the culvert structures and in the soil between the roadways and the culvert structures. Lockheed Martin, at its sole cost and expense, will schedule and undertake work to remove and replace the five culverts and the roadways above the five culverts (the "Culvert Work") and to manage any Residual Cadmium that may be encountered during the Culvert Work.

(b) Project Design. Lockheed Martin will arrange for the preparation of draft and final design documents for the Culvert Work, which shall include detailed construction plans and specifications that will be adequate for Lockheed Martin to retain a contractor for the work (the "Design Documents"). At Lockheed Martin's request, the County will designate an employee(s) knowledgeable in culvert and roadway design and that employee(s) will provide to Lockheed Martin detailed written specifications that will be needed for preparation of the Design Documents and will meet with Lockheed Martin and its design consultant for a pre-design meeting and for follow-up consultation and collaboration on the project design and construction on an as-needed basis.

Lockheed Martin will deliver to the County for comment a copy of draft Design Documents for each of the culverts to be replaced and the County will provide

its comments on the draft Design Documents within forty-five (45) days of receipt. When finalized, Lockheed Martin will deliver to the County a copy of final Design Documents for each culvert to be replaced. Within 30 days of receipt of the final Design Documents, the County shall provide to Lockheed Martin its written, unqualified acceptance of the final Design Documents, or a written explanation as to why it cannot accept the final Design Documents. Lockheed Martin shall respond to any concerns of the County regarding the final Design Documents and shall not commence the Culvert Work until it has received written, unqualified acceptance of the final Design Documents from the County.

(c) Construction. Lockheed Martin shall perform the following work in accordance with the Design Documents (i) remove the roadway above each of the five culverts and remove the five culverts; (ii) construct replacement culverts; (iii) backfill around and above each culvert; and (iv) replace the roadways (collectively, the "Construction Work"). Lockheed Martin shall retain experienced contractors and shall require its contractors to retain only experienced subcontractors to perform the Construction Work. The Construction Work will include but not be limited to stream flow management; material removal, handling, management, transport, storage, treatment, and/or disposal; traffic flow management; and excavation of Residual Cadmium, including staging, hauling, disposal and trench support. Lockheed Martin will be the generator of any material it removes from the Site for off-site disposal, and as such, a Lockheed Martin representative will sign all non-hazardous waste bills of lading or manifests and hazardous waste manifests, as applicable.

(d) Roadway Paving. Lockheed Martin will be responsible for the performance of the work associated with the construction of the road beds and the paving of the roadways above each culvert that it replaces.

(e) Construction Timing. The Construction Work shall be performed in accordance with a schedule to be developed by Lockheed Martin, in its sole discretion and control, and shall be completed in conjunction with the construction of remedial work that Lockheed Martin will be performing at the Site. An anticipated schedule for the Construction Work is attached to this Agreement as Exhibit C. Lockheed Martin reserves the right to modify this schedule at any time and it shall provide periodic updates to the County of the modified schedule.

(f) Project Managers. The County and Lockheed Martin shall each designate a project manager who will facilitate the implementation of this Agreement and serve as the point of contact for each party.

(g) Recordkeeping. Lockheed Martin shall maintain records relating to the Construction Work and the on-site and off-site disposal of any materials removed from the drainage district easement during the Culvert Work for inspection and copying by the County. These records shall include a Health and Safety Plan, bills of lading, waste characterization documentation, waste manifests, disposal documentation and certificates.

(h) Access. The parties each acknowledge that Lockheed Martin and its contractors and their subcontractors shall have access to the drainage district easement for purposes of conducting the Construction Work in accordance with and subject to the provisions of the Access Agreement for Temporary Use And Occupancy Of Property between the parties, dated April 1, 2008 (the "Access Agreement"), a copy of which is attached to this Agreement as Exhibit D. For purposes of clarification, the County hereby confirms that the Culvert Work and the Construction Work are included within the scope of the term "Work," as the term "Work" is defined in the Access Agreement.

(i) Permits and Approvals. Lockheed Martin shall obtain and maintain for the duration of this Agreement and at its own cost all consents, approvals and permits, if any are needed, for the work it performs under this Agreement. Specifically, prior to commencing the Culvert Work, Lockheed Martin will obtain and maintain all approvals required from the Town of Salina and any other governmental agencies (the "municipal authorizations") for the Construction Work and for traffic control during the work. The parties acknowledge that Lockheed Martin will be unable to perform the work if required municipal authorizations are not issued to Lockheed Martin. Lockheed Martin will consult with the Town of Salina regarding any specifications it will require Lockheed Martin to incorporate into the roadway removal and replacement portion of the Construction Work. Lockheed Martin will also be responsible for obtaining access to any privately-owned real property, access to which will be necessary to perform the Culvert Work.

(j) Acceptance of the Work. After the Culvert Work is completed for each of the five culverts and for each of the roadways proposed to be removed and replaced, a County engineer will inspect the Culvert Work and indicate in writing whether it is accepted. Lockheed Martin will provide an as-built report to the County demonstrating that the Culvert Work for a specific culvert and roadway was performed in accordance with the Design Documents and Lockheed Martin will request the County to sign the as-built report, thereby acknowledging its acceptance of the work. After the Culvert Work, on a culvert-by-culvert basis, is accepted by the County as indicated by its signature on the applicable inspection and as-built report, Lockheed Martin shall have no further obligation to the County relative to the replacement culvert and roadway, including but not limited to any obligation for the operation, maintenance, repair, or replacement of the culvert and roadway. The Bloody Brook Drainage District will be the owner of the replacement culverts, and not Lockheed Martin.

(k) Right to Cease Culvert Work. Lockheed Martin reserves the right to determine, in its sole discretion, that it will not remove and replace one or more of the five culverts and roadways at the Site that are addressed in this Agreement, provided that such decision is made prior to Lockheed Martin's commencing any work that would disturb the culvert(s) and roadway(s) above the culvert for which removal and replacement is planned. If Lockheed Martin determines to abandon the culvert removal and replacement work at any time, it will provide prompt notice to the County of that decision, after which time, Lockheed Martin shall have no further obligation under this Agreement to perform Culvert Work. Lockheed Martin's exercise of its right not to proceed with the Culvert Work relative to one or more of the five culverts shall not alter

or affect in any way Lockheed Martin's obligations pursuant to paragraph 2 of this Agreement relative to any Residual Cadmium in and around the culverts at the Site. Management of Residual Cadmium which the County is required to undertake in connection with any work that the County performs in and around any culverts that Lockheed Martin elects not to replace pursuant to this paragraph shall be subject to the incremental cost provisions of paragraph 2.

6. Dispute Resolution

Unless otherwise expressly provided for in this Agreement, the dispute resolution procedures of this paragraph shall be the exclusive mechanism to resolve disputes arising under this Agreement. The parties shall, without delay, continue to perform their respective obligations under this Agreement which are not affected by the dispute. The parties agree to use their best efforts to resolve any dispute(s) that may arise regarding this Agreement. Any dispute that arises under or with respect to this Agreement that cannot be resolved shall be considered to have arisen when one party sends the other party a written notice of dispute. The period for informal negotiations shall be fourteen (14) days from receipt of the written notice of dispute unless such time period is modified by written agreement of the parties. In the event that the parties cannot resolve a dispute by informal negotiations, the parties agree to submit the dispute to mediation to be conducted in accordance with the Construction Industry Mediation Procedures (including procedures for large, complex construction disputes) of the American Arbitration Association in effect at the time of the dispute. Within fourteen (14) days following the expiration of the time period for informal negotiations, the parties shall propose and agree upon a neutral and otherwise qualified mediator. The mediation shall occur at location in Onondaga County, New York, that is mutually agreed upon by the parties. In the event that the parties fail to agree upon a mediator, the parties shall request that the American Arbitration Association appoint a mediator. The period for mediation shall commence upon the appointment of the mediator and shall not exceed sixty (60) days, unless such time period is modified by written agreement of the parties. The decision to continue mediation shall be in the sole discretion of each party. The parties will bear their own costs of the mediation. The fees and expenses of the mediator shall be borne equally by the parties. In the event that the parties cannot resolve a dispute by informal negotiations or mediation, venue for judicial enforcement shall be as provided in this Agreement.

7. Term of Agreement

The term of this Agreement will commence on the Effective Date (as defined below) and will expire on the earlier of the twenty (20)-year anniversary of the Effective Date or the date when the County may undertake County Work in the drainage district easement depicted in the map attached to this Agreement as Exhibit B in accordance with applicable law without encountering Residual Cadmium. If this Agreement expires on the twenty-year anniversary of the Effective Date, the County may, by written notice delivered to Lockheed Martin within 60 days after the expiration date, extend the provisions of this Agreement related to Residual Cadmium for an additional 10-year term. The parties acknowledge that the enforceability of this Agreement does not

depend on whether the remedy approved by NYSDEC in the RAWP is implemented or on any determination by Lockheed Martin, whether or not sanctioned by NYSDEC, to leave Residual Cadmium at the Site. This Agreement may also be terminated by the parties if the parties so determine by the execution of a written instrument evidencing the termination by mutual agreement of the parties.

8. Communications

Any notice, demand, or request, required or agreed to be given by any party, shall be sufficiently given or served if in writing and signed by the party giving it, and delivered by hand with receipt acknowledged (including by national overnight courier, such as Federal Express) or mailed by U.S. mail, certified mail, return receipt requested, addressed to the party to be notified at the party's mailing address set forth below, with optional confirmation sent by facsimile or electronic mail:

County of Onondaga

County of Onondaga
Department of Water Environment Protection
Nicolas Capozza
650 Hiawatha Blvd. West
Syracuse, New York 13204
Phone: (315) 435-2260
Fax: (315) 435-
E-mail: NicolasCapozza@ongov.net

With a copy to:

Onondaga County Dept. of Law
Luis A. Mendez, Esq.
421 Montgomery Street – 10th Floor
Syracuse, New York 13202
Phone: (315) 435-2170
Fax: (315) 446-7162
E-mail: LuisMendez@ongov.net

Lockheed Martin Corporation

Bloody Brook Project Manager
Jill A. Fonte
Lockheed Martin Corporation
Building EP-6, Room 100B
P.O. Box 4840
Syracuse, New York 13221-4840
Phone: (315) 456-1993
Fax: (315) 456-0150
E-mail: jill.a.fonte@lmco.com

With a copy to:

General Counsel
Sandra L. Fenske, Esq.
Lockheed Martin Corporation
EP-5-118, MD 17
P.O. Box 4840
Syracuse, NY 13221-4840
Phone: (315) 456-3598
Fax: (315) 456-0669
E-mail: sandra.fenske@lmco.com

With a copy to:

Director, Office of the Environment
County of Onondaga
David Coburn
421 Montgomery Street – 14th Floor
Syracuse, New York 13202
Phone: (315) 435-2647
Fax: (315) 446-8582
E-mail: DavidCoburn@ongov.net

With a copy to:

Vice President Energy, Environment,
Safety and Health
Lockheed Martin Corporation
6801 Rockledge Drive
Bethesda, MD 20817

Hand deliveries to Lockheed Martin's Syracuse operations shall be made to the Patrol Office in Building 7 located at 497 Electronics Parkway, Liverpool, NY. The County or Lockheed Martin may designate a different person or entity to which notices shall be given by delivering a written notice to that effect to the other party.

9. Entire Agreement

This Agreement shall constitute the entire agreement of the parties regarding its subject matter, and shall supersede any previous oral or written understandings. The Exhibits attached hereto are incorporated herein and made a part of this Agreement. Furthermore, this Agreement may only be amended, modified or supplemented by a written instrument signed by both parties.

10. Compliance with Law

In performing work pursuant to this Agreement, the parties shall comply with all applicable laws, including but not limited to federal, state and local laws and regulations.

11. Governing Law and Venue

This Agreement and any and all issues arising hereunder or relating hereto shall be governed and construed according to the laws of the State of New York without reference to its principles of conflicts of law. All actions or proceedings arising in connection with this Agreement shall be tried and litigated only in the County, State and/or Federal Courts located in the County of Onondaga and State of New York

12. Descriptive Headings

The descriptive headings of the various provisions of this Agreement are included for convenience only, and they are not intended to affect the meaning or construction of any of the provisions of this Agreement.

13. Assignment

This Agreement may not be assigned in whole or in part by Lockheed Martin or the County without the written consent of the other party. However, Lockheed Martin

may unilaterally assign this Agreement in the event of change of ownership of either Lockheed Martin or the business unit located at the Syracuse site.

14. Binding Effect

This Agreement shall benefit and be binding upon the parties to this Agreement and their respective successors.

15. Severability

If any terms or provisions of this Agreement are determined by a court of competent jurisdiction to be invalid, illegal or otherwise unenforceable, such determination shall not affect the validity or enforceability of the remaining terms and provisions of this Agreement or the whole of this Agreement, but such term or provision shall be deemed modified to the extent necessary in the court's opinion to render such term or provision enforceable, and the rights and obligations of the parties shall be construed and enforced accordingly, preserving to the fullest permissible extent the intent and agreement of the parties set forth herein.

16. Waiver

No waiver by either party to this Agreement of any failure or refusal of the other party to comply with its obligations shall be deemed a waiver of any other or subsequent failure or refusal to so comply.

17. Counterparts

This Agreement may be executed in multiple counterparts, and the counterparts, when combined, shall form and constitute a complete agreement.

18. Effective Date

This Agreement shall be effective on the date of execution by both parties (the "Effective Date").

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the date and year hereinafter written.

DATED: 7-9, 2014.

COUNTY OF ONONDAGA

By: Joanne M. Mahoney
Joanne M. Mahoney
County Executive

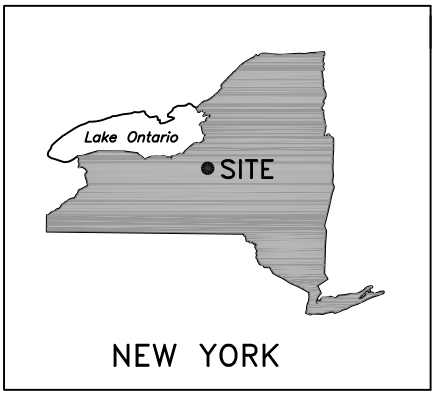
LOCKHEED MARTIN CORPORATION

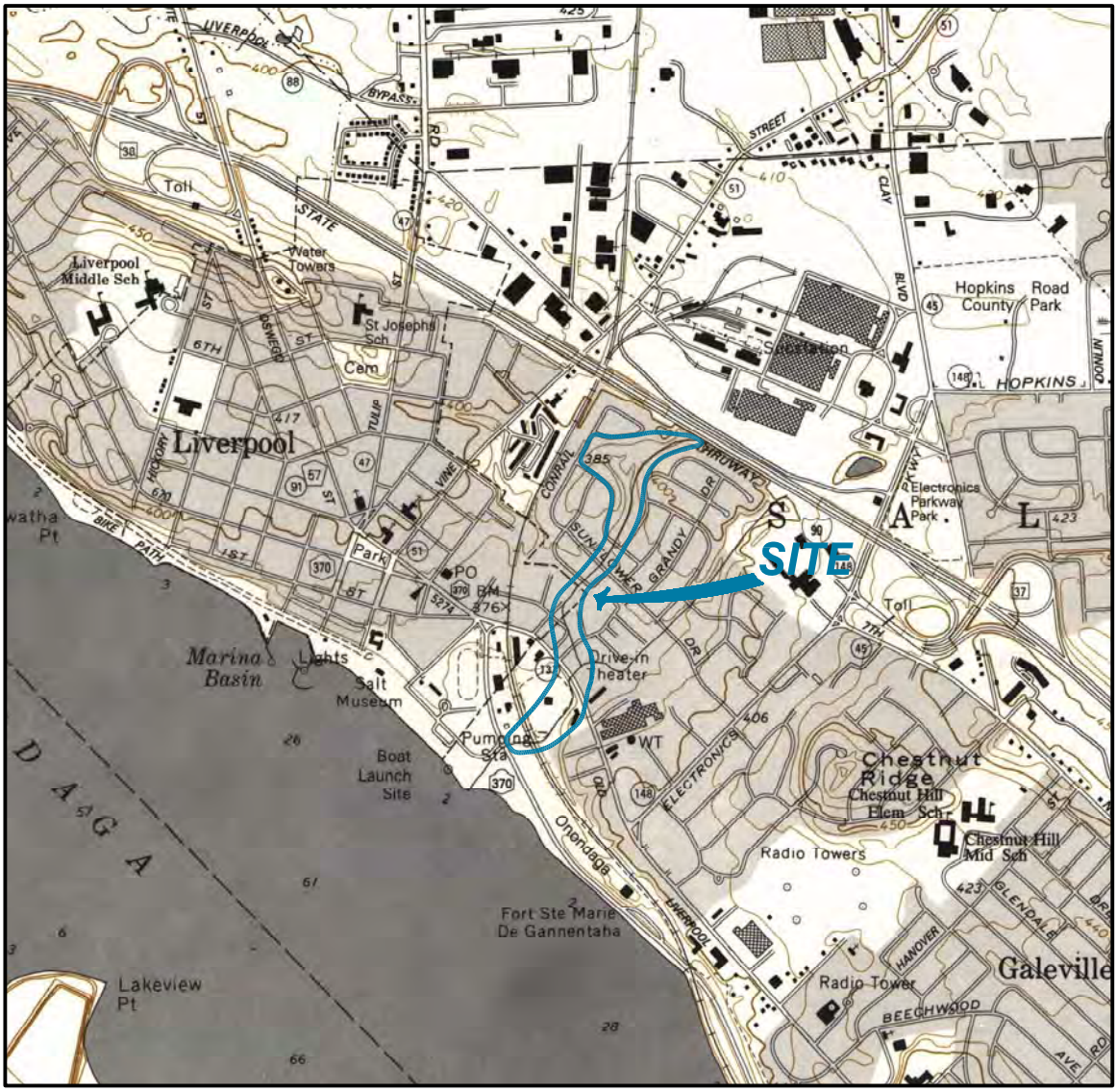
DATED: May 28, 2014

By: _____

Michael J . Sarpu
[print the name signed above]

Its: Vice President Operations
[title]





0' 2000' 4000'

APPROXIMATE SCALE

REFERENCE:

1. NYSDOT 7.5 MIN TOPOGRAPHIC MAP OF SYRACUSE WEST, QUADRANGLE 1990, SCALE: 1" = 2000'.

AECOM

LOCKHEED MARTIN CORPORATION

SITE LOCATION MAP

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	EXHIBIT
EXHIBITA.dwg	—	60303286	04 / 2014	A

Plotted By: bookasr
Layout-Sheet Name: EXHIBIT A
Plot File Date Created: Apr/01/2014 9:41 AM

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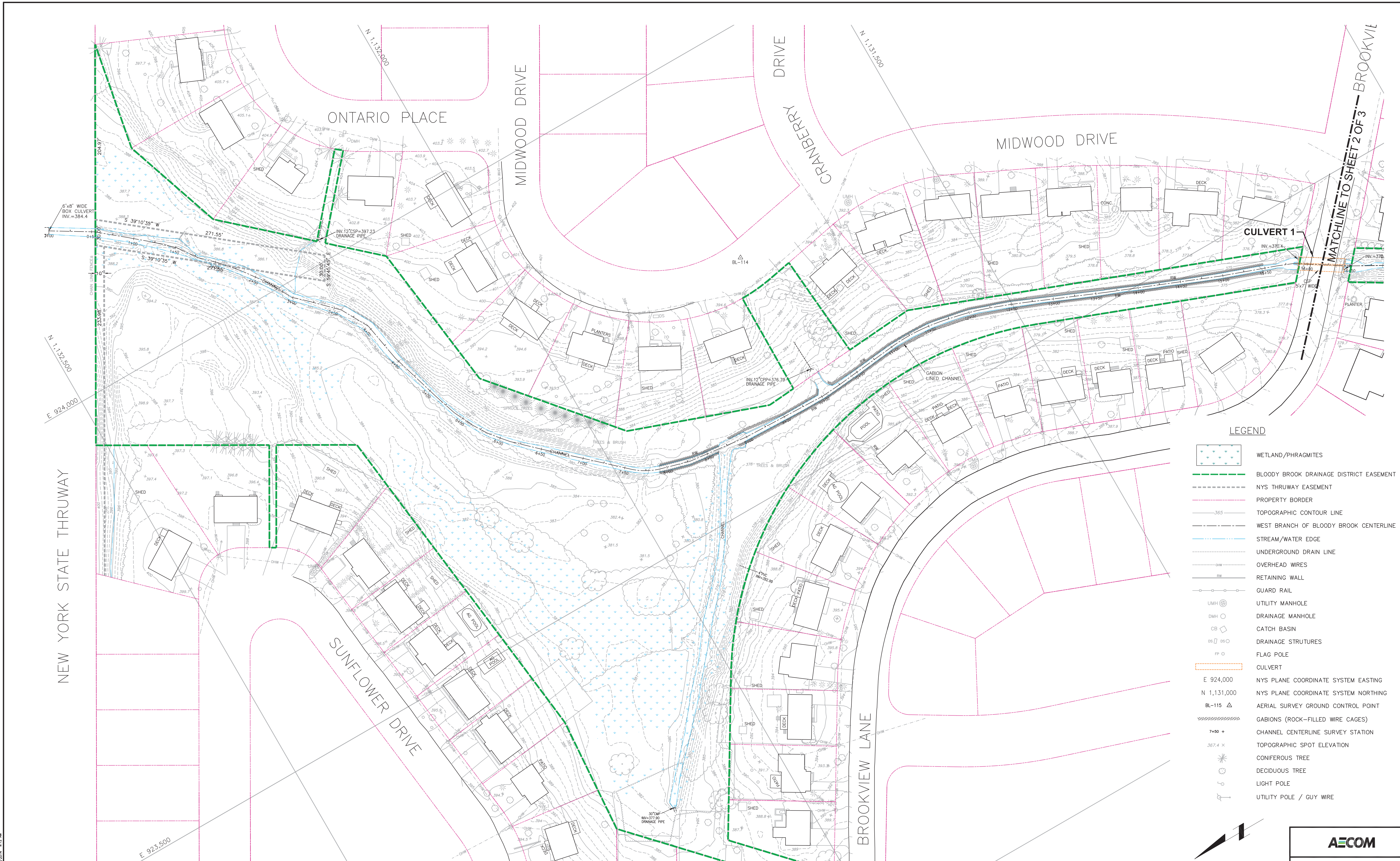

ONTARIO PLACE
MIDWOOD DRIVE
CRANBERRY DRIVE
MIDWOOD DRIVE
BROOKVIEW LANE
SUNFLOWER DRIVE
NEW YORK STATE THRUWAY
CULVERT 1
MATCHLINE TO SHEET 2 OF 3
6'x8' WIDE BOX CULVERT INV.=384.4
INV.12"CSP=397.23 DRAINAGE PIPE
INV.12"CPP=376.79 DRAINAGE PIPE
GABION LINED CHANNEL
30"CMP INV=377.90 DRAINAGE PIPE
E 924,000
E 923,500
E 923,000
N 1,132,000
N 1,131,500
N 1,132,500
BL-114
LEGEND
WETLAND/PHRAGMITES
BLOODY BROOK DRAINAGE DISTRICT EASEMENT
NYS THRUWAY EASEMENT
PROPERTY BORDER
TOPOGRAPHIC CONTOUR LINE
WEST BRANCH OF BLOODY BROOK CENTERLINE
STREAM/WATER EDGE
UNDERGROUND DRAIN LINE
OVERHEAD WIRES
RETAINING WALL
GUARD RAIL
UTILITY MANHOLE
DRAINAGE MANHOLE
CATCH BASIN
DRAINAGE STRUTURES
FLAG POLE
CULVERT
E 924,000 NYS PLANE COORDINATE SYSTEM EASTING
N 1,131,000 NYS PLANE COORDINATE SYSTEM NORTHING
BL-115 AERIAL SURVEY GROUND CONTROL POINT
GABIONS (ROCK-FILLED WIRE CAGES)
7+50 CHANNEL CENTERLINE SURVEY STATION
367.4 TOPOGRAPHIC SPOT ELEVATION
CONIFEROUS TREE
DECIDUOUS TREE
LIGHT POLE
UTILITY POLE / GUY WIRE
0' 50' 100'
APPROXIMATE SCALE

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

AECOM

LOCKHEED MARTIN CORPORATION

SITE MAP
SHEET 1 OF 3

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	EXHIBIT
EXHIBITB.dwg	--	60303286	04 / 2014	B-1

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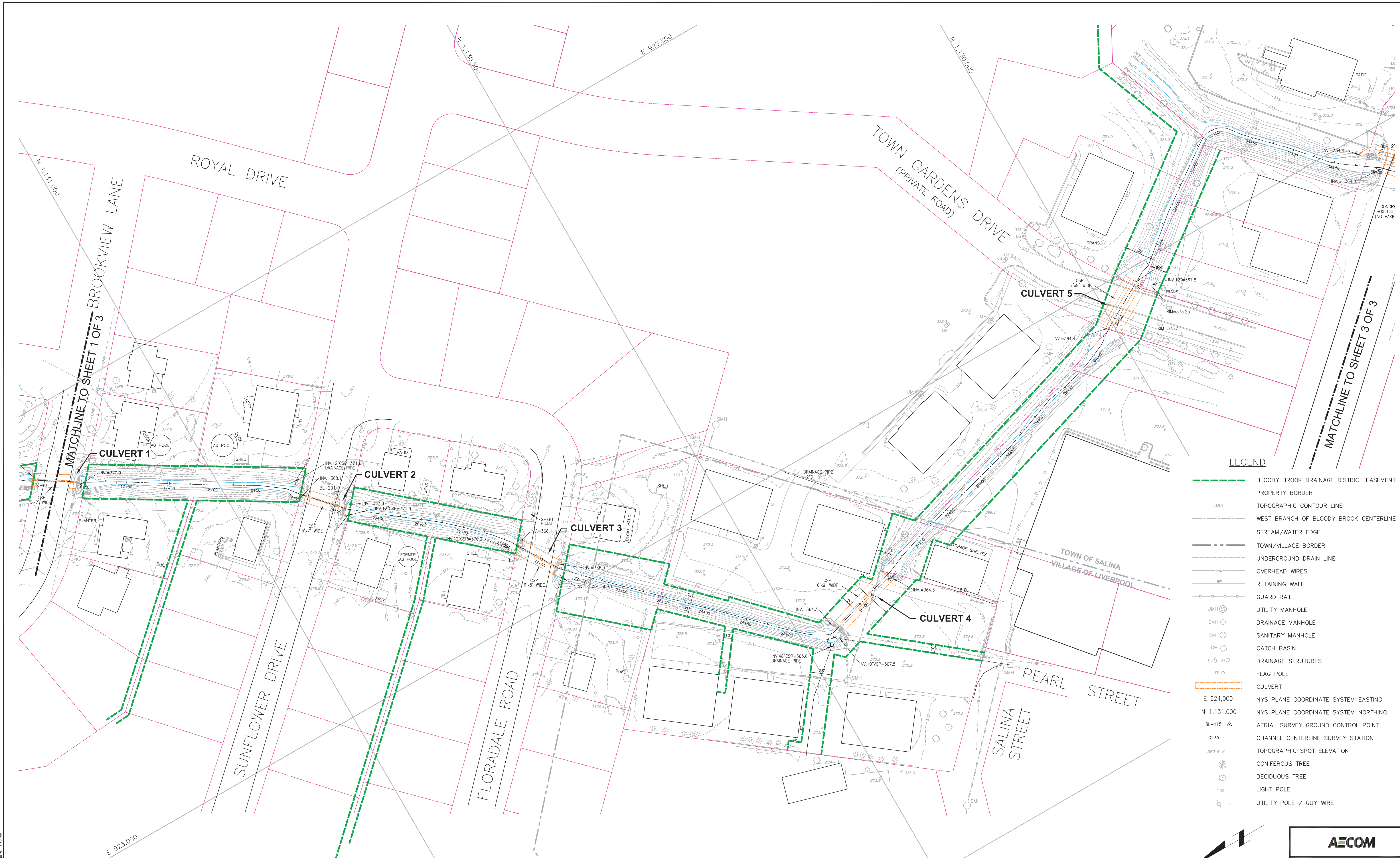
ROYAL DRIVE
BROOKVIEW LANE
TOWN GARDENS DRIVE
(PRIVATE ROAD)
SUNFLOWER DRIVE
FLORADALE ROAD
PEARL STREET
SALINA STREET
TOWN OF SALINA
VILLAGE OF LIVERPOOL
MATCHLINE TO SHEET 1 OF 3
MATCHLINE TO SHEET 3 OF 3
CULVERT 1
CULVERT 2
CULVERT 3
CULVERT 4
CULVERT 5
N 1,131,000
N 1,130,500
N 1,130,000
E 923,500
E 923,000
E 922,500
CSP 5'x7' WIDE
CSP 5'x7' WIDE
CSP 6'x8' WIDE
CSP 6'x9' WIDE
CSP 7'x9' WIDE
AG POOL
FORMER AG POOL
SHED
PATIO
DECK
PLANTER
SHEET PILES
STORAGE SHELVES
LEGEND
BLOODY BROOK DRAINAGE DISTRICT EASEMENT
PROPERTY BORDER
TOPOGRAPHIC CONTOUR LINE
WEST BRANCH OF BLOODY BROOK CENTERLINE
STREAM/WATER EDGE
TOWN/VILLAGE BORDER
UNDERGROUND DRAIN LINE
OVERHEAD WIRES
RETAINING WALL
GUARD RAIL
UTILITY MANHOLE
DRAINAGE MANHOLE
SANITARY MANHOLE
CATCH BASIN
DRAINAGE STRUTURES
FLAG POLE
CULVERT
E 924,000 NYS PLANE COORDINATE SYSTEM EASTING
N 1,131,000 NYS PLANE COORDINATE SYSTEM NORTHING
BL-115 AERIAL SURVEY GROUND CONTROL POINT
7+50 CHANNEL CENTERLINE SURVEY STATION
367.4 TOPOGRAPHIC SPOT ELEVATION
CONIFEROUS TREE
DECIDUOUS TREE
LIGHT POLE
UTILITY POLE / GUY WIRE
0' 50' 100'
APPROXIMATE SCALE

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

AECOM

LOCKHEED MARTIN CORPORATION

SITE MAP
SHEET 2 OF 3

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	EXHIBIT
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N 1,129,500

N 1,129,000

E 923,000

N 1,128,500

E 922,500

E 922,000

OLD LIVERPOOL ROAD (C.R. No. 137)

MATCHLINE TO SHEET 2 OF 3

ONONDAGA LAKE PARKWAY

PATIO

CSP 5'x7' WIDE

CONCRETE BOX CULVERT (NO BASE FND.)

BL-127

BL-115

INV.=364.4

INV.±=364.0

INV.±=364.0

INV.24"=362.51

INV.±=361.2

INV.±=360.8

INV.±=360.9

54" RCP

INV.±=360.9

INV.±=360.8

INV.±=360.9

BOX CULVERT

ARCH BOX CULVERT INV.±=362.0

SHED

PARKING

CONSTRUCTION AREA

(OPEN STORAGE)

BRUSH

ASPHALT PARKING LOT

CONCRETE CURB

LEGEND

- BLOODY BROOK DRAINAGE DISTRICT EASEMENT
- PROPERTY BORDER
- 365 TOPOGRAPHIC CONTOUR LINE
- WEST BRANCH OF BLOODY BROOK CENTERLINE
- STREAM/WATER EDGE
- UNDERGROUND DRAIN LINE
- OHW OVERHEAD WIRES
- RW RETAINING WALL
- GUARD RAIL
- RAILROAD TRACKS
- UMH UTILITY MANHOLE
- DMH DRAINAGE MANHOLE
- CB CATCH BASIN
- DS DRAINAGE STRUTURES
- FP FLAG POLE
- CULVERT
- E 924,000 NYS PLANE COORDINATE SYSTEM EASTING
- N 1,131,000 NYS PLANE COORDINATE SYSTEM NORTHING
- BL-115 AERIAL SURVEY GROUND CONTROL POINT
- 7+50 + CHANNEL CENTERLINE SURVEY STATION
- 367.4 × TOPOGRAPHIC SPOT ELEVATION
- CONIFEROUS TREE
- DECIDUOUS TREE
- LIGHT POLE
- UTILITY POLE / GUY WIRE

0' 50' 100'

APPROXIMATE SCALE

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.
2. THE VALUES SHOWN ARE BASED ON NEW YORK (CENTRAL ZONE) STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM 1983.

