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Georgia-Pacific LLC

Site Management Plan

Willsboro Black Ash Pond Site
Willsboro, Essex County, New York

NYSDEC Site #: 516009

December 2014

Revised July 8, 2019

ARCADIS

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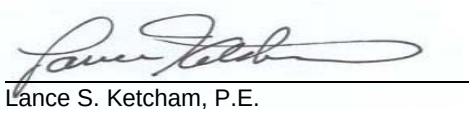

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Site Management Plan

Willsboro Black Ash Pond Site
Willsboro, Essex County,
New York

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Our Ref.:
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Date:
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REVISIONS TO FINAL APPROVED SITE MANAGEMENT PLAN

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
1	-	Adjustments at time of transfer of SM to Town of Willsboro	July 8, 2019

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Acronym	Definition
ANC	Adirondack Nature Conservancy
AOC	Order on Consent and Administrative Settlement
EC	Engineering Control
ECL	Environmental Conservation Law
ESE	Earth Science Engineering
EWP	Excavation Work Plan
FER	Final Engineering Report
Georgia-