AECOM

LOCKHEED MARTIN CORPORATION

SITE MAP
SHEET 3 OF 3

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	EXHIBIT
EXHIBITB.dwg	—	60303286	04 / 2014	B-3

Plotted By: bostonr
Drawing Name: EXHIBIT B-3
Plot File Date Created: Apr/01/2014 - 8:18 AM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\EXHIBITB.DWG

Exhibit C
Remedial Action Construction Schedule
West Branch of Bloody Brook
Bloody Brook Voluntary Cleanup Program
Onondaga County, New York

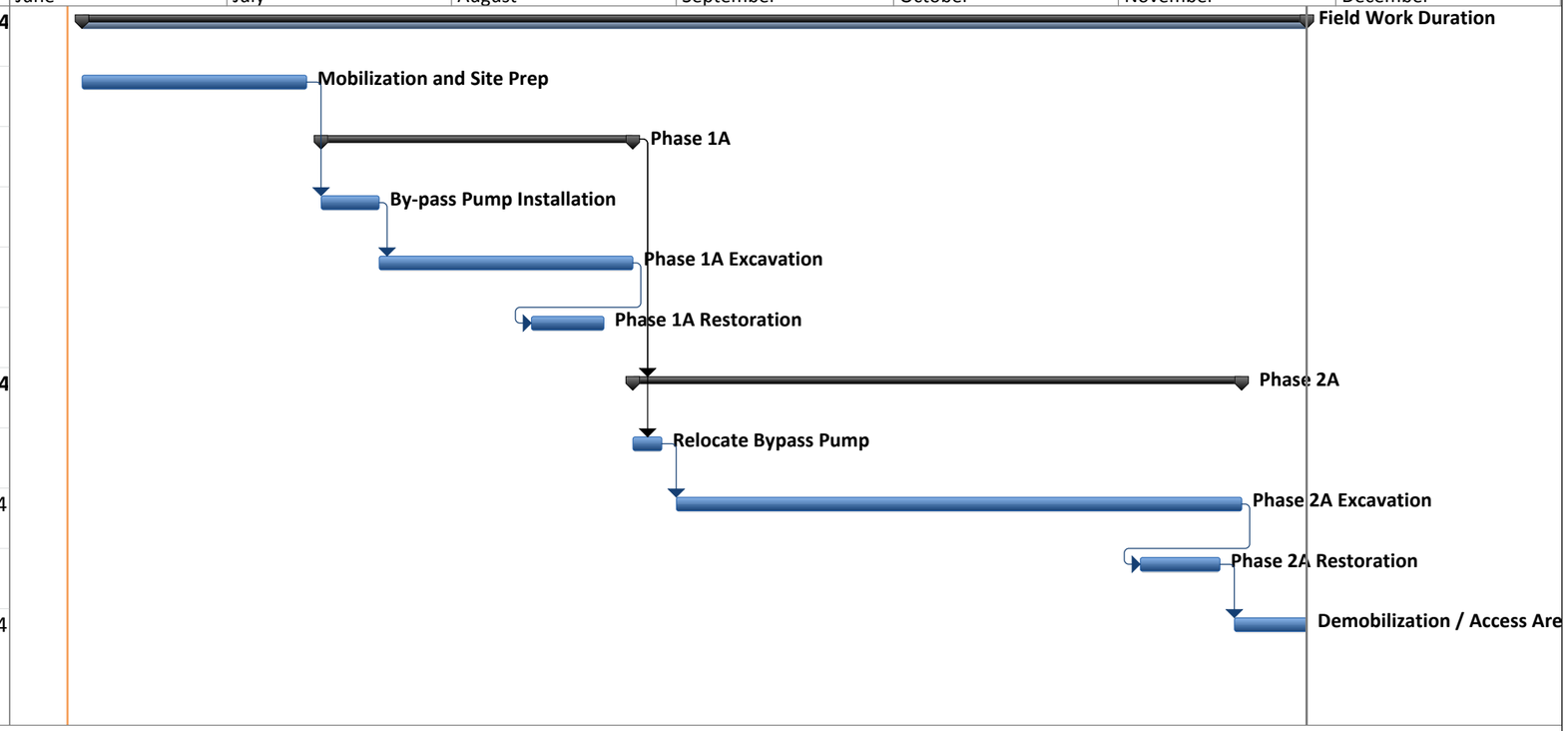
Submit ACOE Permit to NYSDEC	February 7, 2014
Initiate Waste Stabilization Bench Scale Test	May 7, 2014
NYSDEC 2014 Construction Work Plan Approval	May 29, 2014
Submit 2014 Restoration Work Plan to NSYDEC	May 30, 2014
Mobilization and Site Preparation	June 11, 2014
Submit Results of Waste Stabilization Bench Scale Test to NYSDEC	June 25, 2014
NYSDEC 2014 Restoration Work Plan Approval	July 9, 2014
Begin 2014 Construction Activities	July 14, 2014
Complete 2014 Construction Activities	November 26, 2014
Submit 2015 Construction Work Plan Addendum to NYSDEC	January 31, 2015
NYSDEC 2015 Construction Work Plan Addendum Approval	March 1, 2015
Begin 2015 Construction Activities	May 1, 2015
Complete 2015 Construction Activities	November 15, 2015
Submit 2016 Construction Work Plan Addendum to NYSDEC	January 31, 2016
NYSDEC 2016 Construction Work Plan Addendum Approval	March 1, 2016
Begin 2016 Construction Activities	May 1, 2016
Complete 2016 Construction Activities	November 4, 2016

NOTE:

1) Dates are approximate and subject to change due to field conditions and unforeseen difficulties.
2) Monthly progress reports will be submitted to New York State Department of Environmental Conservation (NYSDEC) by the 10th of each calendar month.

Exhibit C
2014 Remedial Action Construction Schedule
West Branch of Bloody Brook
Bloody Brook Voluntary Cleanup Program
Onondaga County, New York

ID	Task Name	Duration	Start	Finish
1	**Field Work Duration**	**121 days**	**Wed 6/11/14**	**Wed 11/26/14**
2	Mobilization and Site Prep	23 days	Wed 6/11/14	Fri 7/11/14
3	**Phase 1A**	**31 days**	**Mon 7/14/14**	**Mon 8/25/14**
4	By-pass Pump Installation	6 days	Mon 7/14/14	Mon 7/21/14
5	Phase 1A Excavation	25 days	Tue 7/22/14	Mon 8/25/14
6	Phase 1A Restoration	8 days	Tue 8/12/14	Thu 8/21/14
7	**Phase 2A**	**60 days**	**Tue 8/26/14**	**Mon 11/17/14**
8	Relocate Bypass Pump	4 days	Tue 8/26/14	Fri 8/29/14
9	Phase 2A Excavation	56 days	Mon 9/1/14	Mon 11/17/14
10	Phase 2A Restoration	9 days	Tue 11/4/14	Fri 11/14/14
11	Demobilization / Access Area Restoration	8 days	Mon 11/17/14	Wed 11/26/14



Project: Bloody
Date: Mon 6/9/

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline			
Split	External Tasks	Inactive Summary	Manual Summary	Progress			
Milestone	External Milestone	Manual Task	Start-only				
Summary	Inactive Task	Duration-only	Finish-only				

APPENDIX F

Field Sampling Plan

BLOODY BROOK

ONONDAGA COUNTY

LIVERPOOL, NEW YORK

Site Management Field Sampling Plan

Prepared for:

Lockheed Martin Corporation
497 Electronics Parkway
Building EP-6, Room 100B
Liverpool, New York 13088

Prepared by:

AECOM
5015 Campuswood Drive, Suite 104
E. Syracuse, NY 13057

March 2019

TABLE OF CONTENTS

List of Figures

List of Attachments

1. Introduction

The purpose of this Field Sampling Plan (FSP) is to describe sample collection procedures for work conducted in association with the Site Management Plan (SMP) for the Lockheed Martin Corporation (Lockheed Martin) Bloody Brook site located in Onondaga County, New York ("site").

Limited field sampling is anticipated for management activities for the site beyond biological monitoring that includes sampling of crayfish from the brook for cadmium analysis two years and four years following the completion of excavation and restoration activities (2018 and 2020). Baseline biological monitoring was completed in 2014 prior to the initiation of remedial activities. The first year of post-remediation monitoring was completed in August 2018, and the final year is anticipated for summer 2020. Limited soil samples may be required per the Institutional Control (IC) Plan provided in Section 3 of the SMP, and sampling for New York State Department of Environmental Conservation (NYSDEC) approval of imported soil may be required if additional clean fill needs to be transported to and used on site. Waste characterization sampling may be required if potentially contaminated material is to be transported for offsite disposal.

2. Sampling Methodologies

This section provides information specific to the actual field methods that will be employed in support of the biological monitoring and other potential soil sampling related to site management activities. Sample collection, equipment decontamination, ground surface restoration, sample packaging, analytical protocols, and quality control sample collection are discussed in this section.

2.1 Site Soil Sample Collection

If it is determined that soil samples are required per the IC Plan in the SMP (Section 3), sample collection will be performed between the hours of 8:00 am and 5:00 pm, and every effort will be made to minimize any inconvenience (e.g., noise) to residents of the area. Sampling documentation will consist of detailed notes made during sampling activities that include recording of sample locations, sample depth, soil lithology, and site conditions (e.g., weather). Depending on the depth of the soil sample required, either a stainless steel hand auger or a track-mounted Geoprobe® will be used to create the boring and to collect the soil sample. The diameter of the boring will be approximately 2-inches. The soil in each sample interval to be collected will be thoroughly mixed prior to placement in laboratory supplied sample containers. The samples will be collected and handled using new, disposable nitrile gloves. The hand auger or split spoons will be decontaminated, and each of the borings will be backfilled with the excess soil. When backfilling a boring, the excess soil will be placed in the borehole at approximately the depth it was removed.

Ground Surface Restoration

All efforts will be made to limit the amount of surficial disturbance potentially caused by the sampling crew and equipment. At each sample location, an approximate 2-inch diameter patch of the vegetative cover will be removed down to the root and set aside to be replaced on the surface of the sample location after the boring has been backfilled. Any damage that may occur to the lawns where soil borings are advanced will be repaired with topsoil and grass seed following the completion of the field activities. If large areas require restoration, appropriate measures (e.g., hay bales) will be implemented to ensure that the work does not cause increased erosion.

Analytical Protocols

All site soil samples collected pursuant to this FSP will be analyzed by a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certified laboratory for cadmium (Method SW 846 6010B). The laboratory will provide a NYSDEC Analytical Service Protocol

(ASP) Category B deliverable data package to allow for data validation if determined to be required. Details related to analytical data quality are provided in the Quality Assurance Project Plan (QAPP) included as Appendix G of the SMP.

To support the potential future validation data needs, quality control samples (blind field duplicate, matrix spike, and matrix spike duplicate samples) will be collected in the field and will be analyzed by the laboratory.

Quality Control Sample Collection

Quality control samples will be collected to provide necessary data for future validation of the laboratory data, if required. Blind field duplicate, matrix spike, and matrix spike duplicate samples will be collected at a frequency of one for each 20 samples collected.

Blind field duplicate samples will be created by collecting double volume for a sample location then splitting the sample volume between two sample containers to be used for the sample and the blind field duplicate sample. The matrix spike and matrix spike duplicate samples will be created by providing triple sample volume for a sample location then splitting the sample volume into three sample containers to be used for the sample, matrix spike sample, and matrix spike duplicate sample.

2.2 Sampling of Imported Fill

If Lockheed Martin is required to place additional clean imported fill after excavation activities, samples from the proposed clean source will be collected and analyzed in accordance with Section 5.4 of DER-10 in order to receive NYSDEC approval to use the source. Samples for volatile organic compounds (VOCs) in clean fill will be collected with the use of Encore® samplers or similar (See SMP QAPP).

2.3 Waste Characterization Sampling

If required, waste characterization samples will be collected in accordance with the methods and frequency described herein. For the collection of each sample, material will be collected from locations and at a frequency required by the waste receiving facility within the area to be sampled. Methods for VOC sample collection and homogenization of soil for analyses other than VOCs is described below.

Collection of VOC samples

Soil to be sampled for VOC analysis will be collected using appropriate sampling tools (e.g., stainless steel hand auger) from a discrete sample location. Samples will be collected from a location chosen to be representative of the larger area. Samples will be collected using new, disposable nitrile gloves and placed directly into a sample jar provided by a New York State certified laboratory.

Field Sample Homogenization

Samples collected for analysis other than VOCs and listed below will be field composited from composite sample locations within the lager area to be sampled. Collected grab samples from the composite sample locations will be transferred from the sampler to a large plastic bag and will be homogenized using new, disposable nitrile gloves. An appropriate mass of the homogenized material will be transferred to a laboratory-supplied sample container(s) for shipment to the laboratory. Samples will be stored and handled according to procedures outlined in this work plan.

Spoils

Soil collected from borings that are not sent to a laboratory for analysis will be placed in the open boring from which it came. The remaining void space left from the boring will be filled with sand or similar.

Equipment and tools that have come in contact with samples and non-contact sampling equipment will either be disposed of after each use or will be decontaminated and re-used according to the procedure described below.

Ground Surface Restoration

All efforts will be made to limit the amount of surficial disturbance potentially caused by the sampling crew and equipment. At each soil sample location, a patch of the vegetative cover will be removed down to the root and set aside to be replaced on the surface of the sample location after the boring has been backfilled. Any damage that may occur to the vegetated areas where soil borings are advanced will be repaired and seeded following the completion of the field activities.

Field Observation and Documentation of Samples

Field observations regarding each sample will be recorded on a field log. In addition, sampling documentation will consist of detailed notes made during sampling activities that include recording of sample locations, sample depth, and site conditions (e.g., weather). Sample locations will be identified using a small flag or similar article and surveyed prior to demobilization from the site.

Sample Analysis

Analyses conducted under this Work Plan will be conducted by a laboratory certified under the NYSDOH ELAP for the constituents to be analyzed and to the extent that such certification is available. The samples for waste characterization will be submitted for laboratory analysis for the parameters presented in the table below.

Analyte(s)	**Analytical Method**
Sulfide (Reactive)	SW-846-C7
Reactivity	SW-846-C7
Ignitability	SW-846-C7
TCLP RCRA 8 Metals	SW-846-1311/SW846-7470 (Mercury); SW-846-1311/SW-846-6010 (other RCRA metals)
PCBs	SW-846-1311/SW-846-8082
TCLP SVOCs	SW-846-1311/SW-846-8270
TCLP VOCs	SW-846-1311/SW-846-8260
TCLP Pest/Herb	SW-846-1311/SW-846-8081
Percent Solids	SM-2540.B

2.4 Biological Monitoring

The objective of the biological monitoring is to document cadmium concentrations in aquatic biota following the completion of the remedial activities at the site. Pre-remedial data was collected to serve as a baseline data set in 2014. Collectively, these data will be used in part to support the evaluation of the effectiveness of the site remedial program in mitigating potential cadmium impacts to Bloody Brook.

Crayfish are the target organism for this work because they are known to accumulate cadmium, and they are relatively less mobile than other resident aquatic organisms (e.g., fish). Crayfish have been observed in West Branch of Bloody Brook and Bloody Brook and have been sampled previously by both NYSDEC and Lockheed Martin.

Crayfish will be collected from three general locations or stations within the brook, including an upper, middle, and lower location (Figure 1), consistent with the locations sampled during the baseline sampling

and the post-remediation sampling in 2018. Each location will also be photographed by the field crew. Five samples of crayfish will be collected from each of the three sampling locations. In the event that sufficient number of crayfish cannot be collected, alternative or other species will be considered. The crayfish samples will be collected in accordance with the procedures described below, processed, and sent to a laboratory for cadmium analyses.

Methodology

This section describes the general methods that will be used to collect, process, and analyze the biological tissue samples. Additional details on collection methods are presented in the standard operating procedure (SOP) (Attachment 1).

Collection

Five crayfish samples will be collected from each of the specified three sampling locations, for a total of 15 samples. The crayfish that are retained for analyses will be of uniform size to the extent practicable. It is estimated that each crayfish sample will be a composite sample of 3 to 5 like-size individuals, although fewer (or more) organisms per sample may be collected depending on individual crayfish weights. In order to have sufficient tissue for analysis, each sample will have a minimum sample weight of approximately 20 grams.

Crayfish will be collected using a methodology appropriate for sample conditions and may include the use of a backpack electrofishing unit, hand netting, or seining. Details on these collection methods are included in the SOP in Attachment 1 of this appendix. Following sample collection, each crayfish will be weighed and measured (carapace length), and samples will be placed in an appropriately-labeled sample jar or clean sealable bag. Samples will be given a unique laboratory ID that specifies the location and sample number. For example, sample CR-18-1-001 would represent a crayfish sample (CR), collected in 2018 (-18), from location 1 (-1), and the first replicate (-001). After processing, samples will be placed in coolers with ice and shipped to the laboratory for analysis. The sample handling, packing, and shipping procedures are further described in sections below.

Laboratory Analyses

Each of the biota samples will be analyzed by a laboratory recognized by the National Environmental Lab Accreditation (NELAC) for total cadmium using USEPA Method 6020 (ICP-MS). The contracted laboratory will follow the USEPA method, and the appropriate Quality Assurance/Quality Control (QA/QC) procedures detailed below. The laboratory will achieve a Method Detection Limit (MDL) of 0.006 milligrams per kilogram (mg/kg) and a Reporting Limit (RL) of 0.1 mg/kg.

Quality Assurance/Quality Control

QA/QC procedures will be implemented to ensure data needs for completeness, accuracy, and precision. The laboratory will utilize QC samples to assess the validity of the analytical results of field samples. The laboratory QC samples will include a matrix spike/matrix spike duplicate collected once per event.

All laboratory cadmium analyses will follow USEPA Method 6020. The laboratory will ensure that the sample preparation and analyses are performed within the specified holding times for each analysis and perform an internal laboratory quality control report as well as note any QC deficiencies in the final laboratory report. Preservation will involve cooling the samples to 4 degrees Celsius (°C) during transportation, and storage at the laboratory at a temperature of -20 °C until analysis is performed. Holding time will be no more than 180 days to analysis.

Sample Frequency

Sampling events were to be completed two and four years following remediation (2018 and 2020). The first post-remediation biological monitoring event was completed in August 2018, and the final year of biological monitoring is anticipated for summer 2020. Sampling for each event will be completed during the same general time frame to avoid possible seasonal fluctuations in cadmium concentrations. Following the four year sampling event the data will be evaluated and a determination will be made regarding the necessity for additional monitoring events.

3. Sample Packaging

Prior to the sampling activities, sample containers will be pre-cleaned by the laboratory and delivered to the field representative or a store bought new clean sealable bag will be used. The field representative will place a label on the sample containers. As samples are collected, the label will be used to record the sample identifier, date and time of sample collection, and the name of the person collecting the sample. After the samples have been collected, they will be kept in a cooler with ice and will be delivered to the laboratory under proper chain of custody.

4. Equipment Decontamination

Field decontamination will be minimized to the extent practical by using disposable equipment or pre-cleaned reusable equipment. However, as necessary, reusable sampling equipment will be decontaminated before use. The decontamination procedure will consist of a wash with a phosphate-fee detergent and potable water, a potable water rinse, a 10% nitric acid rinse, and a final distilled water rinse. The decontaminated equipment will then be placed in a plastic bag or wrapped in aluminum foil to keep the equipment clean.

5. Data Validation

The laboratory will provide a NYSDEC ASP Category B deliverable data package for all samples in order to allow for data validation as needed. Copies of the laboratory reports will be forwarded to a third party data validator. The data validator will review the project quality control samples, holding times, and laboratory precision. A validation report will be obtained for each laboratory analytical report.

6. Green and Sustainable Remediation

Per DER-10, green and sustainable practices have been considered in the development of this Field Sampling Plan and will be utilized during the field sampling activities. By using a hand auger when possible to collect soil samples, energy consumption will be minimized and no greenhouse gases or pollutants will be emitted. In addition, vehicle idling will be reduced with the requirement that all vehicles and equipment will be shut off when not in use for more than five minutes. Mobilization and demobilization to and from the site by field personnel will be minimized, and carpooling will be used when feasible. Material management and waste reduction practices will be implemented for the project. For example, paper usage and disposal/recycling will be minimized by requesting that all analytical data and analytical reports be delivered in an electronic format.

LEGEND:

- APPROXIMATE BIOTA MONITORING SAMPLE LOCATION
- BLOODY BROOK
- APPROXIMATE SITE BOUNDARY

NOTE:

1. BASE MAP SOURCE: ESRI ARCGIS STREET MAP.

0 800 1,600 Feet

GRAPHIC SCALE

AECOM

LOCKHEED MARTIN CORPORATION

BIOLOGICAL MONITORING LOCATIONS

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
Bio Mon Plan.dwg	---	60338140	8 / 2017	1

Plotted By: Bookasr
Layout-Sheet Name: 11X17
Plot File Date Created: Aug/31/2017 2:08 PM

Filename: N:\MARKETING\PROPOSALS\LOCKHEED MARTIN – BLOODY BROOK\CAD\BIO MON PLAN.DWG

Standard Operating Procedure: Crayfish Sampling

I. Introduction

The following procedures describe the general methodologies that will be used in the field to collect crayfish.

II. Pre-Collection

Staff assigned the responsibility of collecting crayfish will be provided with the following information:

- Work documents (Biological Monitoring Plan, Health and Safety Plan);
- Water body name and site maps;
- Number and size of each species to be collected;
- Collecting and processing procedures;
- Special instructions (if any);
- Appropriate fisheries office contact; and
- Sampling permit.

III. Equipment

The following collection equipment and materials will be available, as required, during crayfish sampling:

- Personal protective equipment (as required by the health and safety plan);
- Backpack electrofishing equipment;
- Dip nets with non-conductive handles;
- Chest or hip waders;
- Measuring board or ruler;
- Top-loading electronic and suspended-weight spring balances;
- Insulated coolers with ice;
- Plastic sealable bags and indelible ink markers;
- Camera;
- Global positioning system (GPS); and
- Field notebook.

IV. Field Notes

Field notes will be recorded during sampling activities, and at a minimum, will include the following:

- Names of field crew and oversight personnel;
- General weather conditions;
- Date, time, and general capture location (including GPS location);

- Capture technique;
- Sample duration;
- General observations of crayfish habitat, abundance, and diversity; and
- Photograph number when pictures are taken.

V. Collection Procedures

Crayfish will be collected using approved sampling techniques. State personnel (conservation officers) will be notified of the sampling activities prior to commencing field work. Only those target species identified in the monitoring plan and scientific collectors permit will be retained. Collection of other species may occur when target species are absent. Non-target species will be released back to the system.

The following procedures will be used, as necessary, to collect crayfish:

A. Backpack Electrofishing

The following procedures describe the use of a backpack electrofishing unit to collect crayfish. Electrofishing activities will be temporarily halted when any persons, pets, or livestock are observed in the water or on the shore in close proximity to the electrofishing unit.

1. The field crew will don personal protective equipment (non-conductive waders and gloves, etc.), set up the electrofishing equipment, and test it upon arrival at the site.

2. The backpack operator will be responsible for control of the on-off switch on the anode handle, operation of the control equipment, and for capturing crayfish. The remaining field crew will work alongside the backpack operator and will capture crayfish.

3. Electricity will be applied to the water by actively maintaining the on-off switch in the closed position while the control equipment is operative.

4. The electrical current will be set to stun the crayfish, but should not cause mortality.

5. Target species of appropriate size will be collected using non-conductive dip-nets and will be placed in sealable plastic bags until they can be transferred to a cooler with ice.

6. Backpack electrofishing batteries will be recharged as needed.

B. Hand-Netting

The following procedures describe the use of dip-nets and hand-capture techniques to collect crayfish:

1. The field crew will move along the water's edge to find crayfish. Crayfish will be captured by hand or by dip-net as they are spotted, and will be tracked and captured as they swim.

2. Target species of appropriate size will be placed into sealable plastic bags, and then into a cooler with ice. Non-target species will be noted in the field notebook.

C. Seine-Netting

The following procedures describe the use of seines to collect crayfish:

1. The field crew will ready the appropriate sized seines (length, depth, and mesh size) for site conditions prior to field sampling.

2. One or two crew members will hold the seine in place, while an additional crew member lifts rocks upstream of the seine to dislodge crayfish. Crew members will then lift the net to collect crayfish.

3. Target species of appropriate size will be removed from the seines and will be placed into sealable plastic bags, and then into a cooler with ice. Non-target species will be counted and noted in the field notebook.

VI. Sample Handling

The following identifies the temporary storage procedures that will be used to preserve crayfish in the field prior to sample processing, handling, and shipment to the laboratory:

1. Measure and weigh each crayfish after collection, as necessary. The carapace length (tip of rostrum to posterior edge of carapace) will be measured to the nearest 0.1 M with calipers to ensure that appropriate sized crayfish are taken. Weight will be taken to ensure that minimum sample mass requirements are satisfied.

2. Count the number of crayfish to ensure that the correct amount is taken.

3. Transfer crayfish to sealable plastic bags (if not done previously) and label with sampling date and capture location, and place in coolers with ice until field processing can occur.

APPENDIX G

Quality Assurance Project Plan

BLOODY BROOK

ONONDAGA COUNTY

LIVERPOOL, NEW YORK

Site Management
Quality Assurance Project Plan

Prepared for:

Lockheed Martin Corporation
497 Electronics Parkway
Building EP-6, Room 100B
Liverpool, New York 13088

Prepared by:

AECOM
5015 Campuswood Drive, Suite 104
E. Syracuse, NY 13057

Table of Contents

List of Tables

1. INTRODUCTION

The purpose of this Quality Assurance Project Plan (QAPP) is to document and establish criteria for conducting monitoring and sampling at a predetermined quality for work conducted in association with the Site Management Plan (SMP) for the Lockheed Martin Corporation (Lockheed Martin) Bloody Brook site located in Onondaga County, New York ("site").

Limited field sampling is anticipated for management activities for the site beyond biological monitoring that includes sampling of crayfish from the brook for cadmium analysis two years and four years following the completion of excavation and restoration activities (2018 and 2020). Baseline biological monitoring was completed in 2014 prior to the initiation of remedial activities. Limited soil samples may be required per the Institutional Control (IC) plan provided in Section 3 of the SMP, and sampling for New York State Department of Environmental Conservation (NYSDEC) approval of imported soil may be required if additional clean fill needs to be transported to and used on site.

2. FIELD SAMPLING

2.1 Field Sampling Procedures

Procedures for field sampling activities are included in Appendix F (Field Sampling Plan) of the SMP.

2.2 Equipment Decontamination

Field decontamination will be minimized to the extent practicable by using disposable equipment or pre-cleaned reusable equipment. However, as necessary, reusable sampling equipment will be decontaminated before use. The decontamination procedure will consist of a wash with a phosphate-free detergent and potable water, a potable water rinse, a 10 percent nitric acid rinse, and a final distilled water rinse. The decontaminated equipment will then be placed in a plastic bag or wrapped in aluminum foil to keep the equipment clean.

3. SAMPLE HANDLING

3.1 Sample Identification and Labeling

Collected samples will be assigned a unique identification using the sample location or other sample-specific identifier.

For soil samples, the sample identification will adhere to the following example format:

SB-1-072819-0910 (Sample location-MMDDYY-Sample depth)

For biological samples, the sample identification will adhere to the following example format:

CR-19-1-01(Crayfish sample collected in 2019 from Location 1, and the first replicate)

Affixed to each sampling container will be a non-removable label on which the following information will be recorded with permanent water-proof ink: client, project name, preservative, collection date and time, sample identification, requested analysis, and collected by.

3.2 Sample Bottles, Preservation, and Holding Time

Table 1 of this appendix identifies the sample preparation and analytical method, matrix, holding time, containers, and preservatives for the typical analyses to be performed at this site as needed.

The selection of sample containers used to collect samples is based on the criteria of sample matrix, analytical method, potential contaminants of concern, reactivity of container material with the sample, quality assurance/quality control (QA/QC) requirements, and any regulatory protocol requirements.

Sample bottles will be provided by the analytical laboratory and will conform to the requirements of the United States Environmental Protection Agency (USEPA) Specifications and Guidance for Contaminant-Free Sample Containers. Soil samples for volatile organic compound (VOC) analysis will be collected in EnCore sample kits. Crayfish may be collected and shipped in either laboratory provided containers or clean, sealed Ziploc® bags.

For the potential analyses anticipated during the site management activities, sample preservation is not needed. Should this change, chemical preservatives will be added to the sample bottles (prior to sample collection) by the analytical laboratory. Sample preservation is checked upon sample receipt by the laboratory.

Holding times (see Table 1) are calculated from the time of sample collection. Samples will be shipped from the field to arrive at the lab no later than 48 hours from the time of sample collection.

3.3 Chain of Custody and Shipping

A chain-of-custody (COC) form, typically provided by the analytical laboratory, will trace the path of sample containers from the project site to the laboratory.

Prior to a sampling event, AECOM personnel will notify the laboratory of upcoming field sampling events and the subsequent transfer of samples. This notification will include information concerning the number and type of samples and the anticipated date of arrival. Insulated sample shipping containers (typically coolers) will be provided by the laboratory for shipping samples. Sample bottles within each shipping container will be individually labeled with an adhesive identification label provided by the laboratory. Project personnel receiving the sample containers from the laboratory will check each cooler for the condition and integrity of the bottles prior to field work.

Once the sample containers are filled, they will be immediately placed in the cooler with ice (in Ziploc® plastic bags to prevent leaking) or synthetic ice packs to maintain the samples at 4^{o}C. The field sampler will indicate the sample designation/location number in the space provided on the COC form for each sample. The COC forms will be signed and placed in a sealed plastic Ziploc® bag in the cooler. The completed shipping container will be closed for transport with nylon strapping, or a similar shipping tape and two custody seals will be affixed to the lid. The seals must be broken to open the cooler and will indicate tampering if the seals are broken before receipt at the laboratory. When the laboratory receives the coolers, the custody seals will be checked, and lab personnel will sign the COC form.

4. DATA QUALITY REQUIREMENTS

4.1 Analytical Methods

Soil and crayfish sample analyses for this project will typically utilize USEPA SW-846 Methods 6010B and 6020A for cadmium, respectively.

Analytical methods used for this project are presented in the NYSDEC Analytical Services Protocol (ASP), 2005. It is the laboratory's responsibility to be familiar with this document and procedures and deliverables within it pertaining to NYS work. Category B deliverables will be required unless specified otherwise in specific work assignments or work plans.

The selected laboratory must be approved by the NYSDEC and certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approved Program (ELAP).

4.2 Quality Assurance Objectives

Data quality objectives (DQOs) for measurement data in terms of sensitivity and the PARCC parameters (precision, accuracy, representativeness, comparability, and completeness) are established so that the data collected are sufficient and of adequate quality for their intended uses. Data collected and analyzed in conformance with the DQO process described in this QAPP will be used in assessing the uncertainty associated with decisions related to this site.

4.2.1 Sensitivity

The sensitivity or detection limit desired for each analysis or compound is based on the DQOs established for the project. The method detection limit is determined in accordance with the procedure in ASP Exhibit A, section 4.9.2.12, which is consistent with the procedure in 40 CFR Part 136 Appendix B.

The Reporting Limit (RL) for non-detected analytes will be the lowest calibration standard associated with the analysis. Reporting limits will be equal to or lower than those presented in Exhibit C of ASP 2005 for the applicable method. Detected analytes at concentrations below the RL but above the MDL will be flagged "J" (estimated) by the laboratory. Typical RLs are summarized on Table 2 of this appendix.

The reporting limits and MDLs of the assigned laboratory will be reviewed by AECOM personnel to verify that the laboratory sensitivity is sufficient to meet the project objectives. These will typically include meeting the applicable standards, criteria, and guidance (SCGs) including soil cleanup objectives (6 NYCRR 375-6.8).

4.2.2 Precision

The laboratory objective for precision is to equal or exceed the precision demonstrated for the applied analytical methods on similar samples. Precision is evaluated by the analyses of laboratory and field duplicates.

Relative Percent Difference (RPD) criteria determined from laboratory performance data are used to evaluate precision between duplicates. A matrix spike duplicate will be performed once for every 20 samples for VOCs.

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value. Precision is usually stated in terms of standard deviation, but other estimates such as the coefficient of variation, relative standard deviation, range (maximum value minus minimum value), and relative range are common and may be used pending review of the data.

The overall precision of measurement data is a mixture of sampling and analytical factors. Analytical precision is easier to control and quantify than sampling precision because there are more historical data related to individual method performance. In contrast, sampling precision is unique to each site or project.

Overall system (sampling plus analytical) precision will be determined by analysis of field duplicate samples for soil samples. Analytical results from laboratory duplicate samples will provide data on measurement (analytical) precision.

Precision will be determined from field duplicates, as well as, matrix spikes and matrix spike duplicates; it will be expressed as the RPD:

$$RPD = 100 \times 2(|X_1 - X_2|) / (X_1 + X_2)$$

where:

X_1 and X_2 are reported concentrations for each duplicate sample and subtracted differences represent absolute values.

Criteria for evaluation of laboratory duplicates are specified in the applicable methods. The objective for field duplicate precision is ≤ 50% RPD for all matrices for analytes detected at concentrations at least 2 times the reporting limit. Where one or both analytes are detected at less than 2 times the RL, the criterion is the absolute difference "D" ($X_1 – X_2$), and D should be less than the RL for the analyte.

4.2.3 Accuracy

The laboratory objective for accuracy is to equal or exceed the accuracy demonstrated for the applied analytical method on similar samples. Percent method recovery criteria and those determined from laboratory performance data are used to evaluate accuracy in matrix (sample) spike and blank spike quality control samples. A matrix spike and blank spike or laboratory control will be performed once for every analytical batch or as specified in the method or ASP. Other method-specific laboratory QC samples (such as continuing calibration standards) may also be used in the assessment of analytical accuracy. Sample (matrix) spike recovery is calculated as:

$$\% \text{ Recovery} = 100 \times (SSR-SR)/SA$$

Where:

SSR = Spiked Sample Result
SR = Sample Result, and
SA = Spike Added

Accuracy measures the bias in a measurement system. It is difficult to measure accuracy for the entire data collection activity; therefore, it will be assessed through use of known QC samples and presented as percent recovery.

Routine organic analytical protocol requires a surrogate spike in each sample. Surrogate recovery will be defined as:

$$\% \text{ Recovery} = (R/S) \times 100$$

Where:

S = surrogate spike concentration
R = reported surrogate compound concentration

Recovery criteria for laboratory spikes and other laboratory QC samples through which accuracy may be evaluated are established in the applicable analytical method.

4.2.4 Representativeness

The representativeness of data is only as good as the representativeness of the samples collected. Sampling and handling procedures and laboratory practices are designed to provide a standard set of performance-driven criteria to provide data of the same quality as other analyses of similar matrices using the same methods under similar conditions. Representativeness will be determined by a comparison of the quality controls for these samples against data from similar samples analyzed at the same time.

4.2.5 Comparability

Comparability of analytical data among laboratories becomes more accurate and reliable when all labs follow the same procedure and share information for program enhancement. Some of these procedures include:

- Instrument standards traceable to National Institute of Standards and Technology (NIST), the USEPA, or the NYSDOH/NYSDEC;
- Using standard methodologies;
- Reporting results for similar matrices in consistent units;
- Applying appropriate levels of quality control within the context of the laboratory quality assurance program; and
- Participation in inter-laboratory studies to document laboratory performance.

By using traceable standards and standard methods, the analytical results can be compared to other labs operating similarly. Periodic laboratory proficiency studies are instituted as a means of monitoring intra-laboratory performance.

Comparability within any specific project is also assessed by comparison of the project data to data generated previously and, if available, comparison of the data for multiple sampling events conducted for the project. Comparability (consistency) of sampling techniques is also assessed, to some extent, by analysis of field duplicates, although it should be noted that large differences between field duplicates may result from a wide variety of causes, not just inconsistent sampling.

4.2.6 Completeness

The goal of completeness is to generate the maximum amount possible of valid data for all planned samples. Completeness of 100 percent indicates that all planned samples were collected and the resultant data were fully valid and acceptable. As completeness is a function of both field activities and laboratory activities, separate completeness goals are established for each.

The default goal for sampling completeness is 95 percent, as is calculated as

$$\text{Sampling Completeness (\%)} = (S_c/S_p) \times 100$$

Where:

S_c = Samples collected (submitted) for analysis (documented from field records or COC)
S_p = Samples planned (as documented in the project-specific work plans)

The default goal for analytical completeness is also set at 95 percent. Analytical completeness may be less than 100 percent either due to systemic failures that result in the rejection or loss of data for an entire sample or compound-specific rejection within an otherwise valid analysis.

For typical work assignments, the default overall completeness goal is 90 percent useable data. The impact of rejected or unusable data will be made on a case-by-case basis. If the goals of the project can be achieved without the missing datum or data, or if data from a different sampling event can be used to fill the data gap, no further action would be necessary. However, loss of critical data may require resampling or reanalysis.

4.3 Field Quality Assurance

Table 2 in this appendix shows typical QA/QC samples and reporting limits. Field QA/QC samples are discussed below.

4.3.1 Blind Field Duplicate Samples

Blind field duplicate samples are used to assess the variability of a matrix at a specific sampling point and to assess the reproducibility of the sampling method. Soil blind duplicate samples are collected from a single location and device (e.g. a split spoon sampler). For the field sampling activities associated with site management activities, blind field duplicates are only anticipated to be collected if soil samples are required for cadmium per the ICs discussed in Section 3 of the SMP. Blind field duplicates will be collected at a frequency of one per 20 samples.

The default field duplicate precision (RPD) objective is ≤50% percent RPD for all matrices where the sample concentration is at least two times the reporting limit. Where the analyte is detected in both samples but the concentration is less than 2 times the reporting limit, precision is assessed by the absolute difference, which should be less than the reporting limit. The RPD is not calculable when the analyte is not detected in one or both analyses. A more detailed discussion of the calculation is provided in Section 4.2.2 (Precision), above.

4.3.2 Temperature Blanks

A temperature blank will be used to measure the temperature of liquid samples. If used, temperature blanks will be supplied by the analytical laboratory. If multiple coolers are necessary to store and transport samples, each cooler will contain an individual temperature blank.

4.4 Laboratory Quality Assurance

4.4.1 Method Blanks

A method blank is laboratory water on which every step of the method is performed and analyzed along with the samples. Method blanks are used to assess the background variability of the method and to assess the introduction of contamination to the samples by the method, technique, or instruments as the sample is prepared and analyzed in the laboratory. Method blanks will be analyzed at a frequency of one for every 20 samples analyzed or as otherwise specified in the analytical protocol.

4.4.2 Spiked Samples

Two types of spiked samples will be prepared and analyzed as quality controls for any soil samples collected for cadmium analysis per the ICs discussed in the SMP: matrix spikes and matrix spike duplicates (MS/MSD), which are analyzed to evaluate instrument and method performance and performance on samples of similar matrix. Additional sample volume will be provided to the laboratory by the project sampling team at a frequency of one for every 20 samples to allow for the MS/MSD analysis. In addition, matrix spike blanks (MSBs) will also be prepared and analyzed by the laboratory as required.

4.4.3 Laboratory Control Sample

A fortified clean matrix (laboratory control sample or LCS) is analyzed with each analysis. In some cases a “Laboratory-Fortified Blank” (LFB) may serve as the LCS. These samples generally consist of a standard aqueous or solid matrix fortified with the analytes of interest for single-analyte methods and selected analytes for multi-analyte methods according to the appropriate analytical method. The LCS may be analyzed in duplicate for some methods (LCSD). The analyte recovery from each analysis (LCS and LCSD) is used to monitor analytical accuracy. Analytical precision can be assessed from evaluation of the LCS/LCSD in the same manner as the MS/MSD.

5. EQUIPMENT CALIBRATION AND MAINTENANCE PROCEDURES

Quality assurance for instrumentation and equipment used for a project is controlled by a formal calibration program, which verifies that equipment is of the proper type, range, accuracy, and precision to provide data compatible with specified requirements. Instruments and equipment that measure a quantity or performance expected at a stated level are subject to calibration. Calibration is performed using reference standards or externally by calibration agencies or equipment manufacturers.

5.1 Laboratory Equipment Calibration

Laboratory equipment will be calibrated according to the method-specific requirements of the 2005 NYSDEC ASP, Exhibit E, Parts II and III and maintained following professional judgment and the manufacturer's specifications and additional requirements as specified in the ELAP certification manual.

5.1.1 Calibration Procedure

Written procedures are used for all instruments and equipment subject to calibration. For chemical analyses potentially performed for the site management activities, the calibration procedures are specified in the methods as compiled in the ASP. If established procedures are not available, a procedure is developed considering the type of equipment, stability characteristics of the equipment, required accuracy, and the effect of operational error on the quantities measured.

5.1.2 Calibration Frequency

Calibration frequency is based on the type of equipment, inherent stability, manufacturer's recommendations, values provided in recognized standards, intended data use, specified analytical methods, effect of error upon the measurement process, and prior experience.

5.1.3 Calibration Reference Standards

Two types of reference standards will be used by the laboratory for calibration, including:

- Physical standards, such as weights for calibrating balances and certified thermometers for calibrating working thermometers, refrigerators and ovens, are generally used for periodic calibration; and

- Chemical standards, such as Standard Reference Materials (SRMs) provided by the NIST or USEPA, may also include vendor-certified materials traceable to NIST or USEPA SRMs. These are primarily used for operational calibration.

5.1.4 Calibration Failure

Equipment that cannot be calibrated or becomes inoperable is removed from service. Such equipment must be repaired and satisfactorily recalibrated before re-use. For laboratory equipment that fails calibration, analysis cannot proceed until appropriate corrective action is taken and the analyst achieves an acceptable calibration.

Laboratory managers are responsible for development and implementation of a contingency plan for major equipment failure. The plan includes guidelines on waiting for repairs, use of other instrumentation, subcontracting analyses, and evaluating scheduled priorities.

5.1.5 Calibration Records

Records are prepared and maintained for each piece of equipment subject to calibration. Records demonstrating accuracy of preparation, stability, and proof of continuity of reference standards are also maintained. Copies of the raw calibration data are kept with the analytical sample data.

5.2 Operational Calibration

Operational calibration is generally performed as part of the analytical procedure and refers to those operations in which instrument response (in its broadest interpretation) is related to analyte concentration. Included are the preparation of a standard response (calibration) curve and often the analysis of blanks.

Preparation of a standard calibration curve is accomplished by the analysis of calibration standards, which are prepared by adding the analyte(s) of interest to the solvent that is introduced into the instrument. The concentrations of the calibration standards are chosen to cover the working range of the instrument or method. For most methods, five calibration standards are used, with the concentration of the lowest calibration standard being the reporting or quantitation limit for that analysis. Sample measurements are made and reported within this working range. Apparent concentrations which exceed the high end of the calibrated range ("E"-flagged data for organic analyses) are diluted (or a smaller sample is used) and re-analyzed. The calibration curve is prepared by plotting or performing a linear regression of the instrument responses against the analyte concentration.

6. DATA REDUCTION, VALIDATION, AND REPORTING

The guidance followed to perform quality data validation, and the methods and procedures outlined herein and elsewhere in the SMP and its attachments pertain to initiating and performing data validation, as well as reviewing data validation performed by others (if applicable). An outline of the data validation process is presented here, followed by a description of data validation review summaries.

6.1 Laboratory Data Reporting and Reduction

Data reduction is the process by which raw analytical data generated from laboratory instrument systems is converted into usable concentrations. The raw data, which may take the form of area counts, instrument responses, or observations, are processed by the laboratory and converted into concentrations expressed in the parts per million (mg/kg or mg/L) or parts per billion (µg/kg or µg/L) range. Raw data from these systems include compound identifications, concentrations, retention times, and data system print-outs. Raw data are usually reported in graphic form, bar graph form, or tabular form. The laboratory will follow standard operating procedures consistent with the data handling requirements of the applicable methods.

The laboratory will meet the applicable documentation, data reduction, and reporting protocols as specified in the 2005 revision of the NYSDEC ASP. ASP Deliverables are either Category B (full deliverables; similar to USEPA CLP requirements) or Category A (a reduced deliverable level). For the site management activities, Category B deliverables are the default and will be provided for all deliverables generated for the project unless explicitly indicated otherwise.

To meet NYSDEC electronic data deliverable (EDD) requirements, the contracted laboratory for this work will be required to submit electronic deliverables in an EQuIS 4-file format. AECOM personnel will be responsible for submitting a final EQuIS deliverable to NYSDEC that meets NYSDEC EDD requirements.

In addition to the hard copy of the data report, the laboratory will be asked to provide the sample data in spreadsheet form (submitted electronically or on computer diskette). The data spreadsheet will be generated to the extent possible directly from the laboratory's electronic files or information management system to minimize possible transcription errors resulting from the manual transcription of data.

6.2 Data Validation

Data generated for this site will be validated by a third-party subcontractor (not affiliated with the laboratory, AECOM, or Lockheed Martin). The validator will follow guidelines established in the USEPA Region 2 SOPs applicable to the analytical method(s) being reviewed. These SOPs are checklists which are designed to formally and rigorously assess the quality and completeness of SW-846 analysis data packages. The use of these USEPA SOPs will be adapted to conform to the specific requirements of the NYSDEC ASP (e.g., NYSDEC/ASP holding times; matrix spike blank requirements). Where necessary and appropriate, supplemental validation criteria may be derived from the EPA Functional Guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA-540-R-10-011, January 2010, and the National Functional Guidelines for Organic Data Review, EPA-540-R-08-01, June 2008).

Data Usability Summary Reports (DUSRs) will consist of text results of the review. Validation will consist of target and non-target compounds with corresponding method blank data, spike and surrogate recoveries, sample data, and a final note of validation decision or qualification, along with any pertinent footnote references. Qualifiers applied to the data will be documented in the report text. Where QC failures caused the laboratory to perform a re-analysis, the data validator will make a recommendation as to which of the two analyses should be used. Data review will also include an assessment of sensitivity (i.e., are reporting limits appropriate to determine if contaminants are present at or above action levels or other applicable threshold values).

There may be some analyses for which there is no established USEPA or NYSDEC data validation protocol. In such cases, validation will be based on the Region 2 SOPs and EPA Functional Guidelines as much as possible, as well as the laboratory's adherence to the technical requirements of the method, and the professional judgment of the validator. The degree of rigor in such validation will correspond to the nature of the data and the significance of the data and its intended use.

6.3 Field Data Verification

Verification of field data will be performed at two different levels. The first level of data verification will be performed at the time of collection by following standard procedures and QC checks. The second level of review consists of the Project Manager, or other competent personnel, reviewing the data to confirm that the correct values and units have been included. After data reduction into tables is complete, the Project Manager will review field reports for reasonableness and completeness and will validate subjective field and technical data.

7. PERFORMANCE AND SYSTEM AUDITS

Audits are systematic checks to determine the quality of operation of some activity or function in the field or laboratory. Two types of field audits may be conducted to verify adherence to proper field and sampling procedures:

- Performance audits are independent safety and health, procedure, and/or sample checks made by a supervisor or auditor to arrive at a quantitative measure of the quality of the data produced by one section or the entire measurement process; and

- System audits are onsite qualitative inspections and reviews of the QA system used by some part of or the entire measurement system. The audits are performed against the QAPP. A checklist is typically generated from the requirements and becomes the basis for the audit. The results of any deficiencies noted during the audit are summarized in an audit report.

Laboratory performance and system audits are performed by the laboratory's QA staff to assess the effectiveness of the quality system. These internal audits are performed on a routine basis. Audits are

also performed by certifying agencies. Audit reports and corrective actions are available to NYSDEC for review.

7.1 Laboratory Performance and System Audits

The laboratory selected for this project has been verified to be certified by the NYSDOH Environmental Laboratory Approval Program for the matrices and analytical protocols to be used. Therefore, no project-specific audit of the laboratory(s) will be performed unless warranted by a problem(s) that cannot be resolved by any other means, or at the discretion of AECOM.

7.2 Audit Procedures

Prior to an audit, the designated lead auditor will prepare an audit checklist. During an audit and upon its completion, the auditor(s) will discuss the findings with the individuals audited and discuss and agree on corrective actions to be initiated. The auditor will then prepare and submit an audit report to the manager of the audited group and the project manager.

The manager of the audited group will then prepare and submit, to the Project Manager, a plan for implementing the corrective action to be taken on non-conformances indicated in the audit report, the date by which such corrective action will be completed, and actions taken to prevent reoccurrence. If the corrective action has been completed, supporting documentation should be attached to the reply. The auditor will ascertain (by re-audit or other means) if appropriate and timely corrective action has been implemented.

Records of audits will be maintained in the project files.

7.3 Audit Documentation

A checklist will be completed during each audit so that the previously defined scope of the individual audits is accomplished and that the audits follow established procedures. The checklist will detail the activities to be executed as part of the auditing plan. Audit checklists will be prepared in advance and will be available for review. Following each system and performance audit, the auditor will prepare a report to document the findings of the specific audit.

8. CORRECTIVE ACTIONS

If instrument performance or data fall outside acceptable limits, corrective actions will be taken. These actions may include recalibration or standardization of instruments, acquiring new standards, replacing equipment, repairing equipment, and reanalyzing samples or redoing sections of work.

Situations related to the site management activities requiring corrective action will be documented and made part of the project file. For each measurement system identified requiring corrective action, the responsible individual for initiating the corrective action, and also the individual responsible for approving the corrective action, if necessary, will be identified.

As part of its quality management system (QMS) program, AECOM provides relevant excerpts and conclusions from data validation reports to the analytical laboratories. The laboratories are therefore made aware of non-critical items and areas where improvement may be made in subsequent project-related work.

The objectives of the corrective action procedures presented below are to ensure that recognized errors in performance of sample and data acquisition lead to effective remedial measures and that those steps are documented to provide assurance that any data quality deficiencies are recognized in later interpretation and are not recurrent.

8.1 Rationale

Many times corrective measures are undertaken in a timely and effective fashion but go undocumented. In other cases, corrective actions are of a complex nature and may require scheduled interactions between departmental groups. In either case, documentation in a formal or informal sense can reinforce the effectiveness and duration of the corrective measures taken.

8.2 Corrective Action Methods

8.2.1 Immediate Corrective Actions

Immediate corrective actions are of a minor or routine nature such as correcting malfunctioning equipment, correction of data transcription errors, and other such activities routinely made in the field, laboratory, or office by technicians, analysts, and other project staff.

8.2.2 Long-Term Corrective Actions

Long-term corrective action will be used to identify and eliminate causes of non-conformances which are of a complex nature and that are formally reported between management groups.

8.2.3 Corrective Action Steps

For long-term corrective actions, steps comprising closed-loop corrective action system are as follows:

- Define the problem;
- Assign responsibility for investigating the problem;
- Investigate and determine the cause of the problem;
- Determine a corrective action to eliminate the problem;
- Assign and accept responsibility for implementing the corrective action; and
- Verify that the corrective action has eliminated the problem.

Non-conformance events associated with analytical work are documented by the laboratories' Non-Conformance Records, which are reviewed and approved by the laboratory's Quality Assurance Manager.

8.2.4 Audit-Based Non-Conformances

Following audits, corrective actions are initiated if required by documenting the audit finding and recommended corrective action on an Audit Finding Report.

8.3 Corrective Action Report Review and Filing

Immediate and long-term corrective actions require review to assure that during the time of non-conformance, erroneous data were not generated or that, if possible, correct data were acquired instead. Such confirmation and review is the responsibility of the supervisor of the staff implementing the corrective action. Confirmation will be acknowledged by notation and dated signature on the affected data record or appropriate form or by memorandum to AECOM project management.

9. REFERENCES

NYSDEC, 2010a. *Technical Guidance for Site Investigation and Remediation. Draft. DER-10*. Division of Environmental Remediation. December.

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USEPA Region 2, Standard Operating Procedures for Data Review. Available at http://www.epa.gov/region02/qa/documents.htm#sop.

USEPA, 1986. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third edition. EPA SW-846. With revisions and updates through March, 2009. Accessed on line (at "SW-846 On-Line") at http://www.epa.gov/epaoswer/hazwaste/test/main.htm

USEPA, 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. USEPA Office of Emergency and Remedial Response. OSWER Directive No. 355.3-01. October.

USEPA, 2010. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540/R-10-011. January.

USEPA, 2008. Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA/540/R-08-01. June.

Table 1. Sample Bottle, Volume, Preservation, and Holding Time Summary

MATRIX/ANALYSIS	Sample Prep Method [1]	Analytical Method [(2)]	Sample Bottles (3)				Minimum	Preservation	Holding Time (4, 5)		Comment
			Mat'l	Size	Qty	Source	Vol Rqd	(4)	Extraction	Analysis	
Soil Samples											
Volatile Organics	SW 846 5035	SW 846 8260B	Encore	5 or 25 g	3 or 1	Vendor [7]	5 g	None	NA	48 hours [8]	
Semivolatile Organics	SW 846 3540C/3541/3545C	SW 846 8270C	G	8 oz [(6)]	1	Lab	30 g	None	14 days	40 days	
Pesticides	SW 846 3540C/3541/3545C	SW 846 8081A	G	8 oz [(6)]	1	Lab	30 g	None	14 days	40 days	
PCBs	SW 846 3540C/3541/3545C	SW 846 8082	G	8 oz [(6)]	1	Lab	30 g	None	14 days	40 days	
Metals (except mercury)	SW 846 3050B/3051/3052	SW 846 6010B	G	8 oz [(6)]	1	Lab	10 g	None	NA	180 days	180 days for TAL metals except Hg.
Mercury	SW 846 7471A	SW 846 7471A	G	8 oz [(6)]	1	Lab	2 g	None	NA	28 days	28 days for Hg.
Biological Samples											
Cadmium	SW 846 3050B	SW 846 6020A	G or Ziploc®	NA	1	NA	20 g	-20 ° C during lab storage	NA	180 days	

(1) Laboratory may propose alternate extraction/preparation methods, subject to AECOM approval.
(2) More recent versions of SW-846 methods may be used subject to AECOM approval.
(3) EnCore samplers for VOCs in soil will be provided by laboratory or AECOM on a case-by-case basis.
(4) All samples for chemical analysis should be held at 4 degrees C in addition to any chemical preservation required.
(5) Holding time calculated from day of collection, unless noted as being from time of extraction. Laboratory holding times (ASP 2005, Exhibit I) are two days shorter to allow for field handling and shipping.
(6) A single 8-oz sample is sufficient for SVOCs, pesticides, PCBs, and metals.
(7) Encore samplers are typically purchased from an outside supplier by AECOM but may also be requested (for a fee) from the analytical laboratory.
(8) Encore samplers must be prepared/preserved in the laboratory within 48 hours of collection. Soil samples in glass bottles and preserved Encores have a 14 day (total) holding time.

G = Glass
SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. USEPA SW-846. Complete through Update IV, March 2009.
EPA = Compendium of Methods for the Determination of Toxic Organics in Air, Second Edition (EPA/625/R-96/010b; 1999)

Table 2. Reporting Limits and QA/QC Sample Quantity Summary

MATRIX/ANALYSIS	Analytical Method	Laboratory	Reporting Limit -Typical (units as specified) [1]	Field Sample Quantity	Matrix Spike (MS) or LCS [2]	MS Duplicate or Matrix Duplicate [2]	Field Duplicate [2]	Equipment Blank	Trip Blank	Total Billable Analyses
Soil Samples										
Volatile organics	SW 846 8260B	TBD	5 µg/kg (typical)	TBD	TBD	TBD	TBD	NA	NA	TBD
Semivolatile organics	SW 846 8270C	TBD	330 µg/kg (typical)	TBD	TBD	TBD	TBD	NA	NA	TBD
Pesticides	SW 846 8081A	TBD	1.7-3.3 µg/kg (typical)	TBD	TBD	TBD	TBD	NA	NA	TBD
PCBs	SW 846 8082	TBD	57 - 70 µg/kg	TBD	TBD	TBD	TBD	NA	NA	TBD
Metals (TAL except Hg)	SW 846 6010B	TBD	Analyte-specific	TBD	TBD	TBD	TBD	NA	NA	TBD
Mercury	SW 846 7471A	TBD	0.2 µg/kg	TBD	TBD	TBD	TBD	NA	NA	TBD
Biological Samples										
Cadmium	SW 846 6020A	TBD	0.1 mg/kg	15 per event	NA	NA	NA	NA	NA	15 per event

TAL = Target Analyte List (23 Metals)
TBD = To be determined.
NA-Not anticipated to be required during site management activities.

Notes
1 Reporting limits for soils, when adjusted for dry weight, will be higher. Detections above the MDL but less than reporting limits will be reported and flagged estimated (J).
2 Matrix spike, matrix spike duplicates, and field duplicates will be collected at a frequency of 1 per 20 samples.

APPENDIX H

Health and Safety Plan

BLOODY BROOK

ONONDAGA COUNTY

LIVERPOOL, NEW YORK

Site Management Health and Safety Plan

Prepared for:

Lockheed Martin Corporation
497 Electronics Parkway
Building EP-6, Room 100B
Liverpool, New York 13088

Prepared by:

AECOM
5015 Campuswood Drive, Suite 104
E. Syracuse, NY 13057

Project Health and Safety Plan

This project Site Management Health and Safety Plan (SM HASP) was prepared for employees performing a specific, limited scope of work. It was prepared based on the best available information regarding the physical and chemical hazards known or suspected to be present on the project site. While it is not possible to discover, evaluate, and protect in advance against all possible hazards which may be encountered during the completion of this project, adherence to the requirements of the SM HASP will significantly reduce the potential for occupational injury.

By signing below, I acknowledge that I have reviewed and hereby approve the SM HASP for the Bloody Brook site. This SM HASP has been written for the exclusive use of AECOM, its employees, and subcontractors. The plan is written for specified site conditions, dates, and personnel, and must be amended if these conditions change.

Approvals:

Nickcole M. Evans

9/13/17

Nickcole M. Evans, P.E.
Project Manager
315-243-1624

Date

Peter Gregory

9/13/17

Peter Gregory
Northeast Regional Health and Safety Manager
201-602-3511

Date

Executive Summary

The purpose of this Site Management Health and Safety Plan (SM HASP) is to address health and safety concerns related to AECOM managed activities at the Bloody Brook site located in Liverpool, New York. The specific roles, responsibilities, authority, and requirements as they pertain to the safety of employees and the anticipated scope of services are discussed herein. The document is intended to identify known potential hazards and facilitate communication and control measures to prevent injury or harm. Additionally, provisions to control the potential for environmental impact from these activities are included where applicable.

<table>
<tr><td colspan="6">SUMMARY TABLE</td></tr>
<tr><td colspan="2">AECOM Scope of Work</td><td colspan="4">• Site walks and inspections for erosion and vegetation
• Potential installation of erosion controls
• Potential erosion repairs (e.g., removing and replacing riprap (light stone fill), topsoil replacement, etc.)
• Sampling crayfish from the brook
• Work in the wetland area (e.g., removal of Phragmites, inspecting and planting shrubs and trees, etc.)
• Potential excavation, staging, and disposal of contaminated soils
• Potential soil sampling with hand augers and/or track mounted Geoprobe®</td></tr>
<tr><td colspan="6">PRIMARY PHYSICAL HAZARDS</td></tr>
<tr><td>X</td><td>Underground Utilities</td><td>X</td><td>Traffic Control</td><td>X</td><td>Electrical Hazards</td></tr>
<tr><td>X</td><td>Overhead Utilities</td><td>X</td><td>Slips, Trips/Walking Surface</td><td>X</td><td>Excavation & Trenching</td></tr>
<tr><td></td><td></td><td>X</td><td>Manual Lifting</td><td></td><td></td></tr>
<tr><td colspan="6">CHEMCIAL HAZARDS, MONITORING, ACTION LEVELS</td></tr>
<tr><td colspan="2">COC</td><td colspan="2">MONITORING</td><td colspan="2">ACTION LEVELS</td></tr>
<tr><td colspan="2">Cadmium</td><td colspan="2">Personal Monitoring, not anticipated to be required</td><td colspan="2">OSHA Action Level and PEL</td></tr>
</table>

All staff is bound by the provisions of this SM HASP and are required to participate in a preliminary project safety meeting to familiarize them with the anticipated hazards and respective onsite controls. The discussion will cover the entire SM HASP subject matter, putting emphasis on critical elements of the plan such as the emergency response procedures; personal protective equipment; site control strategies; and monitoring requirements. In addition, daily tailgate safety meetings will be held to discuss the anticipated scope of work; required controls; identification of new hazards and controls; incident reporting; review the results of inspections; and any lessons learned or concerns from the previous day.

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ATTACHMENTS

1 INTRODUCTION

This Site Management Health and Safety Plan (SM HASP) applies to remedial action activities conducted at the Bloody Brook site, located in Onondaga County, NY ("site"). AECOM is the engineer of record for this project and will be implementing the site management for Lockheed Martin Corporation (Lockheed Martin). This document establishes general health and safety requirements and procedures for the protection of AECOM personnel and to prevent and minimize personal injuries, illnesses, and physical damage to equipment, supplies, and property.

SM HASP Supplements will be generated as necessary to address any additional activities or changes in site conditions which may occur during site management and field operations.

1.1 General

The provisions of this SM HASP are mandatory for all AECOM personnel engaged in fieldwork associated with the environmental services being conducted at the site. A copy of this SM HASP, any applicable SM HASP Supplements, and the AECOM North America Safety, Health, and Environmental (SH&E) Procedures shall be accessible and available for review at all times. Record keeping will be maintained in accordance with this SM HASP and the applicable Standard Operating Procedures (SOPs). In the event of a conflict between this SM HASP, the SOPs, and federal, provincial, state, and local regulations, workers shall follow the most stringent/protective requirements. Concurrence with the provisions of this SM HASP is mandatory for all personnel at the site covered by this SM HASP and must be signed on the acknowledgement page.

1.2 Project safety

AECOM is committed to protecting the safety and health of our employees and meeting our obligations with respect to the protection of others affected by our activities. We are also committed to protecting and preserving the natural environment in which we operate. The safety of persons and property is of vital importance to the success of this project, and accident prevention measures shall be taken toward the avoidance of needless waste and loss. It shall be the policy of this project that all operations be conducted safely. Onsite supervisors are responsible for those they supervise by maintaining a safe and healthy working environment in their areas of responsibility, and by fairly and uniformly enforcing safety and health rules and requirements for all project personnel. Subcontractors shall comply with the requirements of this SM HASP, provisions contained within the contract document and all applicable rules, requirements and health, safety and environmental regulations. All practical measures shall be taken to promote safety and maintain a safe place to work. Contractors are wholly responsible for the prevention of accidents on work under their direction and shall be responsible for thorough safety and loss control programs and the execution of their own safety plans for the protection of workers.

Site staff and managers conducting site visits will be encouraged to report near miss events and safety observations.

1.3 Change Management

If deviations are encountered from the anticipated site management activities and field sampling plan included in the Site Management Plan (SMP), the AECOM shall A) notify to the Lockheed Martin Project Lead and B) suspend work to assess changes to the work plan(s) and the SM HASP. Changes to the SMP and the SM HASP shall be reviewed by the Lockheed Martin Project Lead (PL).

2 SITE INFORMATION AND SCOPE OF WORK

AECOM conducted environmental remediation construction services to remove elevated levels of cadmium detected in soil and sediment at the Bloody Brook site between 2014 and 2017. After completion of the remedial work, some contamination was left at the site, requiring that post-remedial site management activities be initiated to ensure the remedy continues to be protective as designed and constructed. The required site management activities are provided in the SMP.

The following is a summary of relevant data concerning the project site and the work procedures to be performed. Additional details regarding this work are provided in the SMP. Changes to the planned site management activities may require that a Safety Professional review them as well as any changes made to this SM HASP to ensure adequate protection of personnel and other property.

2.1 Site Information

This section provides a general description and historical information associated with the site.

2.1.1 General Information

The "site" is defined as West Branch of Bloody Brook (WBBB) and Bloody Brook and the surrounding area commencing on the southern boundary of the New York State Thruway (Thruway) and ending at Onondaga Lake Parkway.[1]

Access to the work areas for ingress and egress of personnel and equipment, if needed, will be from public roadways, public property, and private properties. Annual site inspections, as detailed in the SMP, will typically be completed from the Bloody Brook Drainage District (Drainage District). The public roadway access points include Brookview Lane, Sunflower Drive, Floradale Road, Pearl Street, Old Liverpool Road, and Onondaga Lake Parkway. The Drainage District and individually owned private property will also be used to access the site. Access from private properties will be arranged with the appropriate parties prior to commencing work.

[1] The term "site" in the VCA is defined as: a portion of the banks, surface waters and sediments of the West and Middle Branches of Bloody Brook located in the Town of Salina, which commences downstream of Interstate 90, the New York State Thruway, and which extends generally southward past the confluence of the West Branch and the Middle Branch of Bloody Brook, and ends on the upstream side of Onondaga Lake Parkway. After examining data developed during remedial investigation work in the Middle Branch, NYSDEC determined that no further action was required for that branch of Bloody Brook. For this reason, the "site" in this document relates only to those areas within the site where the remedial program was implemented and remedial action was performed.

Figure 2-1: Site Location Map

2.2 Scope of Work

AECOM will be performing activities related to site management following remedial activities completed at the site between 2014 and 2017. Planned and potential activities related to site management and covered in this HASP include:

- Site walks and inspections for erosion and vegetation;
- Potential installation of erosion controls;
- Potential erosion repairs (e.g., removing and replacing riprap (light stone fill), topsoil replacement, etc.);
- Sampling crayfish from the brook;
- Work in the wetland area (e.g., removal of Phragmites, inspecting and planting shrubs and trees, etc.);
- Potential excavation, staging, and disposal of contaminated soils;
- Potential soil sampling with hand augers and/or track mounted Geoprobe®;

If soil sampling or excavation occurs, the Community Air Monitoring Plan (CAMP) included in the Field Sampling Plan (FSP) will be implemented. The FSP is included as an appendix to the SMP.

2.2.1 Ground Intrusive Activities

Site preparation for ground intrusive activities will always include utility mark-out and clearance prior to initiating the work. For site management activities, other required site preparation will be handled as needed on a case by case basis in accordance with the SMP. If utility locations cannot be verified on-site by the public authority, then a private utility location contractor may need to be utilized to confirm/deny the presence of private underground utilities on the site. Typically, lead time is three days and the permits generally valid for 30 days.

Details related to specific ground intrusive activities will be summarized and provided in Pre-Job Safety Assessments (JSAs) and Task Hazard Assessments (THAs), to be discussed and completed prior to the initiation of any ground intrusive activity. If potential hazards related to a specific activity are not included in this HASP, the HASP must be updated prior to initiating the task. JSA/THAs will be maintained in a separate binder available for review on the project site.

3 HAZARD ASSESSMENT (SAFETY)

3.1 Physical Hazards

The following physical hazards are anticipated to be present on the site. Additional hazards may be noted on the JSA's developed for the individual tasks. Task specific hazard analysis using JSAs will be prepared by project staff prior to initiation of the specific tasks, and completed JSAs will be maintained in a separate binder available for review on the project site.

3.1.1 Electrical Hazards

Electrical and powered equipment may be used during a variety of site activities. Injuries associated with electrical and powered equipment include electric shock and fire. To reduce the potential of injury from the hazards associated with electrical and powered equipment, always comply with the following:

- Inspect all electrical tools and extension cords prior to use. Do not use defective tools or cords.
- Use ground fault circuit interrupters (GFCIs) when using electrical powered tools/equipment. GFCIs prevent electrical shock by detecting the loss of electricity from a power cord and/or electrical device.
- Cordless power tools should be used in place of power tools requiring a cord.
- Ensure generators are properly grounded, including the use of a grounding rod driven to a depth of 3 feet.
- Extension cords shall be rated for heavy outdoor use and protected from damage.

AECOM employees are not authorized to make electrical repairs.

3.1.2 Excavation and Trenching

The principle hazards associated with excavation and trench activities are striking buried utilities, being struck by material being handled, and engulfment from soil caving in. In addition, excavations and trenches constructed in a hazardous area such as near a gasoline station, landfill, or hazardous waste site may be classified as permit required confined space because there is a potential that the atmosphere may contain hazardous gases or vapors, or be oxygen deficient.

Personnel shall maintain at least a 3 foot distance from the edge of the excavation. Additional information on excavation and trenching can be found in SOP S3AM-303-PR (Excavation and Trenching).

In accordance with OSHA, the contractor is responsible for an onsite competent person to conduct daily, or more frequent, inspections of each trench or excavation, the adjacent hazards and protective systems for evidence of possible cave-in/failure of protective systems, hazardous atmosphere, and other hazardous condition and determine the necessary precautions to take.

AECOM employees should not enter an excavation or trench if they feel that entry is unsafe or does not meet the requirements presented below:

- Prior to digging, call Dig Safely, NY at 811 or 1.800.962.7962. All underground utilities in the work area must be positively identified by calling 811. Markings made during the utility investigation must be maintained throughout the course of work.
- When personnel are required to enter a trench or excavation over 4 feet deep, an adequate means of exit, such as a ladder, steps, or ramp must be provided and located so as to require no more than 25 feet of lateral travel. Ladders will extend at least 3 feet above the edge of the trench and will be securely staked in place.
- Walkways or bridges with standard railings and toe board must be provided when personnel or equipment are required to cross over excavations.
- The walls and faces of excavations in which personnel are exposed to danger from moving ground must be guarded by a shoring system, sloping of the ground, or some other equivalent means as required by 29 CFR 1926 Subpart P.
- No person shall be permitted under loads handled by excavators or other material handling equipment.
- The spoils pile shall be placed at one side of the excavation. At a minimum, the toe of the spoil pile shall be at least 2 feet away from the edge of the excavation. The spoils pile shall be moved farther back in proportion to the depth of the excavation. The spoils pile height shall not exceed the depth of the excavation and shall be sloped to prevent the soil and rocks from sliding into the excavation.
- Protective system(s) to prevent cave-in shall be used when personnel enter excavations 5 feet or greater in depth or if the competent person determines it is necessary at shallower depths. Protective system(s) shall be compliant with the requirements of 29 CFR 1926 Subpart P. A Registered Professional Engineer must design protective systems for excavations/trenches 20 feet or greater in depth.
- Where protective systems are used such as trench boxes, hydraulic shoring, etc., they shall be used in accordance with the manufacturer's specifications and limitations. The manufacturer's tabulated data for such systems must be maintained on the project.
- AECOM employees shall not enter an excavation in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.
- Excavation or trenches that pose an atmospheric hazard must be tested for oxygen content, explosive gases/vapors and toxic gases/vapors (i.e. carbon monoxide, hydrogen sulfide, contaminants of concern) prior to and during entry.

3.1.3 Falls

3.1.3.1 Same Level

Falls from slips and trips are common workplace occurrences that can result in serious injuries and disabilities. The most common type of falls is falls at the same level. Fall hazards can exist in most workplaces including offices, manufacturing and construction. Slips and trips can be prevented by following these guidelines:

- Personnel shall be vigilant in providing clear footing, clearly identifying obstructions, holes, protruding objects or other tripping hazards and maintaining an awareness of uneven terrain and slippery surfaces.
- Walking and working surfaces shall be kept free of materials, obstructions, and substances that could cause a surface to become slick or otherwise hazardous.
- Always utilize roads, pathways, or other designated routes or travel. Do not take shortcuts.
- Makeshift substitute ladders such as toolboxes, buckets, and coolers shall not be used.
- The use of cellular telephones (testing, making or receiving calls) for personal use is prohibited in the work area.
- Walk around, not over or on, debris or equipment that might have been stored in the work area.
- Don’t jump from platforms or truck beds.
- Don’t climb on stock piles or trucks

- When carrying equipment, identify a path that is clear of any obstructions. It might be necessary to remove obstacles to create a smooth, unobstructed access point to the work areas on site.

3.1.3.2 Elevated Surfaces

Falls from elevations greater than 6 feet above a lower level or less than 6 feet above dangerous equipment can result in serious injury and even death. To prevent falls from elevations, the walking and working surface must be surrounded on all open sides by standard railings or their equivalent (fence, barricade, or cover), or by employees who are protected by a personal fall arrest. Fall protection shall comply with 29 CFR 1926 Subpart M. Specific requirements for fall protection can be found in SOP S3AM-304-PR (Fall Protection). To use a personal fall arrest system employees must be trained in their use, limitations, and care of the system. A personal fall arrest system consists of the following:

- Anchor point capable of supporting 5000 pounds,
- Full body harness meeting ANSI requirements,
- Shock absorbing lanyard meeting ANSI requirements that limit free fall distance to six feet, or
- Self –retracting lanyard that meets ANSI requirements for limiting the free fall distance to two feet.

A standard railing or equivalent must be provided around openings at or greater than 6 feet above a lower level or less than 6-feet above dangerous equipment. In addition, excavation 6 feet or more in depth not readily seen must have a standard railing or equivalent around openings. Employee at the edge of a well, pit, shaft, and similar excavation 6 feet or more in depth must be protected from falling by standard railing or equivalent.
Falls from elevations can be prevented by following these guidelines:

- Where an employee observes that a fall hazard exits in the workplace that is not protected by a standard rail the employee shall promptly notify the responsible party. Employees must avoid the area until the responsible party has taken the necessary corrective actions,
- Stay away (at least 15 feet) from unprotected opening,
- Do not lean on or climb on a standard railing or equivalent,
- Avoid walking on floor hole covers and do not remove floor hole cover, and
- Where a standard railing is not provided or when removed employee must use a personal fall arrest system.

3.1.4 Heavy Equipment and Vehicle Operations

Heavy equipment and site vehicles present serious hazards site personnel. Blind spots, failure to yield, and other situations may cause heavy equipment/vehicles to come into contact with personnel. To reduce the possibility of contact between equipment/traffic and personnel, always adhere to the following:

- Personnel must wear a high visibility, reflective safety vest at all times when working near heavy equipment and/or other vehicle traffic,
- Personnel must always yield to equipment/vehicle traffic and stay as far as possible from all equipment/vehicle traffic. Always maintain eye contact with operators,
- When feasible, place barriers between work areas and equipment/vehicle traffic,
- Always ensure reverse warning alarms are working and louder than surrounding noise. Personnel must report inoperative reverse warning alarms, and
- Ensure Daily Equipment Safety Inspections are being performed and documentation filed at the site.

For additional requirements, refer to SOP S3AM-309-PR (Mobile or Heavy Equipment).

3.1.5 Fire Prevention

AECOM shall establish fire prevention and protection techniques in accordance with 29 CFR 1926 Subpart F as needed, determined prior to the initiation of a work activity. At a minimum:

- Company vehicles will be equipped with a fire extinguisher. Fire extinguishers will be inspected monthly and serviced yearly;
- A mobile phone will be carried by personnel on the site so that the local fire department can be alerted for an emergency;
- Smoking is prohibited at the project site; and
- Igniting or maintaining an open fire at the project site is prohibited,

3.1.6 Noise

The use of construction equipment can expose the field team to noise levels that exceed the OSHA PEL of 90 dB for an 8-hour day. Exposure to noise can result in the following:

- Temporary hearing losses where normal hearing returns after a rest period,
- Interference with speech communication and the perception of auditory signals,
- Interference with the performance of complicated tasks, and,
- Permanent hearing loss due to repeated exposure resulting in nerve destruction in the hearing organ.

Since personal noise monitoring will not be conducted during the proposed activities, employees must follow this general rule of thumb: If the noise levels are such that you must shout at someone two (2) feet away from you, you need to be wearing hearing protection. Employees can wear either disposable earplugs or earmuffs but all hearing protection must have a minimum noise reduction rating (NRR) of 27 dB.

3.1.7 Hand and Power Tools

Hazards associated with hand tools are cuts, lacerations, electrocution, and struck by flying objects. Frequent and prolonged use of hand tools can cause soreness, aches, pains, and fatigue, which, when ignored, can lead to chronic musculoskeletal injuries (MSIs).

Many injuries have been caused by the use of fixed open blade knives such as a jack knife or box cutter. Cutting tools that can be used by AECOM employees for cutting include shears, snips, tubing cutters, ratchet type pipe cutters, side cutters, and retractable blade utility knife or concealed blade knife. The use of fixed opened blade knives is prohibited.

Basic safety rules can help prevent hazards associated with the use of hand tools:

- Use the right tool for particular work activity being conducted (e.g., don't use a file or a screwdriver as a pry bar),
- Examine each tool for damage before use (e.g., worn, splintered handles, etc.) and do not use damaged tools,
- Use properly the right personal protective equipment (e.g., eye protection, gloves, hearing protectors),
- Hold work in a clamp or vise, not in your hand,
- Position your body securely while working with the tool,
- Plastic covered tool handles are for comfort only, not protection from electrical current,
- When working with a wrench, always pull the wrench, never push the wrench,
- Hand sockets should never be used on power or impact wrenches. Hand sockets usually have bright finish but may have black finish,
- Discard any chisel or punch that is chipped or mushroomed,
- Don't use a screwdriver for prying, punching, chiseling, scoring or scraping. Screwdrivers should only be used to drive or remove screws, and
- Never use an extension bar such as a length of pipe to increase leverage on a wrench. This could result in breakage of the wrench and personal injury.

3.1.7.1 Power Tools

- Inspect power tools before use. Do not use defective power tools until repaired or replaced,
- Defective power tools shall be tagged OUT of SERVICE until repairs can be made,

- All guards originally supplied with power tools shall be in place when the tool is in use. Guards shall not be altered, modified, or defeated,
- If hand-held power tools are equipped with a constant pressure switch (a dead man switch), the switch shall not be defeated (taped or wired) in order to keep the power on,
- Electrical tools and equipment must be grounded and connected to a ground fault circuit interrupter, and
- Fuel-powered tools shall be stopped when refueled, serviced or maintained. Tools shall be allowed to cool down as necessary before refueling.

3.1.7.2 Pneumatic Tools

- Inspect pneumatic tools before use. Do not use defective pneumatic tools until repaired or replaced,
- Defective pneumatic tools shall be tagged OUT of SERVICE until repairs can be made,
- Hoses supplying pneumatic power tools will be fastened and secured (pinned or wired) and whip check installed to prevent disconnect. Hoses greater than ½-inch inside diameter shall have a shut-off valve at the source,
- When compressed air is used for cleaning, the pressure will be reduced to less than 30 psi or the nozzle shall not be capable of being dead-ended. The trigger mechanism shall be of the constant pressure type, and
- Always bleed the air from the tool/airline and disconnect the airline from the tool before servicing.

3.1.8 Housekeeping

Good housekeeping is a reflection on the employee, a sign of efficiency, and is fundamental to injury prevention. It shall be the responsibility of each employee to keep their work area clean of personal litter (e.g. food scraps, cups and cans), packaging and construction debris. Housekeeping procedures and training requirements are listed in SOP S3AM-013-PR (Housekeeping, Worksite).

The housekeeping requirement for this project is as follows:

- All waste will be placed in trash bags and disposed of at the end of the shift.
- The working area and passageways shall be kept free from loose materials and debris,
- Flammable or combustible materials shall not be stored in areas used for exits or areas normally used for safe passage of people,
- Employees must ensure that their work area is kept clean, neat, and orderly at all times. Employees identifying trash or other debris are responsible to ensure a pick up or cleanup of whatever condition exists, no matter who caused or created it,
- Liquid spills must be controlled and cleaned up immediately by the first person to identify the wet condition, and
- Exits must be free of all obstructions so they can be used immediately in case of an emergency.

Where toilet facilities are not located on the jobsite, the crews shall have transportation readily available to nearby toilet facilities.

3.1.9 Ladders

A stairway, ladder or ramp shall be provided at all points of personnel access where there is a break in elevation of 19 inches or more and no other means of safe access is available. The use of ladders and stairways shall be in compliance with the requirements of 29 CFR 1926 Subpart X. Ladder procedures are listed in SOP S3AM-312-PR (Ladders and Stairways).

Where ladders are used for daily access to the work area, consideration should be given to erecting stair towers or installing temporary stairs.

- Before use ladder will be inspected for physical defects. Defective ladders will be immediately removed from service,

- When two or more separate ladders are used to reach an elevated work area they must be offset with a platform or landing between the ladders,
- Use 3-POINT contact (1 hand, 2 feet or 1 feet, 2 hands) while climbing or descending ladders. Always face the ladder when climbing or descending,
- All straight or extension ladders must extend at least three feet beyond the supporting object when used as an access to an elevated work area,
- After raising the extension portion of a two or more stage ladder to the desired height, check to ensure that the safety dogs or latches are engaged,
- Extension ladders shall not be separated and used as two straight ladders unless the extension ladder has been designed by the manufacturer to be used in two sections,
- All extension or straight ladders must be secured or tied off at the top, and
- Portable ladders must be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is about one-quarter of the working length of the ladder.

3.1.10 Manual Lifting

Many materials associated with investigation and remedial activities are moved by hand. The human body is subject to severe damage in the forms of back injury, muscle strains, or hernia if the proper procedures are not observed. Key components of proper lifting include fitness for duty, lifting only within approved weight limits, keeping the lifted object close to the body, keeping the back straight, lifting as much as possible with the legs, having a solid area for footing, not twisting the body while lifting/carrying, and using team lifting.

A particular concern is safe movement of generators, hoses and pumps on the site. Hazard control measures include requiring a minimum of two staff for any lift over 50 lbs., selection of equipment (e.g. pumps) that are of lower weight, and review by a supervisor or Site Safety Officer (SSO) prior to moving equipment. A task specific JSA will be developed by the project team for equipment movement.

For additional requirements, refer to SOP S3AM-014-PR (Manual Lifting*).*

3.1.11 Overhead Power Lines

A walk though survey of the purposed work area will be conducted by AECOM to identify overhead hazards including overhead power and utility lines that may be adjacent to, the site and represent a potential hazard.

All overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicates that it is not energized.

The minimum clearance distance between overhead power lines and the bucket and/or arm of the backhoe bed/cab of trucks, etc. is ten (10) feet. If work has to be performed closer than ten (10) feet from overhead power lines, the lines must be de-energized and grounded by the owner or operator of the lines, or other protective measures must be provided before work is started. Additional information on working adjacent to overhead power and utility lines can be found in SOP S3AM-322-PR (Overhead Lines) and SOP S3AM-331-PR (Underground Utilities).

Table 3-1: Minimum Safe Working Distance

Line Voltage (Kilovolts)	Minimum Safe Working Distance
0 – 50	10 feet
>50 – 200	15 feet
>200 – 350	20 feet
>350 – 500	25 feet
>500 – 750	35 feet
>750 – 1000	45 feet
Source: American National Standards Institute, Publication B30.5	

3.1.12 Spill Prevention

The following best management practices (BMPs) will be used at all areas of the project site to prevent and contain spills:

- Limit the quantity of material that can be spilled to the environment,
- Non-hazardous or less hazardous materials will be substituted for hazardous materials whenever possible,
- Only Type I or Type II safety cans shall be used. Safety cans shall be equipped with a dispensing funnel or hose, and each container shall be clearly labeled,
- When not in use fuel containers will be stored out of the way in a secure area or off site,
- Equipment will be routinely inspected for leaks of hazardous materials,
- Necessary repairs to equipment will be made immediately or as soon as possible,
- Place drip pans or absorbent pads underneath all containers, fittings, valves, hose connection, drum spigots where spills and leaks can occur, and
- Verify weekly that spill controls clean up materials are located near material storage, unloading, and use areas.

A spill kit /or kits containing a sufficient quantity of absorbent and barrier materials to adequately contain and recover potential spills of fuels or lubricating oils will be maintained on the project . The kit(s) may include, but are not limited to, drip pans, buckets, absorbent pads, straw bales, absorbent clay, sawdust, floor-drying agents, spill containment barriers, heavy plastic sheeting, plastic bags, shovels, and sealable containers. These materials will be readily accessible during all construction activities.

3.1.13 Traffic/Pedestrian Control

During certain work tasks, AECOM will isolate their work areas from the public by using barricades or other effective means of isolation. Signs, signals and barricades shall be visible at all times where a hazard exists.

When working in parking lots general traffic control precautions such as but not limited to placing a work vehicle between your worksite and oncoming traffic whenever possible will be used. The vehicle wheels must turn so that if it was struck, it would swing away from the worksite. Traffic safety cones or other channeling devices shall be used to re-route traffic and pedestrian around the worksite.

Where cones or other channeling devices is used to modify traffic flow, ensure to use the proper taper length and device spacing to provide adequate warning distance to on-coming motor vehicles. In addition, proper PPE is to be worn during traffic operations, to include hardhat and high-visibility vests. Refer to SOP S3AM-306-PR (Highway and Road Work), for additional requirements.

3.1.14 Underground Utilities

Any intrusive activities will be performed in accordance with Lockheed Martin Minimum Requirements for Intrusive Fieldwork Work Plans including the completion of EO-28 (Risk Handling Checklist) and the Dig Permit.

The permit and the checklist shall be completed and approved by the PL before initiating any ground disturbance activities. The PL shall forward these items to the Environment, Safety and Health (ESH) professional, the performing contractor responsible for oversight, and the facility manager, as necessary, for their review.

Prior to any ground disturbance activities AECOM will conduct a utility and underground structure location survey which includes, but is not limited to records research, consultation with site facilities personnel, site inspection to locate physical evidence of underground or overhead utilities or structures and geophysical or other appropriate remote sensing techniques performed by a qualified utility location firm at least two weeks prior to initiating any intrusive activities. The survey shall include the appropriate equipment necessary to detect buried foundations and slabs, piping, direct-bury cables and other buried conduits and structures using the technologies appropriate to the anticipated utilities.

In addition to the utility survey, AECOM will notify Dig Safely NY at 811, two (2) full working days prior to starting our work not counting the day of your call, weekends or holidays. Dig Safely NY will be notified even if all of the work is conducted entirely on Lockheed Martin or other private property.

AECOM shall make all efforts to avoid known or observed utilities in planning the work. If, however, subsurface structures are known or observed by geophysical survey within five feet of the work area and the work area cannot be moved, the performing AECOM/or its subcontractor shall carefully hand dig, vacuum-excavate (soft-dig) or otherwise gently remove the remaining soil vertical feet of the expected top of the utility, then hand to expose the utility a depth of at least 5 feet below ground surface in the proposed areas of subsurface investigation. For additional requirements, refer to SOP S3AM-331-PR (Underground Utilities).

3.2 Biological Hazards

It is anticipated that biological hazards will be present on the project site. Poisonous plants may be found along the tree lines along with ticks and other biting insects. Stinging insects, such as bees and wasps, may build nests within proximity of the work zone. Below is a discussion of the most common biological hazards found on project sites, and those anticipated of being a concern.

During the course of field work employees are at risk of being exposed to poisonous plants, insects, spiders and snakes. The two most prevalent biological hazards are poison ivy and ticks.

3.2.1 Ticks

Ticks transmit bacteria that cause illnesses such as Lyme disease, Powassan or Rocky Mountain spotted fever. Ticks wait for host from the tips of grasses and shrubs (not from trees). When brushed by a moving person, they quickly let go of the vegetation and climb onto the host. Ticks can only crawl; they cannot fly or jump. Tick season typically lasts from April through October; peak season is May through July; seasons can vary depending on climate. Ticks can be active on winter days when the ground temperatures are about 45^{o} Fahrenheit.

The best way to protect oneself against tick borne illness is to avoid tick bites. This includes avoiding known tick- infested areas. However, if you visit wooded areas or areas with tall grass and weeds, follow these precautions to help prevent tick bites and decrease the risk of disease:

- Wear protective clothing such as long-sleeved shirts, long trousers, boots or sturdy shoes and a head covering. Ticks are easier to detect on light-colored clothing.
- Tuck trouser cuffs in socks. Tape the area where pants and socks meet so ticks cannot crawl under clothing.
- Apply insect repellent containing 10 percent to 30 percent DEET or 5 percent to 10 percent picaridin primarily to clothes. Apply sparingly to exposed skin. Do not spray directly to the face; spray the repellent onto hands and then apply to face. Avoid sensitive areas like the eyes, mouth and nasal membranes. Be sure to wash treated skin after coming indoors.
- Use repellents containing permethrin to treat clothes (especially pants, socks and shoes) but not skin. Always follow label directions; do not misuse or overuse repellents.
- Those who wish to avoid the use of insect repellent or treated clothing should consider the use of the Original Bug Shirt® and pants, and tick/chigger garters.
- Personnel should carefully inspect themselves each day for the presence of ticks or any rashes. This is important since prompt removal of the tick can prevent disease transmission. Removal of the tick is important in that the tick should not be crushed and care must be taken so that the head is also removed. Contact the RSHEM for guidelines on removing ticks.
- Report tick exposure and bites to your supervisor.

3.2.2 Wasps and Bees

Wasps (hornets and yellow-jackets) and bees (honeybees and bumblebees) are common insects that may pose a potential hazard to the field team if work is performed during spring, summer or fall. Bees normally build their nests in the soil. However, they use other natural holes such as abandoned rodent nests or tree hollows. Wasps

make a football-shaped, paper-like nest either below or above the ground. Yellow-jackets tend to build their nests in the ground but hornets tend to build their nests in trees and shrubbery. To avoid bees and wasps:

- If you see insects flying to and from a particular place, avoid it.
- If you are going to be in an area where disturbing a nest is likely, wear long pants and a long sleeved shirt. Insect repellent applied to your skin or clothing will not deter these stinging insects.
- Wear light colored clothing.
- Remain as calm as possible if a bee or wasp lands on your skin.
- If you don't want to wait for it to leave, gently and slowly brush it away.
- It is best not to wear perfume, cologne, or other scented soaps or scented shampoos as this attracts bees and wasps.
- Never swing, strike or run rapidly away since quick movement often provokes attack and painful stings.

When a wasp or a bee stings a person, it injects a venomous fluid under the skin. The venom causes a painful swelling that may last for several days. If stung gently scrape the area of the bite using a blunt object like a fingernail or a credit card to remove the stinger. If removed within 15 seconds of the sting, the severity of the sting is reduced. Try not to rub or scratch the sting site after the stinger is removed. Wash the sting site with soap and water. Apply a cold or ice pack wrapped in cloth for a few minutes.

If you develop hives, difficulty breathing or swallowing, wheezing or similar symptoms of allergic reaction, SEEK MEDICAL ATTENTION IMMEDIATELY. People with known allergies to insect stings should NEVER work alone. A person with a history of severe allergic reaction to an insect sting may be advised by their physician to carry an insect sting allergy kit to counteract the allergic reaction whenever they may encounter stinging insects. Also they should consider wearing a medical ID bracelet and notify others on the field team.

3.2.3 Poisonous Plants

Persons working on the site should be aware of the possible presence of poisonous plants. Poison ivy is a climbing plant with leaves that consist of three glossy, greenish leaflets. Poison ivy has conspicuous red foliage in the fall. Small yellowish-white flowers appear in May through July at the lower leaf axils of the plant. White berries appear from August through November. The leaves, roots, stems and fruit of these poisonous plants contain urushiol. Contact with the irritating oil causes an intensely itching skin rash and characteristic blister-like lesions. The oil can be transmitted on soot particles when burned and may be carried on the fur of animals, equipment and apparel.

Proper identification of these plants is the key to preventing contact and subsequent dermatitis (see below).

Poison Ivy

- Grows in West, Midwest, Texas, East
- Several forms – vine, trailing shrub, or shrub
- Three leaflets (can vary 3-9)
- Leaves green in summer, red in fall
- Yellow or green flowers
- White berries

Wear long sleeves and pants when working in wooded areas. In areas of known infestation, wear Tyvek coveralls and gloves. Oils are easily transferred from one surface to another if contact is made with these poisonous plants, wash all exposed surface areas (plastic sheeting, tools, glove, equipment, etc.) in contact with poison ivy wash with cool soapy water or Tecnu's Poison Oak-n-Ivy Cleanser to remove the oils.

3.3 Weather Hazards

The SSO will be attentive to daily weather forecasts for the project area each morning. Predicted weather conditions of potential field impact are to be included in safety briefings and the Task Hazard Analysis (THA) for that day. Weather changes should initiate a review and updates (THA) as necessary. Weather-related hazards will directly correlate to the type of weather involved. Hot, dry weather may cause greater dust emissions, particularly during intrusive activities. Rain may increase slip/trip hazards, particularly for ground workers.

Field activities are not permitted when severe weather conditions exist. The Site Supervisor will monitor real-time weather and local weather forecasts during site work activities. 30-30 Rule: Work will be stopped when there are less than 30 seconds between a flash of lightning and the rumble of thunder and workers will seek shelter promptly. Employees will remain in shelter until 30 minutes after the last flash of lightning or rumble of thunder.
Severe weather can occur with little warning. Employees will be vigilant for the potentials for storms, lightning, high winds, and flash flood events.

3.3.1 Heat Related Illness

Heat stress can be a significant field site hazard, particularly for non-acclimated personnel operating in a hot, humid setting. Site personnel will be instructed in the identification of a heat stress victim, the first-aid treatment procedures for the victim and the prevention of heat stress casualties. Work-rest cycles will be determined and the appropriate measures taken to prevent heat stress as outlined in SOP S3AM-113-PR (Heat Stress).

Measures to Avoid Heat Stress:
The following guidelines should be adhered to when working in hot environments:

- Know the signs and symptoms of heat-related illnesses.
- Observe coworkers for the early symptoms of heat stress-related illnesses.
- Re-evaluate the need for PPE. (Tyvek coveralls could be replaced by an apron).
- Remove excessive PPE at breaks.
- Establish work-rest cycles (short and frequent are more beneficial than long and seldom).
- Identify a shaded, cool rest area.
- Rotate personnel and alternate job functions.
- Two 8-ounce glasses of water should be taken prior to beginning work, then up to 32 ounces per hour during the work shift; fluid replacement at frequent intervals is most effective.
- The best fluid to drink is water; liquids like coffee or soda do not provide efficient hydration, and may increase loss of water.
- If commercial electrolyte drinks (e.g., Gatorade) are used, the drink should be diluted with water, or 8 ounces of water should be taken with each 8 ounces of electrolyte beverage.
- Eat light meals before and during work shifts. Avoid highly salted foods.
- Save most strenuous tasks for non-peak heat hours such as the early morning or at night.
- Avoid alcohol during prolonged periods of heat. Alcohol will cause additional dehydration.
- Avoid double shifts and/or overtime.

The implementation and enforcement of the above mentioned measures will be the joint responsibility of the Project Manager (PM) and the SSO. Potable water and electrolyte drinks should be made available each day for the field team.

3.3.2 Cold Stress

If work on this project is conducted in late fall winter and early spring, thermal injury due to cold exposure can become a problem for field personnel. Work will cease under unusually hazardous conditions (e.g., wind-chill less than 0°F, or wind-chill less than 10°F with precipitation). Systemic cold exposure is referred to as hypothermia. Localized cold exposure is generally labeled frostbite. Recognition of the symptoms of cold related illness will be discussed during the health and safety briefing conducted prior to the onset of site activities. Cold stress is further discussed in SOP S3AM-112-PR (Cold Stress). Cold stress can be prevented using the following guidelines:

- Staff working in extreme cold (wind chill or ECT below 10ºF or -12ºC) shall not work alone.
- Education of workers on the signs and symptoms of hypothermia and frostbite.
- Wear proper clothing for cold, wet and windy conditions, including layers that can be adjusted to changing conditions.
- Take frequent short breaks in warm dry shelters to allow your body to warm up. Limit time of exposure.
- Schedule work for the warmest part of the day or when the wind is most calm.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Because prolonged exposure to cold air or to immersion in cold water at temperatures even well above freezing can lead to dangerous hypothermia, whole-body protection shall be used.
- Ensure the availability of dry changes of clothes;
- Have available warm, sweet beverages (sugar water, sports-type drinks) and avoid drinks with caffeine (coffee, tea, sodas or hot chocolate) or alcohol.
- Monitor co-workers for signs and symptoms of hypothermia and frostbite.

3.4 Hazard Analysis

JSAs/THAs will be compiled for all tasks completed as part of site management activities prior to initiation of the task. Completed JSAs/THAs will be maintained in a separate binder available for review on the project site. As a result of unanticipated work activities or changing conditions outside of the JSAs/THAs may require updates. All JSA/THAs will be reviewed and approved by the SH&E Professional.

3.5 Task Specific SH&E Procedures

Refer to SOP S3AM-209-FM3 (PROCEDURE CHECKLIST) LOCATED IN ATTACHMENT D

4 SH&E REQUIREMENTS (SAFETY)

4.1 HAZWOPER Qualifications

Personnel performing work at the job site must be qualified as HAZWOPER workers (unless otherwise noted in specific THAs or by the SSO, and must meet the medical monitoring and training requirements specified in the AECOM's North America SH&E Standard Operating Procedures.

4.2 Medical Monitoring

AECOM personnel performing activities covered by this SM HASP must be active participants in a medical monitoring program that complies with 29 CFR 1910.120(f) and 29 CFR 1926. Each individual must have completed an annual surveillance examination and/or an initial baseline examination within the last year prior to performing any work on the site covered by this SM HASP.

4.3 Site-Specific Safety Training

All AECOM personnel performing activities at the site will be trained in accordance with SOP S3AM-003-PR (SH&E Training). All personnel are required to remain current in all of their required training and evaluate their need for additional training when there is a change in work. In addition to the general health and safety training programs, personnel will be required to complete any supplemental task specific training developed for the tasks to be performed. Administration and compliance with the requirements for additional task-specific training will be the responsibility of the project or lead manager. Any additional required training that is completed will be documented and tracked in the project files.

4.4 Tailgate Meetings

Prior to the commencement of daily project activities, a tailgate meeting will be conducted by the SSO to review the specific requirements of this SM HASP, applicable THA. Attendance at the daily tailgate meeting is mandatory for all employees at the site covered by this HASP and must be documented on the attendance form. All safety training documentation is to be maintained in the project file by the SSO. A photograph of the completed form may be taken and transferred to the PM via cell phone at the completion of each meeting for incorporation into the electronic project directory.

4.5 Hazard Communication

AECOM will not bring any hazardous substances (as defined by OSHA) onto Lockheed Martin remediation sites unless accompanied by a Safety Data Sheet (SDS) and the containers will be appropriately labeled. SDS will be maintained at the job site. AECOM will notify the Lockheed Martin Project Lead prior to bringing onto Lockheed Martin remediation sites any quantity of hazardous materials.

In accordance with AECOMs SOP S3AM-115-PR (Hazardous Materials Communication), AECOM personnel will be briefed on the hazards of any chemical product they use, and shall be aware of and have access to all SDS.

All containers on the site will be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.).

Attachment B provides copies of SDS for those items planned to be brought on site at the time this SM HASP is prepared. This information will be updated as required during site operations.

4.6 Hazardous, Solid, or Municipal Waste

If generated during activities associated with site management, waste will be stockpiled or stored in designated waste storage areas for disposal. Waste resulting from excavations and decontamination of equipment will be collected, filtered as needed, and disposed of in accordance with the work-specific design. All site waste will be

handled appropriately and transported to a permitted facility for disposal. Non-hazardous wastes (normal trash) will be disposed of in a timely fashion during fieldwork.

4.7 General Safety Rules

All site personnel shall conduct themselves in a safe manner and maintain a working environment that is free of additional hazards, in adherence to SOP S3AM-001-PR (Safe Work Standards and Rules) and SOP S3AM-013-PR (Housekeeping).

4.7.1 First Aid Kit

AECOM will maintain a first aid kit in accordance with 29 CFR 1926.50. In addition, where the eyes or body of any person may be exposed to injurious corrosive materials, dust etc., suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate use. First aid responders are designated to ensure that the first aid kits are properly maintained and stocked.

4.7.2 Housekeeping

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials.

4.7.3 Smoking, Eating, or Drinking

Smoking is not permitted at Lockheed Martin remediation sites. Eating and drinking will not be permitted inside any controlled work area at any time. Field workers will first wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking). Consumption of alcoholic beverages is prohibited at any AECOM site.

4.7.4 Personal Hygiene

The following personal hygiene requirements will be observed:

Water Supply: A water supply meeting the following requirements will be utilized:

Potable Water - An adequate supply of potable water will be available for field personnel consumption. Potable water will be provided in the form of water bottles

Toilet Facilities: For mobile crews where work activities and locations permit transportation to nearby toilet facilities, on-site facilities are not required.

Washing Facilities: Where potable water is not available AECOM will provided waterless hand cleaner and wet-wipes for cleansing of hands and face.

4.7.5 Buddy System

All field personnel will use the buddy system when working within any controlled work area. Personnel belonging to another organization on site can serve as "buddies" for AECOM personnel. Under no circumstances will any employee be present alone in a controlled work area. For areas not in controlled work areas, the procedure outlined in SOP S3AM-314-PR (Working Alone) will be followed at all times.

4.8 Stop Work Authority

All employees have the right and duty to stop work when conditions are unsafe and to assist in correcting these conditions as outlined in SOP S3AM-002-PR (Stop Work Authority). Resumption of safe operations is the

primary objective; however, operations shall not resume until the Safety Professional has concurred that workplace conditions meet acceptable safety standards.

4.9 Work Area Inspections

AECOM will perform periodic work area inspections to determine the effectiveness of the site safety and health plan and to identify and correct unsafe conditions in the work area. These inspections shall be documented and available to Lockheed Martin upon request for review.

5 CADMIUM EXPOSURE CONTROL PLAN

While the anticipated activities that will occur during site management are not expected to result in exposure to cadmium because the engineering control is in place (i.e., the soil cover), there is the potential for ground intrusive activities to become necessary, which would result in the potential for cadmium exposure in the area the intrusive work is being performed.

5.1 Sources of Potential Exposure

Site personnel may be exposed to cadmium as the result of soil sampling actives or additional excavation of cadmium impacted soils, loading of cadmium impacted soils into vehicles for transportation, and related housekeeping activities.

5.2 Permissible Exposure Limit

The OSHA permissible exposure limit (PEL) for the airborne concentration of cadmium as an eight hour time-weighted average is 5 µg/m^3. OSHA has also established an AL of 2.5 µg/m^3 as an eight hour time-weighted average (TWA).

5.3 Cadmium Exposure Hazards

Cadmium is a bluish white, malleable metal and is soluble in acids. Cadmium is used in electroplating, nickel-cadmium storage batteries, as a coating for other metals, in bearing and low melting alloys and as control rods in nuclear reactors.

Cadmium is a natural element in the earth's crust. It is usually found as a mineral combined with other elements such as oxygen (cadmium oxide), chlorine (cadmium chloride), or sulfur (cadmium sulfate, cadmium sulfide). All soils and rocks, including coal and mineral fertilizers, contain some cadmium. Most cadmium used in the United States is extracted during the production of other metals like zinc, lead, and copper. Cadmium does not corrode easily and has many uses, including batteries, pigments, metal coatings, and plastics.

Inhaling high levels of cadmium can severely damage the lungs and can cause death. Eating food or drinking water with very high levels can severely irritate the stomach, leading to vomiting and diarrhea. Long-term exposure to lower levels of cadmium in air, food, or water leads to a buildup of cadmium in the kidneys and possible kidney disease. Other long-term effects are lung damage and fragile bones. It is unknown if humans develop any of these diseases from ingesting (eating or drinking) cadmium. There are no known health effects from dermal contact with cadmium in humans or animals.

5.4 Personal Hygiene

Where water is not readily available waterless hand cleaners such as D-Lead ® towels or equivalent may be used.

Site personnel must wash face and hands prior to breaks, lunch and at the end of the shift. Employees should not eat, drink, use tobacco products, or apply cosmetics until hands and face have been washed.

Food, drink, tobacco products and cosmetics may not be brought into any area.

6 PERSONAL PROTECTIVE EQUIPMENT

6.1 Personal Protective Equipment

The purpose of personal protective equipment (PPE) is to provide a barrier, which will shield or isolate individuals from the chemical and/or physical hazards that may be encountered during work activities. SOP S3AM-208-PR (Personal Protective Equipment) lists the general requirements for selection and usage of PPE. Table 6-1 lists the minimum PPE required during site operations and additional PPE that may be necessary. The specific PPE requirements for each work task are specified in the individual THAs.

Table 6-1: Personal Protective Equipment

TYPE	USE	ADDITIONAL INFORMATION
Minimum PPE		
Safety Vest or high-visibility outer garment	Working on or near traffic, parking lots, or heavy equipment	ANSI Type II high-visibility
Boots	All times during field work	ANSI/ASTM approved safety toe
Safety Glasses	All times during field work	ANSI Approved; ≥98% UV protection
Hard Hat	As required where the potential for overhead hazards to exists	ANSI Approved; recommended wide-brim
Work Uniform		No shorts/cutoff jeans or sleeveless shirts
Additional PPE:		
Hearing Protection	Ear plugs and/ or muffs	In hazardous noise areas
Leather Gloves	If working with sharp objects or powered equipment and while performing any other manual labor.	Cut resistant 4 or higher
Face Shield	Where splash/flying particles is anticipated.	Safety glasses or goggles must be worn concurrently.

6.2 PPE Information

6.2.1 Inspection of PPE

Before use of protective clothing, all personnel shall determine that the clothing material is correct for the specified task at hand. The clothing is to be visually inspected for imperfect seams, non-uniform coatings, tears and malfunctioning closures. It is to be held up to the light to check for pinholes. It is to be flexed to observe for cracks or other signs of shelf deterioration. If the product has been used previously, it should be inspected inside and out for signs of chemical deterioration, such as discoloration, swelling and stiffness. During work, the clothing should be periodically inspected for evidence of chemical deterioration, closure failure, tears, punctures and seam discontinuities.

Before using gloves, check for pinhole leaks. Face shields and lenses should be checked for cracks, crazing and fogginess. It is imperative that any equipment found to be defective be replaced immediately.

7 PROJECT HEALTH AND SAFETY ORGANIZATION

7.1 Project Manager

The PM has overall management authority and responsibility for all site operations, including safety. The PM will provide the site supervisor with work plans, staff, and budgetary resources, which are appropriate to meet the safety needs of the project operations.

7.2 Site Supervisor

The site supervisor has the overall responsibility and authority to direct work operations at the job site according to the provided work plans. The PM may act as the site supervisor while on site.

7.2.1 Responsibilities

The site supervisor is responsible to:

- Discuss deviations from the work plan with the SSO and PM.
- Discuss safety issues with the PM, SSO, and field personnel.
- Assist the SSO with the development and implementation of corrective actions for site safety deficiencies.
- Assist the SSO with the implementation of this SM HASP and ensuring compliance.
- Assist the SSO with inspections of the site for compliance with this SM HASP and applicable SOPs.

7.2.2 Authority

The site supervisor has authority to:

- Verify that all operations are in compliance with the requirements of this SM HASP, and halt any activity that poses a potential hazard to personnel, property, or the environment.
- Temporarily suspend individuals from field activities for infractions against the SM HASP pending consideration by the SSO, the Safety Professional, and the PM.

7.2.3 Qualifications

In addition to being Hazardous Waste Operations and Emergency Response (HAZWOPER)-qualified (see Section 4.1), the Site Supervisor is required to have completed the 8-hour HAZWOPER Supervisor Training Course in accordance with 29 CFR 1910.120 (e)(4).

7.3 Site Safety Officer – designated by task/event

7.3.1 Responsibilities

The SSO is responsible to:

- Update the site-specific SM HASP to reflect changes in site conditions or the scope of work. SM HASP updates must be reviewed and approved by the Safety Professional.
- Be aware of changes in AECOM Safety Policy.
- Monitor the lost time incidence rate for this project and work toward improving it.
- Inspect the site for compliance with this SM HASP and the SOPs using the appropriate audit inspection checklist provided by an AECOM Safety Professional.
- Work with the site supervisor and PM to develop and implement corrective action plans to correct deficiencies discovered during site inspections. Deficiencies will be discussed with project management to determine appropriate corrective action(s).
- Contact the Safety Professional for technical advice regarding safety issues.
- Provide a means for employees to communicate safety issues to management in a discreet manner (i.e., suggestion box, etc.).
- Determine emergency evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation.
- Check that all site personnel and visitors have received the proper training and medical clearance prior to entering the site.
- Establish any necessary controlled work areas (as designated in this SM HASP or other safety documentation).
- Present tailgate safety meetings and maintain attendance logs and records.
- Discuss potential health and safety hazards with the Site Supervisor, the Safety Professional, and the PM.

7.3.2 Authority

The SSO has authority to:

- Verify that all operations are in compliance with the requirements of this SM HASP.
- Issue a “Stop Work Order” under the conditions set forth in this SM HASP.
- Temporarily suspend individuals from field activities for infractions against the SM HASP pending consideration by the Safety Professional and the PM.

7.3.3 Qualifications

In addition to being HAZWOPER-qualified, the SSO is required to have completed the 8-hour HAZWOPER Supervisor Training Course in accordance with 29 CFR 1910.120 (e)(4).

7.4 Employees

7.4.1 Employee Responsibilities

Responsibilities of employees associated with this project include, but are not limited to:

- Understanding and abiding by the policies and procedures specified in the SM HASP and other applicable safety policies, and clarifying those areas where understanding is incomplete.
- Providing feedback to health and safety management relating to omissions and modifications in the SM HASP or other safety policies.
- Notifying the SSO, in writing, of unsafe conditions and acts.

7.4.2 Employee Authority

The health and safety authority of each employee assigned to the site includes the following:

- The right to refuse to work and/or stop work authority when the employee feels that the work is unsafe (including subcontractors or team contractors), or where specified safety precautions are not adequate or fully understood.
- The right to refuse to work on any site or operation where the safety procedures specified in this SM HASP or other safety policies are not being followed.
- The right to contact the SSO or the Safety Professional at any time to discuss potential concerns.
- The right and duty to stop work when conditions are unsafe, and to assist in correcting these conditions

7.5 Safety Professional

The Safety Professional (Peter Gregory) is the member of the AECOM Safety, Health and Environmental staff assigned to provide guidance and technical support for the project. Duties include the following:

- Approving this SM HASP and any required changes.
- Investigating any reported unsafe acts or conditions.

7.6 Subcontractors

While the use of subcontractors during site management activities is not anticipated, if additional ground intrusive activities are required, subcontractors may be used. Subcontractors are responsible for the safety and health of their employees. Subcontractors shall ensure compliance with all applicable Federal, State, and local laws, rules, regulations, and guidelines governing safety, health and sanitation. At a minimum the Subcontractor must follow the applicable provisions of this SM HASP.

The subcontractors must provide all safeguards, safety devices, and protective equipment, and should take any other actions necessary to protect the life, safety and health of persons working at or visiting the project site and of the public, and property in connection with the performance of the work covered by the contract.

AECOM considers each subcontractor to be an expert in all aspects of the work operations for which they are tasked to provide, and each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services. Each subcontractor is expected to perform its operations in accordance with its own unique safety policies and procedures, in order to ensure that hazards associated with the performance of the work activities are properly controlled. Copies of any required safety documentation for a subcontractor's work activities will be provided to AECOM for review prior to the start of onsite activities, if required.

Hazards not listed in this SM HASP but known to any subcontractor, or known to be associated with a subcontractor's services, must be identified and addressed to the AECOM PM or the Site Supervisor prior to beginning work operations. The Site Supervisor or authorized representative has the authority to halt any subcontractor operations, and to remove any subcontractor or subcontractor employee from the site for failure to comply with established health and safety procedures or for operating in an unsafe manner.

7.7 Visitors

Authorized visitors (e.g., client representatives, regulators, AECOM management staff, etc.) requiring entry to any work location on the site will be briefed by the PM on the hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for compliance with their employer's health and safety policies. In addition, this SM HASP specifies the minimum acceptable qualifications, training and personal protective equipment which are required for entry to any work area; visitors must comply with these requirements at all times.

7.7.1 Visitor Access

Visitors to any work area must comply with the health and safety requirements of this SM HASP. All visitors desiring to enter any work area must observe the following procedures:

1. Each visitor will be briefed on the hazards associated with the site activities being performed and acknowledge receipt of this briefing by signing the appropriate tailgate safety meeting form.

2. All visitors must be escorted by an AECOM employee.

If the site visitor does not comply with the above requirements, all work activities must be suspended. Until these requirements have been met, entry will not be permitted. Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within established work areas.

8 SITE CONTROL

Due to the nature of the site management activities, no fixed, specific site location is anticipated. Should additional ground intrusive activities in the future be required, this HASP will be updated accordingly.

9 EMERGENCY RESPONSE PLANNING

9.1 Emergency Action Plan

The purpose of this Emergency Response Plan is to outline the necessary procedures to be implemented at the Lockheed Martin project in response to unexpected situations that may develop as the result of project activities. An Emergency Coordinator (EC) will be assigned for the site activities that will be responsible for the following duties:

- Implement the EAP based on the identified emergency condition
- Notify the appropriate project and SH&E Department personnel of the emergency (Table 9-1)
- Verify emergency evacuation routes and muster points are accessible

9.2 Communications System

AECOM personnel will have available cellular telephones while on the site. In small work groups where individuals are working in proximity to each other, which is anticipated for the site management activities, a verbal warning signal will be used for alerting personnel of hazardous conditions or an evacuation.

9.3 Evacuation Assembly Areas

A designated evacuation assembly area shall be established. The location of the assembly area will be communicated to personnel. In the event of an emergency, personnel shall evacuate to the designated assembly area. Evacuation routes will be clearly communicated to personnel. This information will be discussed during the Toolbox Safety Meetings. The Muster Point will be determined during the THA process each morning prior to the specific site management activity.

9.4 Procedures to Account for Personnel

Personnel shall immediately report to the designated assembly area and remain there. A roll call shall be count to account for all personnel and to verify that total evacuation has taken place.

9.5 Site-Specific Emergency Procedures

9.5.1 Fire

In the event of a fire, personnel shall sound the fire alarm and evacuate the area. However, if a person believes that the fire can be extinguished with a portable extinguisher, they should proceed to do so. If a fire cannot be extinguished in 30 seconds using a portable fire extinguisher the area shall be evacuated and the Fire Department called. Regardless of extinguishing efforts, the local Fire Department shall be notified. The response to a fire is as follows:

- Call the fire department.
- Evacuate the affected area or initiate evacuation by sounding the alarm or verbally warning others. Do not return to burning or smoked-filled areas.

- Report to the designated assembly area.
- Dispatch a person to greet the fire department and lead them to the scene.

9.5.2 Medical Emergency Response

The term “medical emergency” means different things in different contexts. In regards to a person, a medical emergency is any life-threatening condition that requires immediate medical intervention to restore breathing, controls bleeding, restore circulation, or prevent shock. In regards to incidents on the job, a medical emergency is also an event in which two or more people receive injuries as the result of single incident.

The immediate response to either type of medical emergency is as follows:

- Take control of the situation;
- Ensure personal safety and the safety of others;
- Assist and evaluate the victim(s). Do not try to move the victim(s);
- Direct someone to call 911;
- Dispatch a person to greet the fire department or ambulance and lead the emergency personnel to the scene;
- Do not attempt to perform any type of technical rescue.

If the person is suffering from a back or neck injury, do not move the person. The SSO must familiarize the responding emergency personnel about the nature of the site and the injury.

9.5.3 Spill Containment Procedure

In case of a spill or release of hazardous chemicals, AECOM shall immediately notify the Lockheed Martin Project Lead, and/or if the severity of the spill warrants, the local fire department by calling 911. AECOM will take all necessary steps to control the spread of the release and to provide site control to prevent unauthorized personnel from entering the affected area.

The response for a release of potentially hazardous chemicals entails of the following:

- Determine the nature of the substance released
- Eliminate all sources of ignition
- Isolate the affected area or initiate area evacuation
- Contain the flow of the material from the source if this can be done safely
- Following the procedures and using the protective equipment as indicated by the Safety Data Sheet (SDS), contain the release to the smallest area possible and initiate cleanup
- Dispose of all residues in accordance with the SDS.
- Notify the Lockheed Martin Project Lead

When on-site efforts cannot mitigate the hazard in a timely manner or the material poses a fire or explosion hazard or is a threat public safety, the site and surrounding area shall be evacuated and the Fire Department (911) shall be immediately notified.

All releases will be contained if necessary (if larger than an incidental spill) and cleaned up in a timely manner. This clean up may require the services of an outside contractor.

In the event of an oil or hazardous material release that exceeds normal operation levels (incidental release) AECOM will notify the Lockheed Martin Project Lead of the release. AECOM will provide guidance to Lockheed Martin or the subcontractor if the release has to be reported to the New York State DEC. It is ultimately the responsibility of the spiller to report the spill within two hours of occurrence; however, anyone (AECOM, Lockheed Martin, etc.) with knowledge is obligated to report it if the spiller does not.

Should it be determined that the spill should be reported to the New York State DEC the spiller should report the spill using the New York State Spill Hotline. Federal agencies can be notified by calling the National Response

Center (typically the National Response Center is notified following a release that presents an imminent threat to human health or the environment).

- New York State Spill Hotline – (800) 457-7362
- National Response Center – (800) 424-8802

Where the above-cited agencies have to be notified, the following information will be provided:

- Caller's Name
- Site Address:
- Location of spill or release (e.g. bodies of water)
- Date, time and type of incident (e.g. spill or fire)
- Quantity and type of hazardous materials involved
- Duration of release and corrective actions being taken
- Estimated quantity and disposition of recovered materials
- Extent of injuries if any

9.6 Safety Accident/Incident Reporting

AECOM must notify Lockheed Martin Project Lead and/or Lockheed Martin Safety & Health Manager in the event of a fatality, injury, environmental release (spill), near-miss incident, or any ESH incident that is likely to generate significant publicity. A written report of the incident/injury/spill and corrective action(s) taken shall be submitted to the Lockheed Martin Project Lead within one (1) day of the incident.

All accidents and incidents that occur on-site during any field activity will be promptly reported to the SSO, the immediate supervisor, regional safety health and environmental manager (RSHEM).

If any AECOM employee is injured and requires medical treatment, the Site Supervisor will report the incident in accordance with AECOM's incident reporting procedures. A copy of the final Supervisor's Report of Incident will be provided to the SH&E Professional before the end of the following shift.

If any employee of a subcontractor is injured, documentation of the incident will be accomplished in accordance with the subcontractor's procedures; however, copies of all documentation (which at a minimum must include the OSHA Form 301 or equivalent) must be provided to the SSO within 24 hours after the accident has occurred.

All accidents/incidents will be investigated. Copies of all subcontractor accident investigations will be provided to the SSO within one (1) day of the accident/incident.

Table 9-1: Emergency Contacts

Emergency Coordinators / Key Personnel			
Name	**Title/Workstation**	**Telephone Number**	**Mobile Phone**
Jill Fonte	Client Contact	315.456.1993	315-944-8082
Nickcole Evans	Account/Client Manager/Project Manager	None	315.243.1624
Dan Servetas	Program Director	973.572.3916	973-777-3003
Peter Gregory	Northeast Regional SH&E Manager	973.883.8683	201.602.3511
Mark Darrington	Lockheed Martin Client Account Mgr.	843.740.7332	843.343.4204
Organization / Agency			
Name		**Telephone Number**	
Electronics Park Facility Patrol			315.456.2917
Electronics Park Emergency			315.456.2111
Police Department (local)			911
Fire Department (local)			911
Ambulance Service ***(EMT will determine appropriate hospital for treatment)***			911
Emergency Hospital (Upstate Medical Center)			315-464-8668
Emergency Hospital Route: See Figure 9-1			
Organization / Agency			
Name			**Telephone Number**
AECOM Nurse Hotline: 24-hr On-Call Occupational Nurse **(*Non-Emergency assistance only – Employees must notify SH&E prior to calling*)**			(877) 878-9525
AECOM Incident Reporting Hotline			(800) 348-5046
New York State Spill Hotline			(800) 457-7362
National Response Center			(800) 424-8802
Public Utilities			
Name		**Telephone Number**	
Dig Safely NY			811

Figure 9-1: Hospital Route/Detail Map

Directions From:
Old Liverpool Road, Liverpool NY

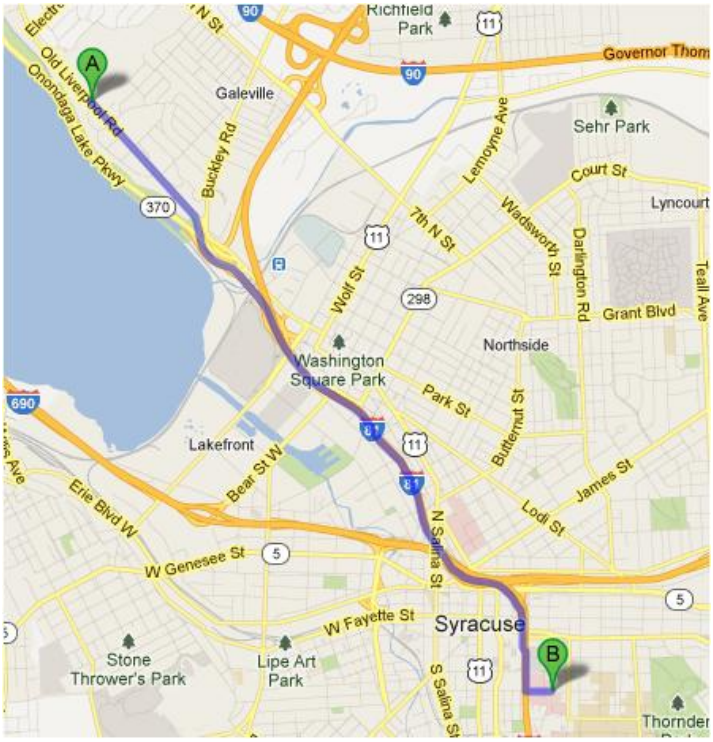
Driving directions to Upstate Medical University Hospital

3D

A Old Liverpool Rd
Liverpool, NY 13088

1. Head **southeast** on **Old Liverpool Rd** toward **Lakeview Dr** — 1.1 mi
2. Keep right at the fork, follow signs for **I-81 S/Syracuse** and merge onto **I-81 S** — 2.7 mi
3. Take exit **18** toward **Harrison St/Adams St** — 0.1 mi
4. Keep left at the fork, follow signs for **Adams Street** — 164 ft
5. Turn right onto **Almond St** — 0.2 mi
6. Turn left onto **E Adams St**
Destination will be on the right — 0.1 mi

B Upstate Medical University Hospital
750 E Adams St
Syracuse, NY 13210



10 PERSONNEL ACKNOWLEDGEMENT

By signing below, the undersigned acknowledges that he/she has read and reviewed the AECOM Site Management Health and Safety Plan for the Bloody Brook site. The undersigned also acknowledges that he/she has been instructed in the contents of this document and understands the information pertaining to the specified work, and will comply with the provisions contained therein.

PRINT NAME	SIGNATURE	ORGANIZATION	DATE

Attachment A

Job Safety Analyses (JSAs)

Job Safety Analyses (JSAs) will be completed prior to specific tasks and maintained in a separate binder at the project site.

Attachment B

Safety Data Sheets

Nitric Acid, 10% v/v (1+9)

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 10/31/2013 Revision date: 10/01/2015 Supersedes: 10/01/2015 Version: 1.1

SECTION 1: Identification

1.1. Identification

Product form : Mixture

Product name : Nitric Acid, 10% v/v (1+9)

Product code : LC17730

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : For laboratory and manufacturing use only.

1.3. Details of the supplier of the safety data sheet

LabChem Inc
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
Zelienople, PA 16063 - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 or 011-703-527-3887

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Met. Corr. 1 H290 - May be corrosive to metals
Skin Corr. 1B H314 - Causes severe skin burns and eye damage
Eye Dam. 1 H318 - Causes serious eye damage

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS05

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H290 - May be corrosive to metals
H314 - Causes severe skin burns and eye damage

Precautionary statements (GHS-US) : P234 - Keep only in original container
P260 - Do not breathe mist, vapors, spray
P264 - Wash exposed skin thoroughly after handling
P280 - Wear protective gloves, protective clothing, eye protection, face protection
P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a poison center or doctor/physician
P363 - Wash contaminated clothing before reuse
P390 - Absorb spillage to prevent material damage
P405 - Store locked up
P406 - Store in corrosive resistant container with a resistant inner liner
P501 - Dispose of contents/container to comply with local, state and federal regulations
If inhaled: Remove person to fresh air and keep comfortable for breathing

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	90.5	Not classified
Nitric Acid, 70% w/w	(CAS No) 7697-37-2	9.5	Ox. Liq. 3, H272 Met. Corr. 1, H290 Skin Corr. 1A, H314 Eye Dam. 1, H318

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician.

First-aid measures after skin contact : Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a poison center or doctor/physician.

First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor/physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Causes severe skin burns and eye damage.

Symptoms/injuries after eye contact : Causes serious eye damage.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Reactivity : Thermal decomposition generates : Corrosive vapors.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Protective goggles. Protective clothing. Gloves. Combined gas/dust mask with filter type B/P3.

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials. Absorb spillage to prevent material damage.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : May be corrosive to metals.

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. Do not breathe mist, vapors, spray.

Hygiene measures : Wash exposed skin thoroughly after handling. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Comply with applicable regulations.

Storage conditions : Keep only in the original container in a cool, well ventilated place away from : incompatible materials. Keep container closed when not in use.

Incompatible products : Strong bases. Halogens. metals. aluminum. Strong reducing agents.

Incompatible materials : Sources of ignition. Direct sunlight.

Packaging materials : Store in corrosive resistant/… container with a resistant inner liner.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Nitric Acid, 70% w/w (7697-37-2)		
ACGIH	ACGIH TWA (ppm)	2 ppm
ACGIH	ACGIH STEL (ppm)	2 ppm
OSHA	OSHA PEL (TWA) (mg/m³)	5 mg/m³
OSHA	OSHA PEL (TWA) (ppm)	2 ppm

8.2. Exposure controls

Appropriate engineering controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Provide adequate general and local exhaust ventilation.

Personal protective equipment : Avoid all unnecessary exposure. Combined gas/dust mask with filter type B/P3. Gloves. Protective clothing. Protective goggles.

Hand protection : Wear protective gloves.

Eye protection : Chemical goggles or face shield.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : Wear appropriate mask.

Other information : Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid

Appearance : Colorless to pale yellow liquid.

Color : Colourless to light yellow

Odor : characteristic Pungent

Odor threshold : No data available

pH : No data available

Melting point : No data available

Freezing point : No data available

Boiling point : No data available

Flash point : No data available

Relative evaporation rate (butyl acetate=1) : No data available

Flammability (solid, gas) : No data available

Explosion limits	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available
Vapor pressure	:	No data available
Relative density	:	No data available
Relative vapor density at 20 °C	:	No data available
Specific gravity / density	:	1.05 g/ml
Solubility	:	Soluble in water. Water: Solubility in water of component(s) of the mixture : • Nitric Acid, 70% w/w:
Log Pow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity	:	No data available
Viscosity, kinematic	:	0.99 cSt
Viscosity, dynamic	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Thermal decomposition generates : Corrosive vapors.

10.2. Chemical stability

Not established.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong reducing agents. Strong bases. metals. aluminum. Ammonia. combustible materials. Halogens.

10.6. Hazardous decomposition products

Nitrogen oxides. Thermal decomposition generates : Corrosive vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure	:	Inhalation; Skin and eye contact
Acute toxicity	:	Not classified

Water (7732-18-5)	
LD50 oral rat	≥ 90000 mg/kg
ATE US (oral)	90000.000 mg/kg body weight

Skin corrosion/irritation	:	Causes severe skin burns and eye damage.
Serious eye damage/irritation	:	Causes serious eye damage.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

Symptoms/injuries after eye contact : Causes serious eye damage.

SECTION 12: Ecological information

12.1. Toxicity

Nitric Acid, 70% w/w (7697-37-2)	
LC50 fish 1	25 - 36 mg/l (96 h; Lepomis macrochirus; Pure substance)
EC50 Daphnia 1	180 mg/l (48 h; Daphnia magna; Pure substance)
LC50 fish 2	72 ppm (Gambusia affinis; Pure substance)
Threshold limit algae 1	> 19 mg/l (Algae; Pure substance)

12.2. Persistence and degradability

Nitric Acid, 10% v/v (1+9)	
Persistence and degradability	Not established.

Nitric Acid, 70% w/w (7697-37-2)	
Persistence and degradability	Biodegradability: not applicable. No test data on mobility of the components available.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
BOD (% of ThOD)	Not applicable

Water (7732-18-5)	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

Nitric Acid, 10% v/v (1+9)	
Bioaccumulative potential	Not established.

Nitric Acid, 70% w/w (7697-37-2)	
BCF fish 1	<= 1 (Pisces)
Log Pow	-2.3 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method)
Bioaccumulative potential	Bioaccumulation: not applicable.

Water (7732-18-5)	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the global warming : No known ecological damage caused by this product.

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to comply with local, state and federal regulations.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN2031 Nitric acid other than (red fuming, with not more than 20 percent nitric acid), 8, II

UN-No.(DOT) : UN2031

Proper Shipping Name (DOT)	:	Nitric acid other than red fuming, with not more than 20 percent nitric acid
Transport hazard class(es) (DOT)	:	8 - Class 8 - Corrosive material 49 CFR 173.136
Hazard labels (DOT)	:	8 - Corrosive

Packing group (DOT)	:	II - Medium Danger
DOT Packaging Non Bulk (49 CFR 173.xxx)	:	158
DOT Packaging Bulk (49 CFR 173.xxx)	:	242
DOT Special Provisions (49 CFR 172.102)	:	A6 - For combination packaging, if plastic inner packaging are used, they must be packed in tightly closed metal receptacles before packing in outer packaging. B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are not authorized. B47 - Each tank may have a reclosing pressure relief device having a start-to-discharge pressure setting of 310 kPa (45 psig). B53 - Packaging must be made of either aluminum or steel. IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized. T8 - 4 178.274(d)(2) Normal..... Prohibited TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively. TP12 - This material is considered highly corrosive to steel.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	None
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	1 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	30 L
DOT Vessel Stowage Location	:	D - The material must be stowed ‘‘on deck only’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.
Other information	:	No supplementary information available.

TDG

No additional information available

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

Nitric Acid, 10% v/v (1+9)	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

Nitric Acid, 70% w/w (7697-37-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lb
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

Water (7732-18-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

Nitric Acid, 10% v/v (1+9)	
WHMIS Classification	Class E - Corrosive Material

Nitric Acid, 70% w/w (7697-37-2)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class E - Corrosive Material Class C - Oxidizing Material

Water (7732-18-5)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

EU-Regulations

No additional information available

National regulations

Nitric Acid, 70% w/w (7697-37-2)
Listed on the Canadian IDL (Ingredient Disclosure List)

15.3. US State regulations

No additional information available

SECTION 16: Other information

Revision date : 10/01/2015

Other information : None.

Full text of H-phrases: see section 16:

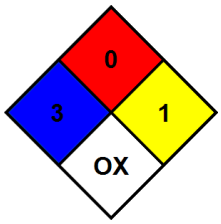
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Met. Corr. 1	Corrosive to metals Category 1
Ox. Liq. 3	Oxidizing liquids Category 3
Skin Corr. 1A	Skin corrosion/irritation Category 1A
Skin Corr. 1B	Skin corrosion/irritation Category 1B
H272	May intensify fire; oxidizer
H290	May be corrosive to metals
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage

NFPA health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.

NFPA specific hazard : OX - This denotes an oxidizer, a chemical which can greatly increase the rate of combustion/fire.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

Personal Protection : H

H - Splash goggles, Gloves, Synthetic apron, Vapor respirator

Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for his application.

Attachment C

Standard Operating Procedures (SOPs)

Standard Operating Procedures (SOPs) will be maintained in a separate binder at the project site.

APPENDIX I

Site-Wide Inspection Form

Bloody Brook
Liverpool, NY
Site-Wide Inspection Form

Engineering Control: Soil Cover Inspection Date:_____

Item	Yes	No	N/A	Comments
Was ponding observed in any areas of the soil cover? If so, identify the stream mile marker in the comment section of this form.				
Were areas of erosion observed in the soil cover or along the streambed? If so, identify the stream mile marker in the comment section of this form.				
Based on the above items, does the engineering control continue to perform as designed?				
Were the weirs and piezometers within the wetland areas inspected and appear to be in good condition, functioning as designed?				
Were the permanent plot, transect, and photo locations within the wetlands clearly marked?				
Has there been any apparent intrusive activity, excavation, or construction at the site? If so, were the activities performed in accordance with the SMP?				
Were vegetation and wetland monitoring completed during this site inspection? If so, were the vegetation inspection logs completed?				

Note: Upon completion of the form, any non-conforming items warranting corrective action should be identified here within.

Name of Inspector: _____ Signature of Inspector: _____
Inspector's Company: _____ Date: _____

IMMEDIATELY REPORT ANY FAILURE OR DEFECT TO THE PROJECT MANAGER SO A COUNTERMEASURE PLAN CAN BE IMPLEMENTED.

APPENDIX J

Restoration Monitoring Plan

BLOODY BROOK
ONONDAGA COUNTY
LIVERPOOL, NEW YORK

Site Management Restoration Monitoring Plan

Prepared for:
Lockheed Martin Corporation
497 Electronics Parkway
Building EP-6, Room 100B
Liverpool, New York 13088

Prepared by:
AECOM
5015 Campuswood Drive, Suite 104
E. Syracuse, NY 13057

March 2019

Contents

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1.0 Introduction

This *Restoration Monitoring Plan* (RMP) has been prepared to summarize the monitoring activities to evaluate the success of restoration at the Bloody Brook site. The required activities discussed herein pertain specifically to vegetative survival, erosion of brook bottom and side banks, and wetland habitat development. Other aspects related to the site remediation that require post-remediation monitoring, including biological monitoring, are detailed in other sections of the SMP.

The first two annual restoration monitoring events were completed in spring 2017 and spring 2018. Following an adaptive management approach to the development of the wetlands, a revised planting plan was developed as part of the NYSDEC approved August 2018 *Restoration Monitoring Summary Report*. The current designations for habitat areas and plantings in the wooded area as developed as part of the revised planting plan are presented on Figure 1 and summarized in Table 1 in this RMP.

1.1 Site Description

The Bloody Brook site was broken into four distinct areas based on land use and characteristics as described below**.**

- Wooded Area – This portion of the site extends from the Thruway south (downstream) approximately 1,050 feet. This undeveloped area is irregularly shaped and relatively wide (i.e., greater than 150 feet) and includes three wetlands. The wooded area is entirely within the Onondaga County Bloody Brook Drainage District (Drainage District) easement and is owned by the Town of Salina. The Drainage District easement provides Onondaga County personnel permanent access to Bloody Brook for various projects to improve and maintain drainage. Storm water drainage from the surrounding development enters the WBBB from the west via a drainage channel at the southern end of the wooded area.

- Residential Area – The residential area surrounds the wooded area commencing at the Thruway and extending downstream of the wooded area with residential properties abutting the Drainage District easement along the WBBB to the downstream side of Floradale Road.

- Apartment Complex Area – The apartment complex area is located on Pearl Street and Town Gardens Drive between the residential properties along Floradale Road and the commercial properties along Old Liverpool Road.

- Commercial Area – The commercial area extends from commercial properties located along Old Liverpool Road to Onondaga Lake Parkway.

2.0 Summary of Completed Vegetation Restoration Activities

Sections 2.1 through 2.5 below summarize the construction and restoration activities related to vegetation disturbance (including tree removal) and vegetation replacement (including seed, emergent plant, tree, and shrub planting) completed at the site. The tree removal and vegetation replacement activities were completed in accordance with the NYSDEC approved work plans listed below.

- *2014 Wooded Area Tree Removal Work Plan* (January 2014)
- *2014 Construction Work Plan* (March 2014)
- *2014 Revised Restoration Work Plan* (August 2014)
- *2014 Tree Removal Work Plan for 2015 Construction Season* (November 2014)
- *Tree Removal Work Plan and Waste Characterization Soil Sampling Plan for the 2016 Construction Season* (October 2015)
- *2015 Construction and Restoration Work Plan* (February 2015)
- *2016 Construction and Restoration Work Plan* (March 2016)

Section 2.4 discusses deviations from the proposed work based on field changes made during construction activities. All field changes were approved by NYSDEC prior to implementation.

Section 2.5 addresses restoration and maintenance completed as part of the adaptive management approach and following recommendations based on the annual monitoring events completed to date, per the following NYSDEC approved work plans and maintenance summary reports:

- 2017 *Restoration Maintenance Work Plan* (October 2017) and *Restoration Maintenance Summary Report* (July 2018)
- 2018 *Restoration Maintenance Work Plan* (October 2018) and *Restoration Maintenance Summary Report* (February 2019)

2.1 Pre-Construction Tree Removal

Tree surveys and subsequent tree removals were completed prior to starting the site excavation activities. While tree removal was minimized where possible, trees were removed from all areas of the site, and new trees were planted as described below. The tree removals and replacements were completed in accordance with the NYSDEC approved work plans listed above.

2.2 Wooded Area

The disturbed land located in the wooded area is within the Drainage District easement which is owned by the Town of Salina and managed by Onondaga County. The remedial activities within the wooded area included disturbance of wetlands, upland areas outside of the wetlands, and removal of trees. Restoration of the wooded area included seeding and planting of wetlands and upland areas and replacement of forest and shrub habitat. Emergent wetlands were seeded with a wetland seed mix, and emergent plants were planted. Forested and shrub/scrub wetlands were also seeded with a wetland seed mix to provide an emergent wetland cover as the trees and shrubs grow. To provide a natural look to the wetland forested and shrub/scrub plantings, trees and shrubs were placed in random with no identical tree or shrub species placed directly next to its equal. The upland areas were seeded with riparian and meadow seed mixes. Upland forested

areas were planted with a woodland seed mix, and trees were planted with a shrub understory. Upland and wetland seed mixes are provided in Attachment A.

2.3 Residential, Apartment Complex, and Commercial Areas

Condition of lawns, vegetation cover, trees, and landscaping features within residential properties, the apartment complex, and commercial properties were documented as part of a precondition survey. As part of the remedial activities, the vegetation cover was disturbed and trees were removed. Residential properties, the apartment complex, and commercial properties were restored as close as practical to pre-existing conditions with consideration for input from the property owner and typically included the placement of sod and/or grass seed, trees, shrubs, and other plantings similar to what was removed from the property.

In the Drainage District easement within the residential, apartment complex, and commercial areas (i.e., outside of the wooded area), it was proposed to restore and seed the area with a Northeastern U.S. Roadside Native Mix (ERNMX-105) (Attachment A). However, based on a request from Onondaga County Department of Water Environment Protection (OCDWEP), a field change was implemented in September 2015 that included planting low maintenance ground cover along the top of the banks in portions of this area. Details of this field change are provided in Section 2.4.

To accommodate the property owner, the remediation was not completed for the apartment complex area outside of the brook until 2017. Annual restoration monitoring for this area began in 2018.

2.4 Field Changes to Vegetation Restoration Activities

Final restoration and planting was completed in accordance with the NYSDEC approved *2014 Revised RWP* and other work plans listed above in Section 2.0 with the following field changes.

1. The size of trees to be planted in the wooded area was changed from 2.5 to 3 inches to a mix of 1.5 to 2.5 and 2.5 to 3 inches. Portions of the site have limited access and finished grades that make planting the larger 2.5 to 3 inch trees difficult, due to the larger root balls. This field change was approved by NYSDEC on November 12, 2014.

2. Approved by NYSDEC on November 12, 2014, the number of trees to be planted in the wooded area including habitat area UPF-2 was changed from 1,066 to 270 due to the following reasons:

    - Trees previously existing on the site and preserved were not taken into consideration in the number of trees proposed in the *2014 Revised RWP*;

    - The estimate for the quantity of trees in the *2014 Revised RWP* was based on a standard tree per acre density for planting a new forest plantation of seedlings in large open areas. Such plantations are managed by thinning every 10 to 15 years. In addition, large planting stocks, with a mix of 1.5 to 2.5 inch and 2.5 to 3 inch trees, are being used instead of seedlings, which were proposed to be used in the *2014 Revised RWP*. Therefore, the trees are being planted on 14 to 16 foot centers more closely resembling an older forest; and

    - The revised quantity of trees was also reduced to reflect the elongated shape of the habitat plots.

3. On May 20, 2015, a field change was approved by NYSDEC regarding a proposed method of controlling Phragmites. Activities related to this field change are discussed in Section 3.1.1.6 of this RMP.

4. On July 24, 2015, a field change was approved by NYSDEC regarding the approved plantings for habitats RIP and UPF-1. At that time, 23 Black Cherry trees had been planted in these two habitats (15 in RIP and 8 in UPF-1). While little to no mortality had been observed in the other plantings, the Black Cherry trees experienced an approximately 50 percent mortality rate. The nursery supplying the stock had been consulted, and they recommended not replacing these with new Black Cherry trees as they seem to not be well suited to these two habitats.

   In an effort to maintain the biodiversity of the plantings in RIP and UPF-1, it was proposed that the Black Cherry trees that were failing be replaced with other approved species which were already thriving at the site. The numbers reported below allow for replacement of all Black Cherry trees should that be needed.

   - RIP: Fifteen planted Black Cherry to be replaced with: four Red Maple; four Sugar Maple; four Pin Oak; and three Eastern Hemlock, and

   - UPF-1: Eight planted Black Cherry to be replaced with: two Sugar Maple, two American Beach, two White Pine, and two Eastern Hemlock.

5. On September 22, 2015, a field change was approved by NYSDEC that allowed the planting of low maintenance ground cover vegetation along the Bloody Brook Drainage District easement downstream of the wooded area between the top of the stone lined brook side bank and private properties that measure 4 feet or less in width. This field change was implemented at the request of OCDWEP in order to keep these areas easily accessible to Onondaga County personnel for brook maintenance. The field change specified that areas between the top of stone and the private property that measure 4 feet or greater in width be seeded with the previously approved grass seed mix and areas between the top of stone and the private property that measure 4 feet or less in width be seeded with annual rye (for temporary cover and soil stabilization) and selected low maintenance ground cover plants. Following the one year lifespan of the rye grass, the selected low maintenance ground cover vegetation, listed below, should be established.

   - Lowbush Blueberry (*Vaccinium angustifolium*)
   - Barren Strawberry (*Waldsteinia fragarioides*)
   - Three-Toothed Cinquefoil (*Sibbaldiopsis tridentata*)
   - Moss Phlox (*Phlox subulata*)
   - Horizontal Juniper (*Juniperus horizontalis*)

6. On September 22, 2015, NYSDEC approved a field change allowing the adaptive management in the palustrine shrub/scrub area adjacent to the NYS Thruway (PSS-1). The *2014 Revised RWP* called for a specific planting plan for PSS-1 to include: *Cornus amomum, Cephalanthus occidentalis, Sambucus canadensis, Alnus incana, and Aronia arbutifolia*. PSS-1 was completed and planted during fall 2014 and has since become established. In the interim, it was noted that the groundwater inflow to this area is more persistent than originally anticipated. To accommodate these conditions, a field change was implemented to allow for the introduction of several native obligate wetland species that will better tolerate the regular inundation of PSS-1. In support of the above management scope, the following plants:

- Silky Dogwood *(Cornus amomum)*
- Elderberry *(Sambucus Canadensis)*
- Speckled Alder *(Alnus incana)*
- Red Chokeberry *(Aronia arbutifolia)*

if deceased, were to be replaced with:

- Leatherleaf *(Chamaedaphne, calyculta)*
- Button Bush *(Cephalanthus occidentalis)*
- Smooth Alder *(Alnus serrulata)*
- Fetterbush *(Leucothoe racemose)*
- Silky Willow *(Salix Sericea)*
- Mountain Holly *(Nemopanthus mucronata)*

No more than 20 percent of any one of the above were to be used as replacement species to maintain biodiversity within PSS-1, and the plants were to be planted at the same density described in the *2014 Revised RWP*.

2.5 Vegetation Restoration Activities Following Annual Site Inspections

The first two annual restoration monitoring events were completed in late May 2017 and early June 2018 and resulted in additional plantings and adjusted boundaries for some of the habitat areas. The specific recommendations from each of the monitoring events are discussed in the corresponding *Restoration Monitoring Summary Report* (July 2017 and August 2018), and the resulting boundaries and locations of different planted trees and shrubs are shown in Figures 1 through 8 and summarized in Table 2 of this RMP.

3.0 Restoration Monitoring

3.1 Vegetation Monitoring

Vegetation monitoring for each area (i.e., wooded, residential, apartment complex, and commercial areas) will be completed as described below on an annual basis and will include an on-site inspection to be completed by a qualified person (e.g., biologist). Monitoring will continue for between one and five years, pursuant to approved work plans and property-specific access/restoration agreements between Lockheed Martin and the property owner. Section 5 below provides an anticipated schedule for this monitoring.

3.1.1 Wooded Area

The wooded area is comprised of three wetlands that are further divided into ten wetland habitat areas, two riparian areas, and six upland areas (Table 1 and Figure 1). Vegetation monitoring in the wooded area will be completed in accordance with the 2014 Revised RWP and the June 6, 2014 United States Army Corps of Engineers (USACE) Nationwide Permit (NWP) 38 to perform remediation activities in the WBBB and adjacent wetlands (USACE NWP 38). Monitoring in this area will be completed on an annual basis for five years. The information collected during the on-site inspection will be used to calculate the number of targeted plant species and the percent vegetation cover in the different habitat areas in order to assess the progression of development and natural sustainability of the wetlands and habitat areas. Target plant species include all planted shrubs and trees.

The site vegetation inspections will include inspections of the vegetative cover, trees, and shrubs for each of the wetland and upland habitat types. Figures 1 through 8 show the plantings for all of the habitat areas in the wooded area. The vegetative cover in these areas will be inspected to ensure that germination is occurring in all areas and that no large bare spots exist. The plot and transect procedures that will be used, in accordance with the 2014 Revised RWP and the January 1987 *Corps of Engineers Wetland Delineation Manual*, are described below.

Planted trees and shrubs will be counted and inspected to ensure they are developing, and dead trees and shrubs will be flagged. If the number of trees and shrubs is determined to be less than the target numbers as reported in Table 2 of this RMP, corrective measures will be proposed including tree and shrub replacements. Field forms for each of the habitat areas with planted trees and shrubs are provided in Attachment B. If determined necessary, tree and shrub species may be substituted for similar native species based on availability. Additionally, control measures will be implemented as discussed below in Section 3.1.1.6 if invasive species are present in any habitat area at a density greater than 5 percent.

Following each inspection, a summary report will be prepared and submitted to NYSDEC for approval detailing the extent of vegetation cover, target plant species survival, discussion of any issues, and proposed corrective actions, as needed. Section 5 of this RMP provides additional details on the summary reports.

3.1.1.1 Plot Procedure

The plot procedure will be conducted at eight locations within the emergent habitat areas. See Figure 1 for the plot locations. At each location, a 10-foot by 10-foot permanent plot was marked at the

corners with 1-inch PVC pipes extending at least 2 feet above the ground surface. Depending on the plant density in the plot, it may be divided into multiple subplots during counting to ease the counting process. The species within the plot will be identified to the extent practical. The estimated percent cover of foliage of each species of herbaceous or woody vegetation in the square will be recorded. The average percent cover for the entire plot will be calculated with bare ground included as a cover type. Photographs will be taken of each plot.

3.1.1.2 Transect Procedure

Permanent transects have been established across PSS-1, PSS-2, and PFO-1 as shown in the Figure 1. A spacing to provide 20 to 30 measuring points within each transect at the time of the inspection will be chosen (e.g., every four feet provided 26 points in the 100 foot PFO-1 transect). At each measuring point, the area of coverage for each species, with bare ground included as a cover type, will be determined and expressed as a percent coverage of the total transect area. Moving from the habitat edge, each tree and shrub that has a canopy extending into the 2-foot wide transect will be recorded. In addition, the approximate area of canopy (as projected on the ground) will be recorded. The data set will include a species frequency count, a coverage area for each individual, a total coverage (square feet) for each species, and a relative coverage as a percent cover. In PFO-1, trees and understory shrubs will be presented separately. Photos will also be taken of each transect.

3.1.1.3 Habitat Area Monitoring

PEM-1, PEM-2, PEM-3, PEM-4, PEM-5, W-10, and W-11 (Palustrine Emergent) – For these seven wetland areas containing primarily emergent plants, the plot procedure as described in the 2014 Revised RWP and above will be used to estimate percent cover. If vegetative cover does not appear to be approaching 80 percent during the annual monitoring events, corrective actions will be proposed.

PSS-1, PSS-2 (Palustrine Shrub/Scrub), and PFO-1 (Palustrine Forested) – For these three wetland areas, containing both trees and shrubs as well as wetland habitat seed mix, the transect procedure, as described in the 2014 Revised RWP and above will be used to estimate percent cover. Additionally, the habitat area will be walked, and any dead trees or shrubs will be flagged. A count of the live trees and shrubs in the areas will be compiled to calculate the number for the targeted species. Corrective measures will be proposed when the number of trees and shrubs is less than the target number, when invasive species are present at a density greater than 5 percent, or when vegetative cover does not appear to be approaching 80 percent in the particular habitat area.

UPF-1 and UPF-2 (Forested Upland) – For these two upland areas, containing both trees and shrubs as well as forested floor seed mix, the habitat area will be evaluated, and any dead trees or shrubs will be flagged for potential replacement. A count of the live trees and shrubs in the areas will be compiled for the targeted species. Corrective measures will be proposed if the number of trees and shrubs are determined to be below the target number as reported in Table 2 of this RMP, or when invasive species are present at a density greater than 5 percent.

To monitor the success of the seed mix, vegetation cover will be monitored in each habitat area by performing a walkthrough including a visual inspection. If the vegetative cover does not appear to be approaching 80 percent in a particular habitat area, corrective measures will be proposed to and approved by NYSDEC prior to being implemented.

RIP-1 and RIP-2 (Riparian) – For the riparian habitats, containing trees, shrubs, and a riparian habitat seed mix, the habitat area will be evaluated, and any dead trees or shrubs will be flagged for potential later replacement. A count of the live trees and shrubs in the areas will be compiled for the targeted species. Corrective measures will be proposed if the number of trees and shrubs are determined to be below the target number as reported in Table 2 of this RMP, or when invasive species are present at a density greater than 5 percent. Shrubs in these habitat areas were planted and surveyed in groups of three with each plant counted as an individual shrub.

To monitor the success of the seed mix, vegetation cover will be monitored by a walkthrough including a visual inspection. If the vegetative cover does not appear to be approaching 80 percent in a particular habitat area, corrective measures will be proposed to and approved by NYSDEC prior to being implemented.

RIP-2 comprises the land immediately adjacent to WBBB. Ideally, the edge of the stream should have sufficient cover to provide shade for the stream to maintain cooler temperatures, improving conditions for aquatic habitat. This has been accomplished within RIP-2 primarily through the planting of willow and dogwood live stakes. Existing large trees also provide shade to some parts of the stream banks in this area. Starting at the northern edge of the site at the Thruway fence line, the channel will be walked down to Weir 3. The vegetation and percentage cover will be monitored, and photos (facing downstream) will be taken approximately every 50 feet to document the vegetation cover and shade during the annual monitoring activities.

USS-1 (Shrub/Scrub Upland) - For the upland shrub/scrub habitat, containing shrubs and a forest floor habitat seed mix, the habitat area will be walked, and any dead shrubs will be flagged for later replacement. A count of the live shrubs in the areas will be compiled for the targeted species. Corrective measures will be proposed if the number of trees and shrubs are determined to be below the target number, or when invasive species are present at a density greater than 5 percent.

To monitor the success of the seed mix, vegetation cover will be evaluated by completing a walkthrough including a visual inspection. If the vegetative cover does not appear to be approaching 80 percent in a particular habitat area, corrective measures will be proposed to and approved by NYSDEC prior to being implemented.

MOW-1, MOW-2, and LAWN (Upland Meadow and Lawn) - For these areas, either an upland meadow or cool season lawn seed mix were used. Visual inspections will entail a walkthrough of the areas to confirm the seed mix was successful, and there are no large bare spots. If bare spots larger than 1 square foot are observed during monitoring, conditions in the area will be evaluated (e.g., multiple bare spots, soil compaction, etc.) to determine if corrective measures should be proposed.

3.1.1.4 Wetlands Groundwater and Surface Water Level Monitoring

During restoration activities in the wetland areas, three weirs were installed to allow for adjustment of the height of water retained in the wetlands (Figure 1). With NYSDEC approval, adjustments would be made, as needed, to improve the hydrology to support the different habitat types. During a 2015 high flow event, Weir 2 was damaged and required reconstruction. Following repairs, it was observed that conditions in the wetland behind the repaired weir were drier than anticipated. In May 2017, a field change was submitted to and approved by NYSDEC to permanently raise the height of Weir 2. These adjustments, completed in August 2017, raised the height of Weir 2 by 8 inches to lengthen the retention time of water and increase the water level in this wetland area and have effectively increased hydration of the wetland.

Shallow piezometers, installed in four locations at the edge of inundation in the constructed wetlands, will be used to monitor groundwater levels in the wetlands. Surface water will be monitored using four staff gauges installed in each of the three constructed wetlands. The approximate locations of the piezometers and staff gauges are shown on Figure 1.

3.1.1.5 Wetlands Photographic Monitoring

Progress in germination and growth of vegetation will be monitored using panoramic photographs from five permanent photo points established in uplands surrounding the constructed wetlands. The locations of the permanent photo points are shown in Figure 1.

3.1.1.6 Invasive Species Control

During construction activities, a Bloody Brook Phragmites Control Procedure was developed and approved by the NYSDEC to control the growth and spread of Phragmites adjacent to the restored wooded area of the site. In accordance with the procedure, Phragmites were removed in June 2015 and light-proof tarps were placed over the area. In spring 2017 (after about two years of the tarps remaining in place), the tarps were removed, and the previously covered areas were seeded with a PA New England Province riparian seed mix (i.e., ERNMX-253) (Attachment A) at a rate of 20 pounds per acre. Following application of the seed mix, the area has been monitored along with the adjacent restored portion of the wooded area as discussed in the previous sections.

Following implementation of the initial *Phragmites* control procedure, a standard operating procedure (SOP) for removal of invasive species was developed to further address control of *Phragmites* and to address the presence of other identified invasive species on the site, including purple loosestrife, Japanese knotweed, multiflora rose, honeysuckle, and buckthorn. This SOP is provided in Attachment C of this RMP.

3.1.2 Residential, Apartment Complex, and Commercial Areas

All residential, apartment complex, and commercial plantings will be visually inspected until they are successfully established for a period of between one and five years, in accordance with the property-specific access/restoration agreements between Lockheed Martin and the property owner. Plantings will be replaced as needed, with consideration for input from the property owner.

3.2 Erosion Monitoring

In accordance with the March 2014 Decision Document and the August 2014 Revised RWP, the site will be inspected for ponding on the side banks and for erosion of the brook bottom and side banks. Results from this inspection will be summarized in the Restoration Summary Report.

4.0 Vegetation Replacement

After each habitat area is inspected as described above, the habitat areas and dead trees and shrubs will be evaluated to determine replacement activities. The replacement activities will be summarized in the summary report, to be submitted to NYSDEC within 60 days of completing the monitoring. Replacements will be planted by the fall planting season, assuming stock availability and favorable site/weather conditions. If necessary, replacements will be made during the following spring planting season. Per the 2014 Revised RWP, some dead vegetation (including plant shrubs and trees) will be left as standing wood habitat, with the replacement tree being planted nearby.

An assessment of the species that had the highest success will be completed during each inspection, and replacement shrubs or trees, as needed, will be selected from those determined to be the most successful. If a tree or shrub species does not survive at acceptable rates, the cause of the high mortality rate will be evaluated. For example if a tree or shrub species has a low survival rate due to altered habitat conditions, replacement shrubs and trees will be selected based on the existing habitat conditions from the list of species already being planted at the site. If a native species not already being planted at the site is determined to be a better alternative, that alternative native species may be proposed to be planted at the site. Any replacement plantings needed at the site will be proposed to and approved by the NYSDEC prior to the corrective action being implemented. For example, if a species of tree or shrub has died due to inappropriate habitat conditions (e.g., too wet or too dry), the proposed replacement species will be based on a tree or shrub that is better adapted for survival in the existing habitat conditions. If the tree or shrub appears to have died for no particular reason, that tree or shrub will be replaced by the same species. This practice of replacement species was implemented with Field Changes approved on July 24, 2015 and September 22, 2015 as summarized in Section 2.4 of this RMP (numbers 4 and 6).

5.0 Restoration Monitoring Summary Reports and Proposed Schedule

Within 60 days after the monitoring event, a Restoration Monitoring Summary Report and Work Plan will be submitted to the NYSDEC that provides an assessment of the development of the wetlands and habitat area as well as tree and shrub survival. That document will include completed field forms; photographic documentation of observed vegetative and hydrological conditions; recommendations for replacement of planting as needed; and any activities proposed or completed to correct any restoration failures or issues discovered during the monitoring activities.

NYSDEC will be notified two weeks prior to these field activities. The schedule for these field activities and associated reports and corrective actions (if needed) are anticipated to occur annually for five years during the following months:

- May – annual monitoring event, weather permitting.
- July/August – Summary report and work plan submitted to NYSDEC for review.
- By October/November – implement proposed corrective actions including re-plantings, as determined in the summary report and work plan.

Figures

LEGEND

BLOODY BROOK DRAINAGE DISTRICT EASEMENT	
PROPERTY BORDER	
TOPOGRAPHIC CONTOUR LINE (PRE-EXCAVATION)	
PROPOSED BLOODY BROOK CENTERLINE	
STREAM/WATER EDGE	
UNDERGROUND DRAIN LINE	
OVERHEAD WIRES	
RETAINING WALL	
GUARD RAIL	
UTILITY MANHOLE	
DRAINAGE MANHOLE	
SANITARY MANHOLE	
RAILROAD TRACKS	
CATCH BASIN	
DRAINAGE STRUTURES	
FLAG POLE	
CULVERT	
E 924,000	NYS PLANE COORDINATE SYSTEM EASTING
N 1,131,000	NYS PLANE COORDINATE SYSTEM NORTHING
BL-115	AERIAL SURVEY GROUND CONTROL POINT
7+50	CHANNEL CENTERLINE SURVEY STATION
367.4	TOPOGRAPHIC SPOT ELEVATION
	CONIFEROUS TREE
	DECIDUOUS TREE
	LIGHT POLE
	UTILITY POLE / GUY WIRE
	WETLAND ELEVATION CONTROL WEIR LOCATION
	RIP RAP
	EXISTING WETLAND
PZ-1	WETLAND PIEZOMETER LOCATION
SG-1	WETLAND MONITORING STAFF GAUGE

PSS	PALUSTRINE SHRUB / SCRUB
PEM	PALUSTRINE EMERGENT
PFO	PALUSTRINE FORESTED
UPF	FORESTED UPLAND
USS	SHRUB / SCRUB UPLAND
MOW	UPLAND MEADOW
RIP	RIPARIAN
LAWN	LAWN
W	WETLAND
PHOTO-1	WETLAND MONITORING PHOTOGRAPH LOCATION (MULTIPLE VIEWS)

NOTES

1. THE WETLAND BOUNDARIES BASED ON THE MAY 2017 INSPECTION ARE SHOWN.

0' 50' 100'
APPROXIMATE SCALE

REFERENCES:

1. BASE MAP SOURCE: IANUZI & ROMANS, P.C. AND CT MALE ASSOCIATES P.C.

AECOM

LOCKHEED MARTIN CORPORATION

WETLAND HABITATS

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
2019 Plant Plan Rev 5.dwg	RNB	60572195	3 / 2019	1

Plotted By: carrie.szczepanski
Layout-Sheet Name: FIG 1_FULL SITE - NO PLANTS
Plot File Date Created: Mar/21/2019 1:52 PM

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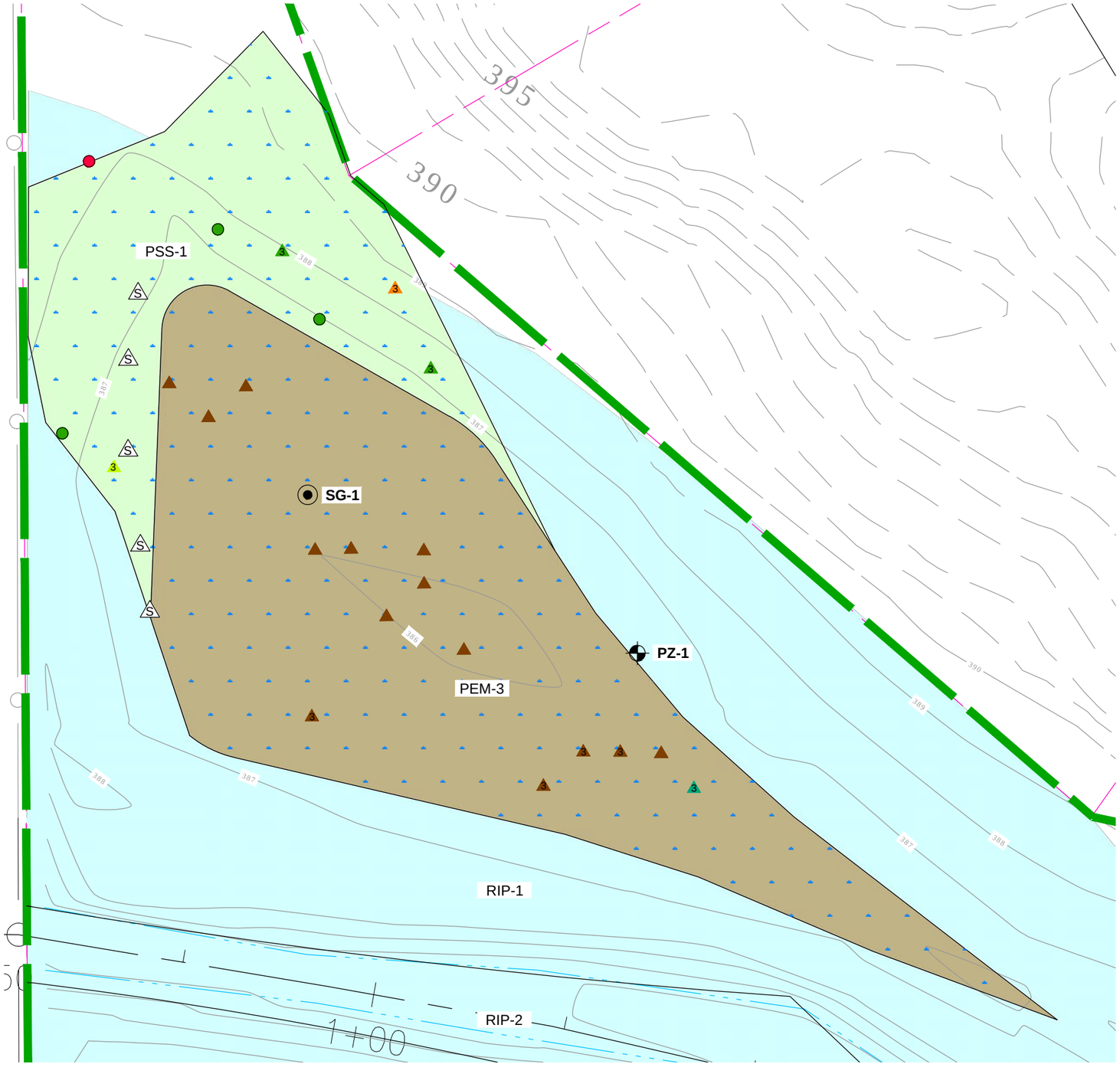

LEGEND

- PZ-1 — WETLAND PIEZOMETER LOCATION
- SG-1 — WETLAND MONITORING STAFF GAUGE
- PSS — PALUSTRINE SHRUB / SCRUB
- PEM — PALUSTRINE EMERGENT
- RIP — RIPARIAN
- EXISTING WETLAND

EXISTING TREES

- PIN OAK
- RED MAPLE

EXISTING SHRUBS

- BUTTONBUSH
- GREY DOGWOOD
- NANNYBERRY
- NORTHERN ARROWWOOD
- RED OSIER DOGWOOD
- STEEPLE BUSH (S)

PLANT STATUS BASED ON JUNE 2018 INSPECTION

- LIVING TREES
- STRESSED
- 3 — NUMBER OF LIVING SHRUBS

NOTES

1. THE WETLAND BOUNDARIES BASED ON THE MAY 2017 INSPECTION ARE SHOWN.
2. THE TRIANGLES REPRESENTING PLANTED SHRUBS INDICATE ONE LIVE SHRUB OF THAT SPECIES COUNTED AT THAT LOCATION DURING THE 2018 MONITORING EVENT, UNLESS OTHERWISE NOTED.
3. THE SHRUBS WITHIN PEM-3 WERE PLANTED PRIOR TO THIS AREA BEING DESIGNATED AS AN EMERGENT WETLAND DUE TO WETTER CONDITIONS AND THE ADAPTIVE MANAGEMENT APPROACH.

0’ 15’ 30’

AECOM

LOCKHEED MARTIN CORPORATION

PLANTING LOCATIONS FOR PSS-1 AND PEM-3

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE
2019 Plant Plan rev 5.dwg	RNB	60572195	3 / 2019	2

Plotted By: carrie.szczepanski
Layout–Sheet Name: FIG 2_PLANTING PLAN PSS-1
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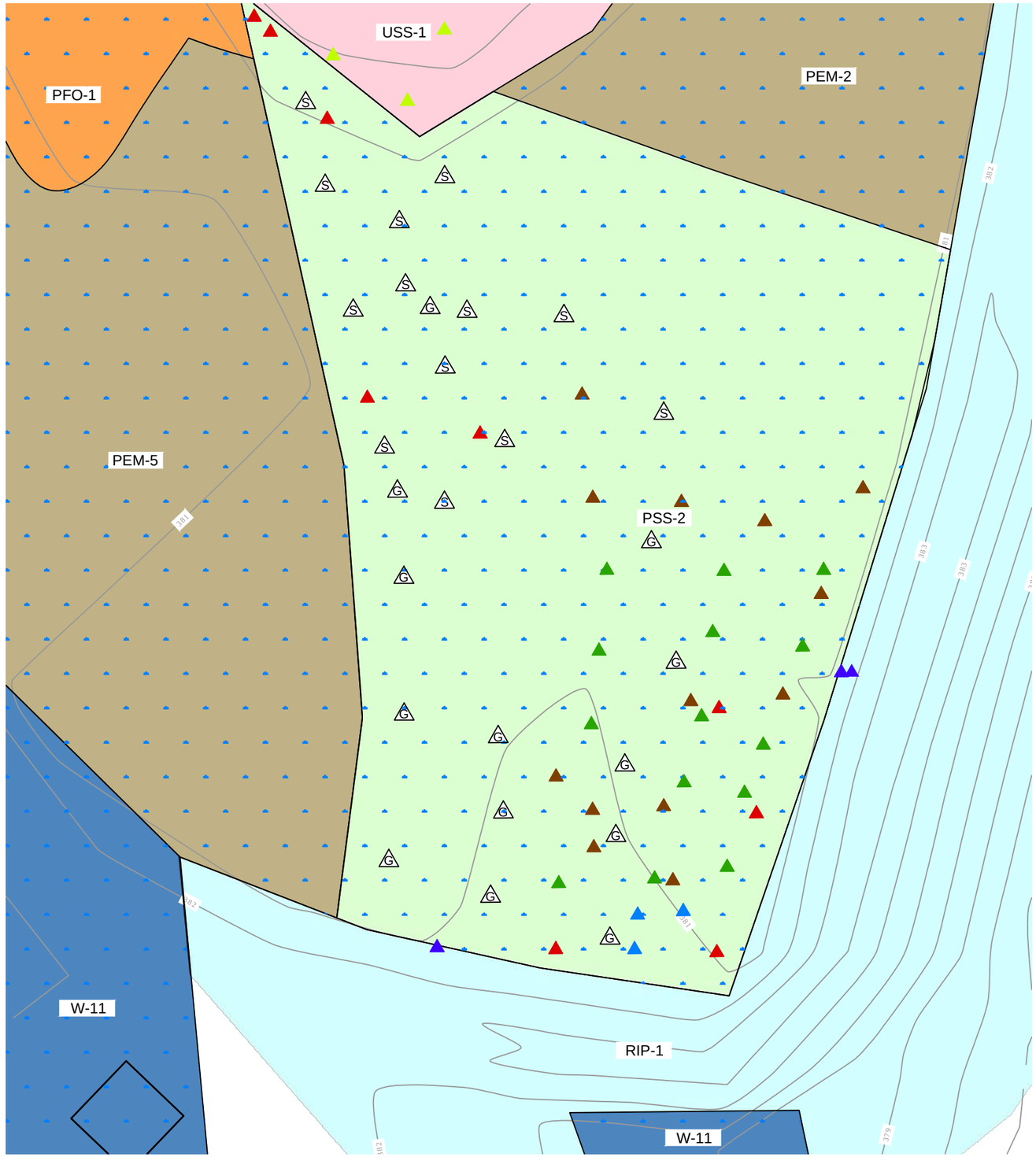

LEGEND

PSS	PALUSTRINE SHRUB / SCRUB
PEM	PALUSTRINE EMERGENT
PFO	PALUSTRINE FORESTED
USS	SHRUB / SCRUB UPLAND
RIP	RIPARIAN
W	WETLAND
	EXISTING WETLAND

EXISTING SHRUBS

- BUTTONBUSH
- ELDERBERRY
- RED CHOKEBERRY
- SANDBAR WILLOW
- NORTHERN ARROWWOOD
- STEEPLE BUSH (S)
- SWEET GALE (G)

NOTES

1. THE WETLAND BOUNDARIES BASED ON THE MAY 2017 INSPECTION ARE SHOWN.

0’ 15’ 30’

AECOM

LOCKHEED MARTIN CORPORATION

PLANTING LOCATIONS FOR PSS-2

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE
2019 Plant Plan rev 5.dwg	RNB	60572195	3 / 2019	3

Plotted By: carrie.szczepanski
Layout–Sheet Name: FIG 3_PLANTING PLAN PSS-2
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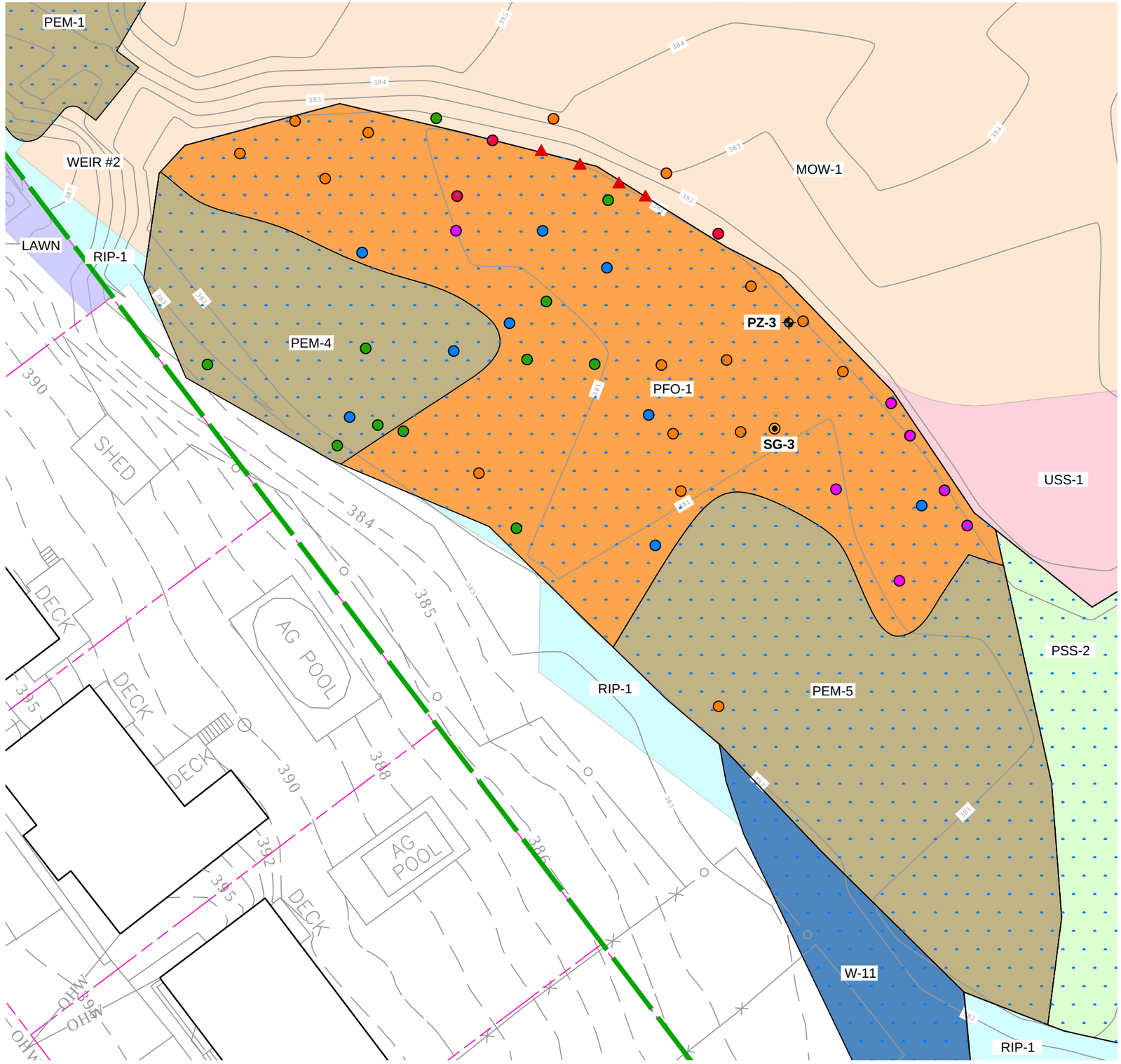

LEGEND

- PZ-3 — WETLAND PIEZOMETER LOCATION
- SG-3 — WETLAND MONITORING STAFF GAUGE
- PSS — PALUSTRINE SHRUB / SCRUB
- PEM — PALUSTRINE EMERGENT
- PFO — PALUSTRINE FORESTED
- USS — SHRUB / SCRUB UPLAND
- MOW — UPLAND MEADOW
- RIP — RIPARIAN
- LAWN — LAWN
- W — WETLAND
- EXISTING WETLAND

EXISTING TREES

- BLACK WILLOW
- PIN OAK
- RED MAPLE
- RIVER BIRCH
- SWAMP WHITE OAK

SHRUBS

- ELDERBERRY

PLANT STATUS BASED ON JUNE 2018 INSPECTION

- LIVING TREES
- STRESSED

NOTES

1. THE WETLAND BOUNDARIES BASED ON THE MAY 2017 INSPECTION ARE SHOWN.
2. THE TREES WITHIN PEM-4 AND PEM-5 WERE PLANTED PRIOR TO THESE AREAS BEING DESIGNATED AS EMERGENT WETLANDS DUE TO WETTER CONDITIONS AND THE ADAPTIVE MANAGEMENT APPROACH.

0’ 25’ 50’

AECOM

LOCKHEED MARTIN CORPORATION

PLANTING LOCATIONS FOR PFO-1

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE
2019 Plant Plan rev 5.dwg	RNB	60572195	3 / 2019	4

Plotted By: carrie.szczepanski
Layout-Sheet Name: FIG 4_PLANTING PLAN PFO-1
Plot File Date Created: 10:48 AM 3/22/2019

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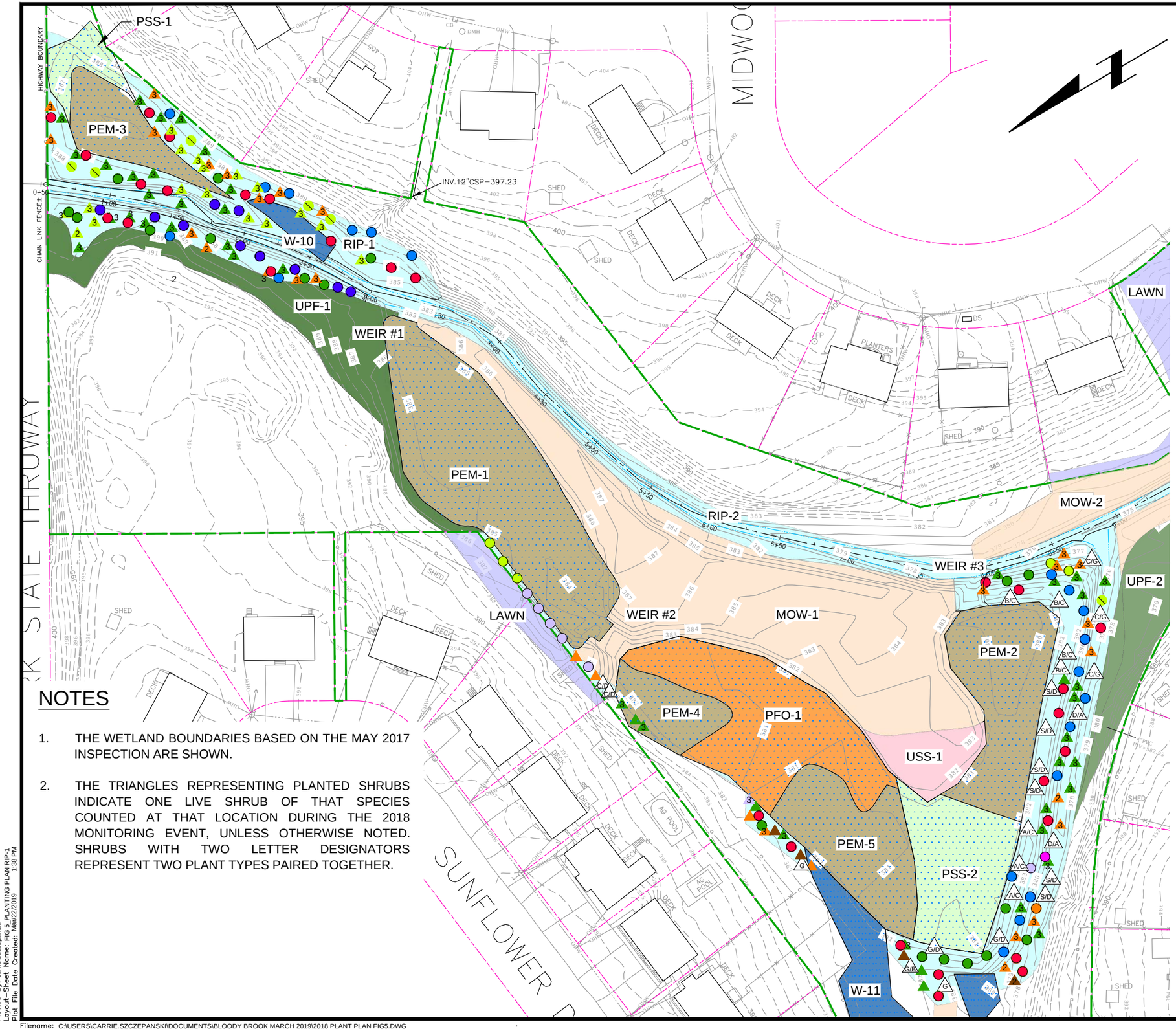


NOTES

1. THE WETLAND BOUNDARIES BASED ON THE MAY 2017 INSPECTION ARE SHOWN.

2. THE TRIANGLES REPRESENTING PLANTED SHRUBS INDICATE ONE LIVE SHRUB OF THAT SPECIES COUNTED AT THAT LOCATION DURING THE 2018 MONITORING EVENT, UNLESS OTHERWISE NOTED. SHRUBS WITH TWO LETTER DESIGNATORS REPRESENT TWO PLANT TYPES PAIRED TOGETHER.

LEGEND

PSS	PALUSTRINE SHRUB / SCRUB		
PEM	PALUSTRINE EMERGENT		
PFO	PALUSTRINE FORESTED		
UPF	FORESTED UPLAND		
USS	SHRUB / SCRUB UPLAND	RIP	RIPARIAN
MOW	UPLAND MEADOW	LAWN	LAWN
	EXISTING WETLAND	W	WETLAND

EXISTING TREES

	BLACK WILLOW		SILVER MAPLE
	EASTERN HEMLOCK		SUGAR MAPLE
	PIN OAK		SWAMP WHITE OAK
	RED MAPLE		WHITE PINE

EXISTING SHRUBS

- BUTTON BUSH
- GREY DOGWOOD
- NANNYBERRY
- NORTHERN ARROWWOOD
- SPECKLED ALDER
- C — HIGH BUSH CRANBERRY
- G — SWEET GALE
- B/C — BUTTON BUSH/HIGH BUSH CRANBERRY
- D/A — GREY DOGWOOD/SPECKLED ALDER
- C/D — HIGH BUSH CRANBERRY/GREY DOGWOOD
- C/G — HIGH BUSH CRANBERRY/SWEET GALE
- A/C — SPECKLED ALDER/HIGH BUSH CRANBERRY
- G/D — SWEET GALE/GREY DOGWOOD
- S/D — STEEPLE BUSH/GREY DOGWOOD
- G/B — SWEET GALE/BUTTON BUSH

PLANT STATUS BASED ON JUNE 2018 INSPECTION

- ○ LIVING TREES
- \ STRESSED
- 3 NUMBER OF LIVING SHRUBS

0’ 70’ 140’

AECOM

LOCKHEED MARTIN CORPORATION

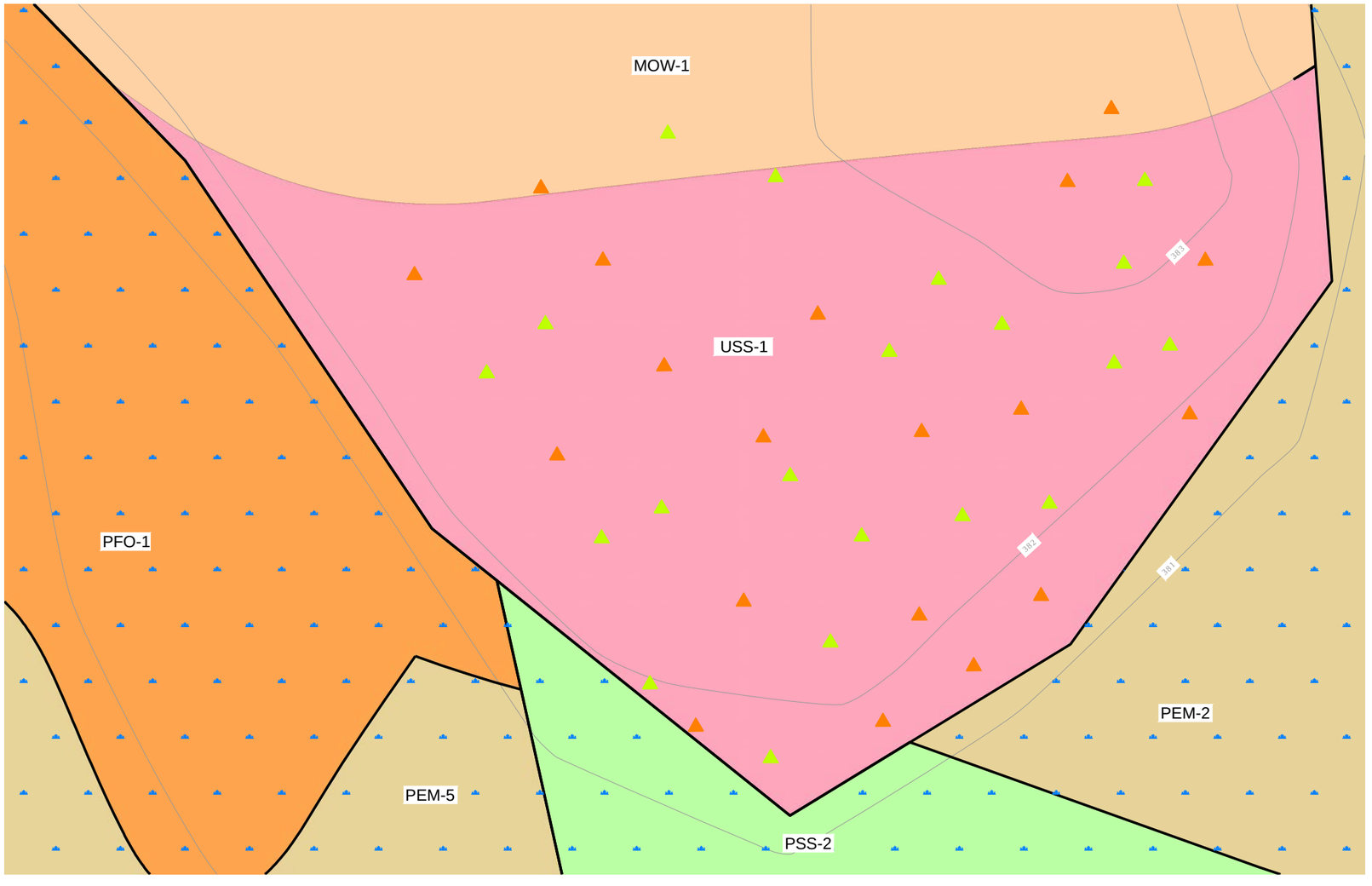
PLANTING LOCATIONS FOR RIP-1

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE
2018 Plant Plan Fig5.dwg	RNB	60540930	3 / 2019	5

Plotted By: carrie.szczepanski
Layout–Sheet Name: FIG 5_PLANTING PLAN RIP-1
Plot File Date Created: Mar/22/2019 1:38 PM

Filename: C:\USERS\CARRIE.SZCZEPANSKI\DOCUMENTS\BLOODY BROOK MARCH 2019\2018 PLANT PLAN FIG5.DWG



LEGEND

PSS	PALUSTRINE SHRUB / SCRUB
PEM	PALUSTRINE EMERGENT
PFO	PALUSTRINE FORESTED
USS	SHRUB / SCRUB UPLAND
MOW	UPLAND MEADOW
	EXISTING WETLAND

EXISTING SHRUBS

- GREY DOGWOOD
- NANNYBERRY

NOTES

1. THE WETLAND BOUNDARIES BASED ON THE MAY 2017 INSPECTION ARE SHOWN.

0' 10' 20'

AECOM

LOCKHEED MARTIN CORPORATION

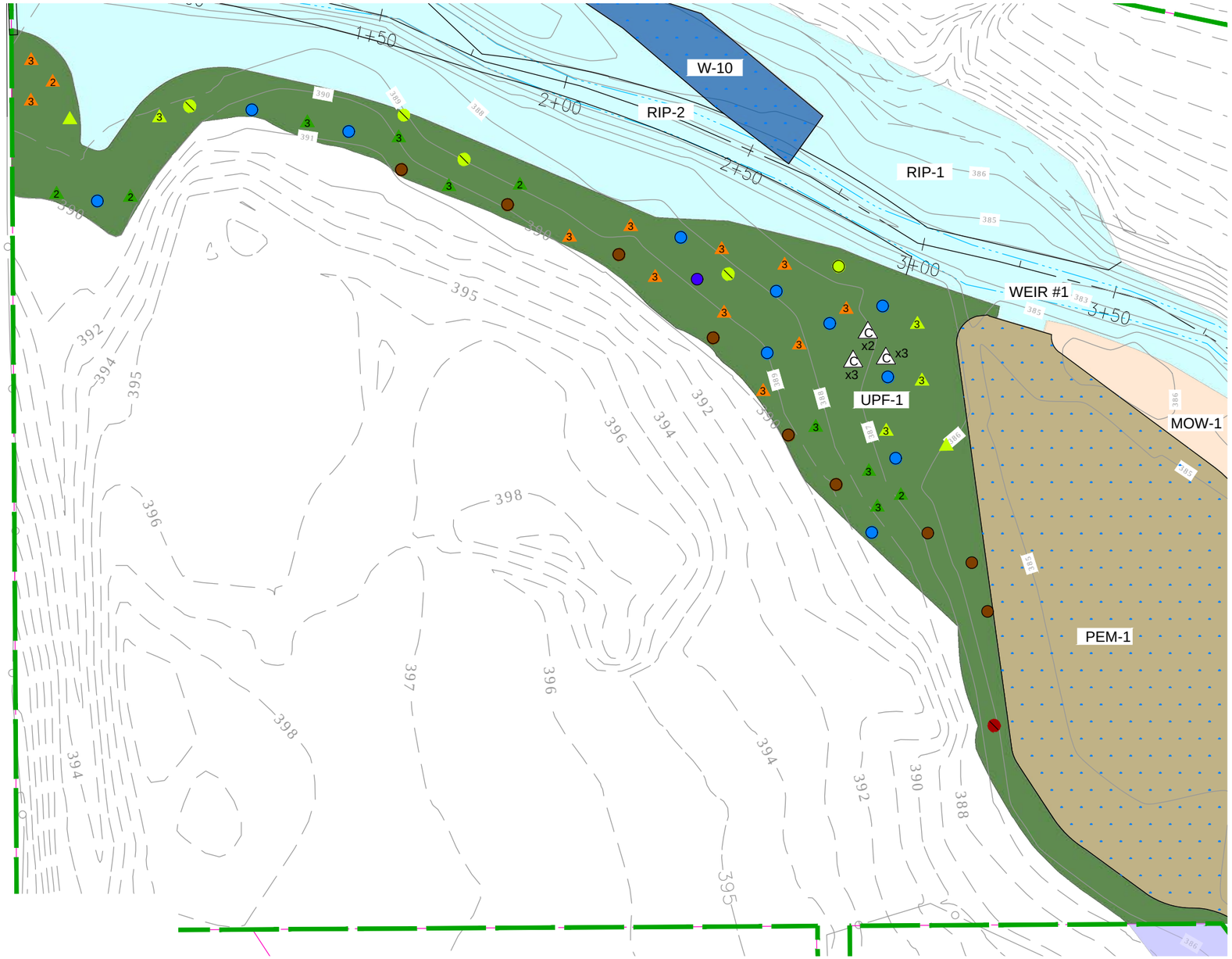
PLANTING LOCATIONS FOR USS-1

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE
2019 Plant Plan rev 5.dwg	RNB	60540930	3 / 2019	6

Plotted By: carrie.szczepanski
Layout–Sheet Name: FIG 6_PLANTING PLAN USS-1
Plot File Date Created: Mar/21/2019 2:07 PM

Filename: C:\USERS\CARRIE.SZCZEPANSKI\DOCUMENTS\BLOODY BROOK MARCH 2019\2019 PLANT PLAN REV 5.DWG



LEGEND

PEM	PALUSTRINE EMERGENT
UPF	FORESTED UPLAND
MOW	UPLAND MEADOW
RIP	RIPARIAN
W	WETLAND
	EXISTING WETLAND

EXISTING TREES

- AMERICAN BEECH
- BLACK CHERRY
- EASTERN HEMLOCK
- SILVER MAPLE
- SUGAR MAPLE

EXISTING SHRUBS

- GREY DOGWOOD
- NANNYBERRY
- NORTHERN ARROWWOOD
- C HIGHBUSH CRANBERRY

PLANT STATUS BASED ON JUNE 2018 INSPECTION

- ○ LIVING TREES
- \ STRESSED
- 3 NUMBER OF LIVING SHRUBS

NOTES

1. THE WETLAND BOUNDARIES BASED ON THE MAY 2017 INSPECTION ARE SHOWN.
2. THE TRIANGLES REPRESENTING PLANTED SHRUBS INDICATE ONE LIVE SHRUB OF THAT SPECIES COUNTED AT THAT LOCATION DURING THE 2018 MONITORING EVENT, UNLESS OTHERWISE NOTED.

0’ 15’ 30’ 60’

AECOM

LOCKHEED MARTIN CORPORATION

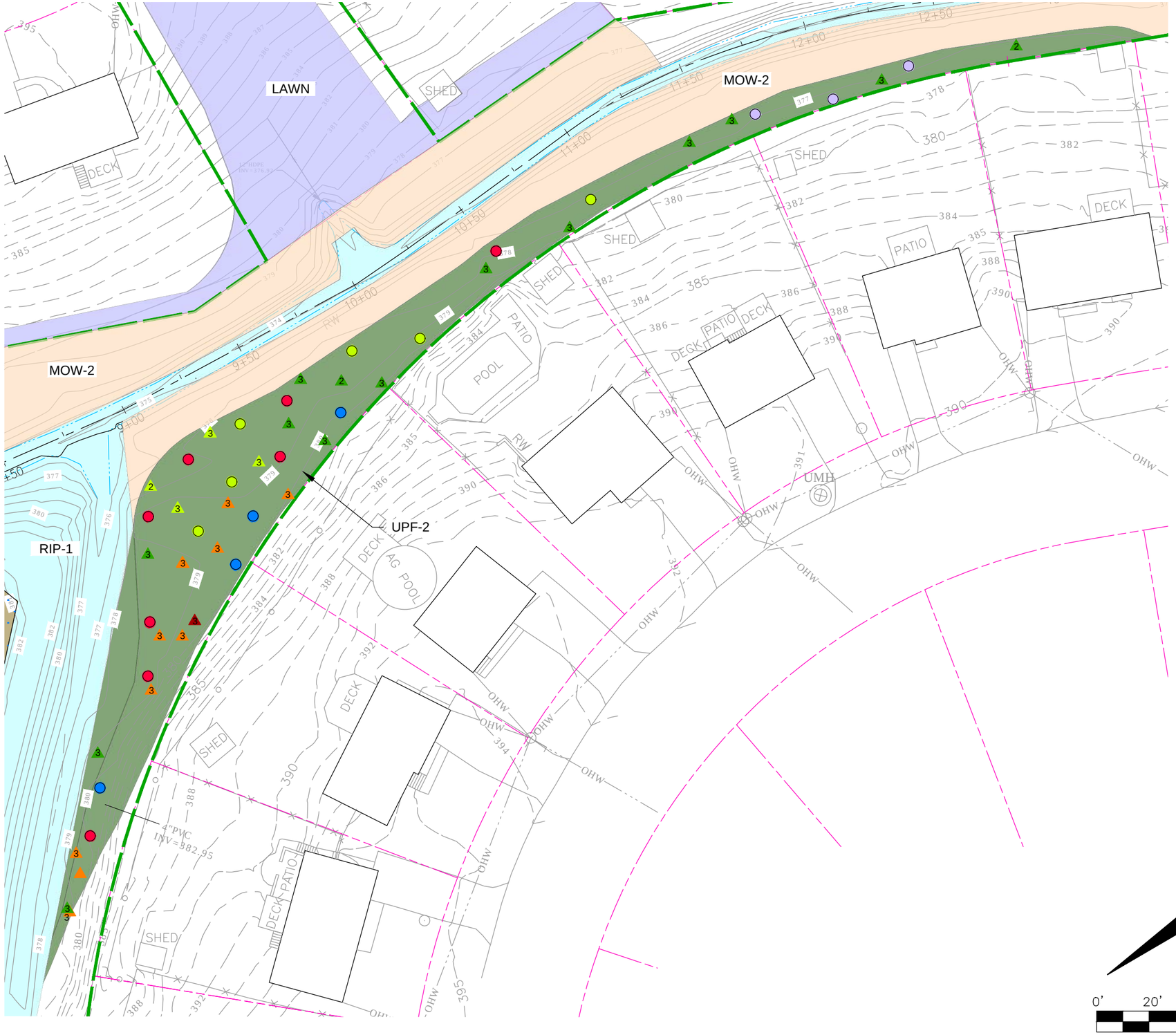
PLANTING LOCATIONS FOR UPF-1

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE
2019 Plant Plan rev 5.dwg	RNB	60572195	3 / 2019	7

Plotted By: carrie.szczepanski
Layout--Sheet Name: FIG 7_PLANTING PLAN UPF-1
Plot File Date Created: Mar/22/2019 1:33 PM

Filename: C:\USERS\CARRIE.SZCZEPANSKI\DOCUMENTS\BLOODY BROOK MARCH 2019\2019 PLANT PLAN REV 5.DWG



LEGEND

- UPF — FORESTED UPLAND
- MOW — UPLAND MEADOW
- RIP — RIPARIAN
- LAWN — LAWN
- EXISTING WETLAND

EXISTING TREES

- EASTERN HEMLOCK
- RED MAPLE
- SUGAR MAPLE
- WHITE PINE

EXISTING SHRUBS

- ELDERBERRY
- GREY DOGWOOD
- NANNYBERRY
- NORTHERN ARROWWOOD

PLANT STATUS BASED ON JUNE 2018 INSPECTION

- LIVING TREES
- STRESSED
- 3 — NUMBER OF LIVING SHRUBS

NOTES

1. THE WETLAND BOUNDARIES BASED ON THE MAY 2017 INSPECTION ARE SHOWN.
2. THE TRIANGLES REPRESENTING PLANTED SHRUBS INDICATE ONE LIVE SHRUB OF THAT SPECIES COUNTED AT THAT LOCATION DURING THE 2018 MONITORING EVENT, UNLESS OTHERWISE NOTED.

0’ 20’ 40’ 80’

AECOM

LOCKHEED MARTIN CORPORATION

PLANTING LOCATIONS FOR UPF-2

BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE
2019 Plant Plan rev 5.dwg	RNB	60572195	3 / 2019	8

Plotted By: carrie.szczepanski
Layout–Sheet Name: FIG 8_PLANTING PLAN UPF-2
Plot File Date Created: Mar/22/2019 1:35 PM

Filename: C:\USERS\CARRIE.SZCZEPANSKI\DOCUMENTS\BLOODY BROOK MARCH 2019\2019 PLANT PLAN REV 5.DWG

Tables

Table 1. Restored Wooded and Wetland Habitat Types

Habitat Type	Habitat ID*	Acreage	Quantitative measure*
Palustrine Emergent	PEM-1	0.38	Plot 1 and Plot 2
	PEM-2	0.19	Plot 3
	PEM-3	0.08	Plot 4
	PEM-4	0.07	Plot 5
	PEM-5	0.16	Plot 6
	W-10	0.02	Plot 7
	W-11	0.23	Plot 8
Palustrine Shrub/Scrub	PSS-1	0.04	PSS Transect 1
	PSS-2	0.16	PSS Transect 2
			Number of planted trees/shrubs / Survival Rate
Palustrine Forested	PFO-1	0.25	PFO Transect 1
			Number of planted trees/shrubs / Survival Rate
Riparian	RIP-1	0.72	Number of planted trees/shrubs / Survival Rate
Shrub/Scrub Upland	USS-1	0.08	Number of planted trees/shrubs / Survival Rate
Forested Upland	UPF-1	0.2	Number of planted trees/shrubs / Survival Rate
	UPF-2	0.26	
Upland Meadow and Lawn	MOW-1		Only qualitative measure used – visual inspection of ground cover.
	MOW-2		
	LAWN		

Note:

* See Figure 1 for habitat, plot, and transect locations.

Table 2. Target Tree and Shrub Counts from June 2018 Monitoring Event

Wetland Habitat Area	Area (square feet)	Total Number of Target Trees/Shrubs[1]	Species	Total Number of Target Trees/Shrubs Counted during 2018 Monitoring
PSS-1 Trees	1,726	4		4
			Pin Oak	3
			Red Maple	1
PSS-1 Shrubs	1,726	17		17
			Grey Dogwood	3
			Nannyberry	3
			Northern Arrowwood	6
			Steeplebush	5
PSS-2 Shrubs	6,940	69		68
			Sandbar Willow	3
			Spicebush	0
			Elderberry	9
			Red Chokeberry	3
			Buttonbush	13
			Steeplebush	13
			Sweet Gale	13
			Northern Arrowwood	14
PFO-1 Trees	10,817	33		37
			Red Maple	3
			Pin Oak	7
			Black Willow	13
			River Birch	7
			Swamp White Oak	7
PFO-1 Shrubs	10,817	4		4
			Elderberry	4
RIP-1 Trees	31,515	96		96
			Red Maple	29
			Sugar Maple	20
			Pin Oak	18
			Eastern Hemlock	11
			White Pine	6
			Swamp White Oak	1
			Black Willow	1
			Silver Maple	10
RIP-1 Shrubs	31,515	314		313
			Northern Arrowwood	128
			Nannyberry	50
			Grey Dogwood	91
			Highbush Cranberry	12
			Steeplebush	6
			Sweet Gale	8
			Buttonbush	10
			Speckled Alder	8
USS-1 Shrubs	3,291	39		39
			Grey Dogwood	19
			Nannyberry	20
UPF-1 Trees	8,675	26		27
			Sugar Maple	11
			American Beech	9
			Black Cherry	1
			Silver Maple	1
			Eastern Hemlock	5
UPF-1 Shrubs	8,675	86		83
			Northern Arrowwood	26
			Nannyberry	14
			Grey Dogwood	35
			Highbush Cranberry	8
UPF-2 (Woodland) Trees	11,300	21		21
			Sugar Maple	4
			White Pine	3
			Red Maple	8
			Eastern Hemlock	6
UPF-2 (Woodland) Shrubs	11,300	83		82
			Northern Arrowwood	40
			Grey Dogwood	28
			Nannyberry	11
			Elderberry	3

Notes:

1) Target trees and shrubs refer to the trees and shrubs planted in accordance with NYSDEC approved restoration activities.

2) This table includes only the habitat areas where target trees and shrubs are counted as part of the monitoring process. The habitat areas not included are inspected using other quantitative techniques as discussed in Section 3 of this Restoration Monitoring Plan.

Attachment A

Seed Mixtures

PA New England Province Riparian Mix

ERNMX # ERNMX-253
Seeding Rate Approximately 20 lb per acre
Mix Type Wet Meadow & Wetland Sites

- 14% Little Bluestem, Fort Indiantown Gap-PA Ecotype (Schizachyrium scoparium, Fort Indiantown Gap-PA Ecotype)
- 14% Indiangrass, PA Ecotype (Sorghastrum nutans, PA Ecotype)
- 10% Riverbank Wildrye, PA Ecotype (Elymus riparius, PA Ecotype)
- 10% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype)
- 9% Deertongue, 'Tioga' (Panicum clandestinum (Dichanthelium c.), 'Tioga')
- 8% Big Bluestem, 'Niagara' (Andropogon gerardii, 'Niagara')
- 7% Fox Sedge, PA Ecotype (Carex vulpinoidea, PA Ecotype)
- 2% Switchgrass, 'Shelter' (Panicum virgatum, 'Shelter')
- 2% Boneset, PA Ecotype (Eupatorium perfoliatum, PA Ecotype)
- 2% Soft Rush (Juncus effusus)
- 2% Swamp Milkweed, PA Ecotype (Asclepias incarnata, PA Ecotype)
- 2% Autumn Bentgrass, PA Ecotype (Agrostis perennans, PA Ecotype)
- 2% Wild Senna, VA & WV Ecotype (Senna hebecarpa (Cassia h.), VA & WV Ecotype)
- 2% Oxeye Sunflower, PA Ecotype (Heliopsis helianthoides, PA Ecotype)
- 2% Blue Vervain, PA Ecotype (Verbena hastata, PA Ecotype)
- 2% Partridge Pea, PA Ecotype (Chamaecrista fasciculata (Cassia f.), PA Ecotype)
- 1% Wild Bergamot, PA Ecotype (Monarda fistulosa, PA Ecotype)
- 1% Redtop Panicgrass, PA Ecotype (Panicum rigidulum (P. stipitatum), PA Ecotype)
- 1% Joe Pye Weed, PA Ecotype (Eupatorium fistulosum, PA Ecotype)
- 1% Flat Topped White Aster, PA Ecotype (Aster umbellatus (Doellingeria umbellata), PA Ecotype)
- 1% Purplestem Aster, PA Ecotype (Aster puniceus (Symphyotrichum puniceum), PA Ecotype)
- 1% Zigzag Aster, PA Ecotype (Aster prenanthoides (Symphyotrichum p.), PA Ecotype)
- 1% New England Aster (Aster novae-angliae (Symphyotrichum n.))
- 1% New York Ironweed, PA Ecotype (Vernonia noveboracensis, PA Ecotype)
- 1% Many Leaved Bulrush, PA Ecotype (Scirpus polyphyllus, PA Ecotype)
- 1% Spotted Joe Pye Weed, PA Ecotype (Eupatorium maculatum (Eupatoriadelphus maculatus), PA Ecotype)

Total: 100%

Northeastern U.S. Roadside Native Mix

ERNMX # ERNMX-105
Seeding Rate Approximately 20 lb per acre, or 1/2 lb per 1,000 sq ft
Mix Type Upland & Meadow Sites

- 24% Big Bluestem, 'Prairie View'-IN Ecotype (Andropogon gerardii, 'Prairie View'-IN Ecotype)
- 20% Sideoats Grama, 'Butte' (Bouteloua curtipendula, 'Butte')
- 19% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype)
- 5% Broomsedge, MO Ecotype (Andropogon virginicus, MO Ecotype)
- 5% Blackeyed Susan, Coastal Plain NC Ecotype (Rudbeckia hirta, Coastal Plain NC Ecotype)
- 4% Partridge Pea, PA Ecotype (Chamaecrista fasciculata (Cassia f.), PA Ecotype)
- 4% Purple Coneflower (Echinacea purpurea)
- 3% Ohio Spiderwort, PA Ecotype (Tradescantia ohiensis, PA Ecotype)
- 2% Swamp Milkweed, PA Ecotype (Asclepias incarnata, PA Ecotype)
- 2% Wild Senna, VA & WV Ecotype (Senna hebecarpa (Cassia h.), VA & WV Ecotype)
- 2% Oxeye Sunflower, PA Ecotype (Heliopsis helianthoides, PA Ecotype)
- 2% Zigzag Aster, PA Ecotype (Aster prenanthoides (Symphyotrichum p.), PA Ecotype)
- 2% Blue False Indigo, Southern WV Ecotype (Baptisia australis, Southern WV Ecotype)
- 2% Flat Topped White Aster, PA Ecotype (Aster umbellatus (Doellingeria umbellata), PA Ecotype)
- 1% Wild Bergamot, PA Ecotype (Monarda fistulosa, PA Ecotype)
- 1% Early Goldenrod, PA Ecotype (Solidago juncea, PA Ecotype)
- 1% New England Aster, PA Ecotype (Aster novae-angliae (Symphyotrichum n.), PA Ecotype)
- 1% Marsh (Dense) Blazing Star (Spiked Gayfeather), PA Ecotype (Liatris spicata, PA Ecotype)

Total: 100%

PA New England Province FACW Mix

ERNMX # ERNMX-251

Seeding Rate Approximately 20 lb per acre

Mix Type Wet Meadow & Wetland Sites

- 24% Fox Sedge, PA Ecotype (Carex vulpinoidea, PA Ecotype)
- 20% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype)
- 10% Lurid (Shallow) Sedge, PA Ecotype (Carex lurida, PA Ecotype)
- 5% Hop Sedge, PA Ecotype (Carex lupulina, PA Ecotype)
- 4% Blue Vervain, PA Ecotype (Verbena hastata, PA Ecotype)
- 3% Green Bulrush, PA Ecotype (Scirpus atrovirens, PA Ecotype)
- 3% Soft Rush (Juncus effusus)
- 2% Swamp Milkweed, PA Ecotype (Asclepias incarnata, PA Ecotype)
- 2% Wood Reedgrass, PA Ecotype (Cinna arundinacea, PA Ecotype)
- 2% Boneset, PA Ecotype (Eupatorium perfoliatum, PA Ecotype)
- 2% Cosmos (Bristly) Sedge, PA Ecotype (Carex comosa, PA Ecotype)
- 2% Oxeye Sunflower, PA Ecotype (Heliopsis helianthoides, PA Ecotype)
- 2% Redtop Panicgrass, PA Ecotype (Panicum rigidulum (P. stipitatum), PA Ecotype)
- 2% Sensitive Fern (Onoclea sensibilis)
- 1% Joe Pye Weed, PA Ecotype (Eupatorium fistulosum, PA Ecotype)
- 1% Pennsylvania Smartweed, PA Ecotype (Polygonum pensylvanicum, PA Ecotype)
- 1% Spotted Joe Pye Weed, PA Ecotype (Eupatorium maculatum (Eupatoriadelphus maculatus), PA Ecotype)
- 1% Northern Long Sedge, PA Ecotype (Carex folliculata, PA Ecotype)
- 1% Slender Mountainmint (Pycnanthemum tenuifolium)
- 1% Flat Topped White Aster, PA Ecotype (Aster umbellatus (Doellingeria umbellata), PA Ecotype)
- 1% Bladder (Star) Sedge, PA Ecotype (Carex intumescens, PA Ecotype)
- 1% Rattlesnake Grass, PA Ecotype (Glyceria canadensis, PA Ecotype)
- 1% Many Leaved Bulrush, PA Ecotype (Scirpus polyphyllus, PA Ecotype)
- 1% Great Blue Lobelia, PA Ecotype (Lobelia siphilitica, PA Ecotype)
- 1% New York Ironweed, PA Ecotype (Vernonia noveboracensis, PA Ecotype)
- 1% Narrowleaf Blue Eyed Grass (Sisyrinchium angustifolium)
- 1% Brown Bulrush, PA Ecotype (Scirpus pendulus, PA Ecotype)
- 1% New England Aster (Aster novae-angliae (Symphyotrichum n.))
- 1% Zigzag Aster, PA Ecotype (Aster prenanthoides (Symphyotrichum p.), PA Ecotype)
- 1% Purplestem Aster, PA Ecotype (Aster puniceus (Symphyotrichum puniceum), PA Ecotype)
- 1% Square Stemmed Monkeyflower, PA Ecotype (Mimulus ringens, PA Ecotype)

Total: 100%

Partially Shaded Area Roadside Mix

ERNMX # ERNMX-140

Seeding Rate Approximately 20 lb per acre, or 1/2 lb per 1,000 sq ft

Mix Type Woodland Openings, Partially Shaded Sites & Shrubby Sites Associated with Bioengineering

- 20% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype)
- 17% Creeping Red Fescue (Festuca rubra)
- 17% Deertongue, 'Tioga' (Panicum clandestinum (Dichanthelium c.), 'Tioga')
- 10% Autumn Bentgrass, Albany Pine Bush-NY Ecotype (Agrostis perennans, Albany Pine Bush-NY Ecotype)
- 6% Tall White Beardtongue (Penstemon digitalis)
- 5% Partridge Pea, PA Ecotype (Chamaecrista fasciculata (Cassia f.), PA Ecotype)
- 4% Purple Coneflower (Echinacea purpurea)
- 4% Zigzag Aster, PA Ecotype (Aster prenanthoides (Symphyotrichum p.), PA Ecotype)
- 4% Blackeyed Susan, Coastal Plain NC Ecotype (Rudbeckia hirta, Coastal Plain NC Ecotype)
- 3% Marsh (Dense) Blazing Star (Spiked Gayfeather), PA Ecotype (Liatris spicata, PA Ecotype)
- 3% Ohio Spiderwort, PA Ecotype (Tradescantia ohiensis, PA Ecotype)
- 2% Thimbleweed, PA Ecotype (Anemone virginiana, PA Ecotype)
- 2% Oxeye Sunflower, PA Ecotype (Heliopsis helianthoides, PA Ecotype)
- 1% Blue False Indigo, Southern WV Ecotype (Baptisia australis, Southern WV Ecotype)
- 1% Wild Bergamot, PA Ecotype (Monarda fistulosa, PA Ecotype)
- 1% Slender Bushclover, VA Ecotype (Lespedeza virginica, VA Ecotype)

Total: 100%

Attachment B

Vegetation Field Monitoring Forms for Habitat Areas

Post-Remediation Vegetation Monitoring
West Branch of Bloody Brook - (WBBB)
Onondaga, New York

Habitat Area: RIP-1

Date: _____

Weather: _____ **Inspector(s):** _____

Planting Type	Species	Common Name	Number Proposed	Number Planted	Number Survived	Comments/Notes
Tree	*Acer rubrum*	Red maple				
Tree	*Acer saccharum*	Sugar maple				
Tree	*Fagus grandifolia*	American beech				
Tree	*Quercus palustris*	Pin oak				
Tree	*Tsuga canadensis*	Eastern hemlock				
Tree	*Prunus serotina*	Black cherry				
Tree	*Pinus strobus*	White pine				
Total # Trees						
Shrub	*Viburnum dentatum*	Northern arrowwood				
Shrub	*Viburnum lentago*	Nannyberry				
Shrub	*Cornus racemosa*	Grey dogwood				
Total # Shrubs						

Post-Remediation Vegetation Monitoring
West Branch of Bloody Brook - (WBBB)
Onondaga, New York

Habitat Area: PSS-1

Date:

Weather: **Inspector(s):**

Planting Type	Species	Common Name	Number Proposed	Number Planted	Number Survived	Comments/Notes
Shrub	*Cornus amomum*	Silky dogwood				
Shrub	*Cephalanthus occidentalis*	Buttonbush				
Shrub	*Sambucus canadensis*	Elderberry				
Shrub	*Alnus incana*	Speckled alder				
Shrub	*Aronia arbutifolia*	Red chokeberry				
Total # Shrubs						

Post-Remediation Vegetation Monitoring
West Branch of Bloody Brook - (WBBB)
Onondaga, New York

Habitat Area: UPF-1

Date: _____

Weather: _____ **Inspector(s):** _____

Planting Type	Species	Common Name	Number Proposed	Number Planted	Number Survived	Comments/Notes
Tree	*Acer saccharum*	Sugar maple				
Tree	*Fagus grandifolia*	American beech				
Tree	*Prunus serotina*	Black cherry				
Tree	*Pinus strobus*	White pine				
Tree	*Quercus palustris*	Pin oak				
Tree	*Tsuga canadensis*	Eastern hemlock				
Total # Trees						
Shrub	*Viburnum dentatum*	Northern arrowwood				
Shrub	*Viburnum lentago*	Nannyberry				
Shrub	*Cornus racemosa*	Grey dogwood				
Total # Shrubs						

Post-Remediation Vegetation Monitoring
West Branch of Bloody Brook - (WBBB)
Onondaga, New York

Habitat Area: PFO-1

Date: _____

Weather: _____ **Inspector(s):** _____

Planting Type	Species	Common Name	Number Proposed	Number Planted	Number Survived	Comments/Notes
Tree	*Acer rubrum*	Red maple				
Tree	*Quercus palustris*	Pin oak				
Tree	*Salix niger*	Black willow				
Tree	*Betula nigra*	River birch				
Tree	*Quercus bicolor*	Swamp white oak				
Total # Trees						
Shrub	*Cornus amomum*	Silky dogwood				
Shrub	*Alnus incana*	Speckled alder				
Shrub	*Sambucus canadensis*	Elderberry				
Shrub	*Cephalanthus occidentalis*	Buttonbush				
Total # Shrubs						

Post-Remediation Vegetation Monitoring
West Branch of Bloody Brook - (WBBB)
Onondaga, New York

Habitat Area: USS-1

Date: _____

Weather: _____ **Inspector(s):** _____

Planting Type	Species	Common Name	Number Proposed	Number Planted	Number Survived	Comments/Notes
Shrub	*Cornus racemosa*	Grey dogwood				
Shrub	*Viburnum lentago*	Nannyberry				
Total # Shrubs						

Post-Remediation Vegetation Monitoring
West Branch of Bloody Brook - (WBBB)
Onondaga, New York

Habitat Area: PSS-2

Date: _____

Weather: _____ **Inspector(s):** _____

Planting Type	Species	Common Name	Number Proposed	Number Planted	Number Survived	Comments/Notes
Shrub	*Cornus amomum*	Silky dogwood				
Shrub	*Salix exigua*	Sandbar willow				
Shrub	*Salix discolor*	Pussy willow				
Shrub	*Sambucus canadensis*	Elderberry				
Shrub	*Lindera benzoin*	Spice bush				
Shrub	*Aronia arbutifolia*	Red chokeberry				
Total # Shrubs						

Post-Remediation Vegetation Monitoring
West Branch of Bloody Brook - (WBBB)
Onondaga, New York

Habitat Area: UPF-2

Date: _____

Weather: _____ **Inspector(s):** _____

Planting Type	Species	Common Name	Number Proposed	Number Planted	Number Survived	Comments/Notes
Tree	*Acer saccharum*	Sugar maple				
Tree	*Fagus grandifolia*	American beech				
Tree	*Prunus serotina*	Black cherry				
Tree	*Pinus strobus*	White pine				
Tree	*Tsuga canadensis*	Eastern hemlock				
Total # Trees						
Shrub	*Viburnum dentatum*	Northern arrowwood				
Shrub	*Cornus racemosa*	Grey dogwood				
Shrub	*Viburnum lentago*	Nannyberry				
Total # Shrubs						

Attachment C

Standard Operating Procedures for Removal of Invasive Species

Standard Operating Procedures for Removal of Invasive Species

Updated March 2019

The dominant invasive species at the Bloody Brook site, *Phragmites* (*Phragmites australis*) and purple loosestrife (*Lythrum salicaria*) are species not native to New York that spread rapidly, displacing other species and causing environmental damage. To the extent practical, we want to eliminate *Phragmites* and purple loosestrife from the Bloody Brook site. These species can reproduce from either seeds or from pieces of root or stems. In addition to these species, Japanese knotweed (*Polygonum cuspidatum)* has been observed at lesser densities on the site and should be handled in a similar manner, to be discussed below.

Three other invasive species including multiflora rose, honeysuckle, and buckthorn, have been identified on the site at lesser densities and differ from *Phragmites*, purple loosestrife, and Japanese knotweed in that they are woody and do not reproduce from pieces of cut stem. These invasive species reproduces from fruit and roots. Therefore, the cut stems (excluding fruit and roots) do not have to be disposed of off-site.

A Standard Operating Procedure (SOP) was developed and is provided below for non-woody and woody invasive species. Descriptions and photos of the each of the species are provided, as well as required procedures for effective removal for the non-woody and woody plants to ensure no transfer or regrowth.

***Phragmites*, Purple Loosestrife, and Japanese Knotweed**

Descriptions (http://nyis.info/)

Phragmites

Stems of the non-native *Phragmites* are hollow, usually green with yellow nodes during the growing season, and yellow when dry in the winter. *Phragmites* leaves are blue-green to yellow-green, up to 20 inches long and 1 to 1.5 inches wide at their widest point. They are arranged all along one side of a stem. In late July and August, *Phragmites* is in bloom with purple to gold highly branched panicles of flowers. The seeds are grayish and appear fluffy due to the silky hairs that cover each seed.

Purple Loosestrife

Purple loosestrife is a perennial with a dense, woody rootstock that can produce dozens of stems. Shoot emergence and seed germination occurs as early as late-April, and flowering begins by mid-June. The stalkless stem leaves are 5 to 14 centimeters long, lance-shaped, and opposite. Leaf pairs often grow at 90 degree angles from one another, and leaves near the flowers are sometimes alternate. Stems are upright, angular, and densely hairy. Mature plants can reach up to 4 meters in height, and older plants often appear bush-like, with sometimes dozens of woody stems growing from a single rootstock. The showy purple flowers have 5 to 7 petals and grow in pairs or clusters on 10 to 40 centimeters tall spikes.

Japanese Knotweed

Japanese knotweed (*Polygonum cuspidatum*) is an upright, shrubby, herbaceous, woody-appearing perennial reaching heights of 10 to 15 feet (3 to 4.5 m). The stems are smooth, stout, and hollow. Where the leaves attach to the stem, the stem is swollen with a membranous sheath surrounding the joints. The leaves are broadly ovate (road and rounded at the base and tapering toward the end), 3 to 6 inches (8 to 15 cm) long by 2 to 4 inches (5 to 10 cm) wide, alternating on stem, broadly oval to somewhat triangular or heart-shaped, pointed at the tip. The plant's shoots come up from a network of spreading rhizomes. These horizontal roots can reach lengths of 65 feet (20 m) or more. Japanese knotweed has branched sprays of small greenish-white flowers from August to September. The plant develops small winged fruits Seeds are triangular, shiny, very small, and about 1/10 inch (2.5 mm) long. Japanese knotweed spreads primarily by seed (transported by wind, water, animals, humans, or as a soil contaminant), stem fragments, and by shoots sprouting from its system of rhizomes

Removal Procedures for *Phragmites*, Purple Loosestrife, and Japanese Knotweed

1. If there is a seed head on the plant, this should be cut off and placed in a garbage bag for disposal, taking care not to drop seeds onto the ground.

2. The entire plant should then be dug up by:

    a. Loosening up the ground with a spading fork,

    b. Grasping the base of plant by hand and pulling the plant out by the roots, or use Uprooter to remove the stem and roots. *Phragmites* and Japanese knotweed produce long horizontal root systems, and purple loosestrife produces a large taproot. If possible, try to gently but firmly pull at the roots to remove as long a piece of root as possible. This will minimize the number of small pieces of root left in the ground (each of which can produce a new plant next year).

3. All of the plant is then placed in a garbage bag for disposal.

4. Take care not to step on, dig up, or otherwise damage desirable plants, especially any shrubs or trees.

This procedure is based on guidance from the NYSDEC on invasive species (www.dec.ny.gov/docs/lands_forests_pdf/sfinvasivecontrol.pdf) in the Strategic Plan for State Forest Management (www.dec.ny.gov/docs/lands_forests_pdf/spsfmfinal.pdf) and Cornell University's New York Invasives Species Information site (http://nyis.info/).

Multiflora Rose, Honeysuckle, and Buckthorn

Descriptions (http://nyis.info/)

Multiflora Rose

Multiflora rose, (*Rosa multiflora*), is a vigorous perennial shrub. Canes (stems) root at the tips and may reach heights of up to 10 feet. The red-to-green twigs may have numerous recurved thorns. Its pinnately compound leaves grow alternately with 5, 7, 9, or 11 oval, saw-toothed leaflets. The leaflets are nearly smooth on the upper surface and paler with short hairs on the underside. The base of each leaf stalk bears a pair of fringed bracts or stipules. The fringed stipules are the best characteristic to use to distinguish multiflora rose from other species. Multiflora rose shrubs can grow to a height of 10-15 feet and to a width of 9-13 feet. Clusters of showy, fragrant, white to white-pink, half-inch to one-inch diameter flowers, bloom in panicles, inflorescences with side stems, in late May or June. Roots are wide-ranging and capable of resprouting. In addition, growing stem tips that contact the soil surface are capable of rooting, through a process known as layering, to form new plants. Extensive thickets are formed this way.

Buckthorn

Common buckthorn (*Rhamnus cathartica*) is a small deciduous tree or large shrub that can grow to six meters in height. It has dull green oval or egg shaped leaves and is easily identified by the small thorns at the tip of its branches. Common buckthorn is a perennial shrub or small tree. It is found in lightly shaded areas and is tolerant of many soil types from well-drained sand to clay. Branches are tipped with a short thorn; a thorn may also be found in the fork between two branches. The leaves may be opposite or in an alternating pattern (both may be found on the same branch). The leaves are oval or egg shaped with small, serrated teeth. The leaf may be a dull green or a dark green with a lighter green on the under-side. Flowers are small with four sepals (a modified leaf that encloses the petals and other parts of the flower) and four petals and they form small clusters from the axils (the space between a leaf or branch and the stem/stalk of the plant) of leaves or on short twigs along the stem. The flowers are a yellowish to green color. Each flower is unisexual with either four stamens or one pistil with a plant being either male or female (dioecious). The fruit or berries are small (5-6 mm in diameter) and are a dark purplish or black color. Each berry will contain four hard seeds. The common buckthorn flowers during late spring (May-June) while leaves are emerging. The berries ripen during August and September and can be found still attached to the plant throughout the winter.

Honeysuckle Spp.

Several species of honeysuckle found in NY are characterized as invasive, including: *Morrow's honeysuckle (Lonicera morrowii), Tatarian honeysuckle (Lonicera tatarica), Amur honeysuckle (Lonicera maackii), and Japanese honeysuckle (Lonicera japonica)*. To the non-botanist, native and invasive non-native honeysuckles appear very similar. One way to distinguish between native and invasive honeysuckles is by looking at the stems. Native honeysuckles have solid stems while invasive honeysuckles have hollow stems. *L. morrowii, L. tatarica, and L. maackii* are perennial shrubs; *L. japonica* is a perennial woody vine (although its leaves can remain green throughout mild winters). The shrub forms range from 6 to 15 feet in height, while vines can reach 30 feet in length. The egg-shaped leaves range from 1 to 3 inches in length and are arranged oppositely along stems. Invasive honeysuckles begin flowering from May to June and bear small (less than 1 inch long), very fragrant tubular flowers ranging from creamy white through various shades of pink to crimson. *L. morrowii and L. tatarica* produce ¼ inch red berries from mid-summer through early-fall; *L. maackii's* dark-red berries don't ripen until late-fall*; L. japonica* produces dark-purple or black berries in the fall.

Management and Removal Procedures for Multiflora Rose, Buckthorn, and Honeysuckle

Seedlings can be pulled by hand. Small plants can be dug, but care needs to be taken to remove all roots. Frequent, repeated cutting or mowing at the rate of three to six times per growing season, for two to four years, has been shown to be effective in achieving high mortality of multiflora rose. In natural communities, cutting of individual plants is preferred to site mowing to minimize habitat disturbance. The cut stems, if bare of fruit, can be piled to provide habitat/cover for small wildlife on site.

1. Ideally, removal should be done when there are no berries/seeds on the plant. If not feasible, if there are berries/seeds on the plant, these should be cut off and placed in a garbage bag for disposal, taking care not to drop seeds onto the ground.

2. The upper portions of the plant (e.g., trunk, branches) should be cut off using pruners or loppers. These can be placed in a pile and left on site.

3. The roots should then be dug up unless repeated cutting is determined to be more appropriate for the plant (e.g., large root area which could result in disturbance of surrounding native plants) by:

    a. Loosening up the ground with a spading fork,

    b. Grasping the base of plant by hand and pulling the plant out by the roots, or use Uprooter to remove the roots.

4. The roots are then placed in a garbage bag for disposal.

5. Take care not to step on, dig up, or otherwise damage desirable plants, especially any shrubs or trees.

Equipment

Spading forks
Uprooter
Clippers/pruners/loppers
Boots
Gloves
Plastic disposal bags
Reusable plastic bins for transferring plant waste with thorns

Appendix K

Responsibilities of
Property Owners, Onondaga County, Town of Salina, Village of Liverpool, and Remedial Party

Responsibilities

The responsibilities for implementing the Site Management Plan ("SMP") for the Bloody Brook site (the "site"), are divided between private property owners, Onondaga County, Town of Salina, Village of Liverpool, and the Remedial Party. The portion of the brook subject to the remedial activities and covered by this SMP include an approximately 5,000 foot long section of the brook and side banks between the New York State Thruway and Onondaga Lake Parkway, in the Town of Salina and Village of Liverpool, Onondaga County, New York. The brook provides drainage capacity and flood protection to area properties and is maintained by Onondaga County as part of the Bloody Brook Drainage District. Onondaga County has obtained easements from area property owners for access to maintain the brook.

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

Lockheed Martin Corporation
497 Electronics Parkway
Liverpool, New York 13088

Responsibilities of Private Property Owners, Onondaga County, Town of Salina, and Village of Liverpool:

1) The parties listed above shall follow the provisions of the SMP as they relate to future construction and excavation at the site.

2) The parties listed above shall grant access to the site to the RP and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.

3) The parties listed above are responsible for assuring the security of the remedial components located on its property to the best of its ability. In the event that damage to the remedial components or vandalism is evident, the site's RP should be notified in accordance with the timeframes indicated in Section 3 of the SMP (Institutional and Engineering Control Plan).

4) In the event some action or inaction by the parties listed above adversely impacts the site, the party must (i) notify the site's RP in accordance with the time frame indicated in Section 3 of the SMP (Institutional and Engineering Control Plan) and (ii) coordinate the performance of necessary corrective actions with the RP.

5) The parties listed above must notify the RP of any change in ownership of the site property within the easement (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the site property/ies.

Remedial Party Responsibilities

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

2) In accordance with a periodic time frame determined by the NYSDEC, the RP shall periodically certify, in writing, that all ICs set forth in this SMP remain in place and continue to be complied with. The RP shall complete a written certification in order to allow for inclusion of the certification in the site's Periodic Review Report (PRR) to the NYSDEC.

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

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

5) If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the full distribution list.

6) The RP shall notify the NYSDEC of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any remedial system (Engineering Controls). The RP shall provide contact information for the new party/entity. 6 NYCRR Part contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 2.4 of the SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

7) The RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section 1.3 (Regulator Notifications) of the SMP.

8) Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to the NYSDEC for approval an amended SMP.

9) Any change in use, change in ownership, change in site classification (*e.g.*, delisting), reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the Department to discuss the need to update such documents.

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

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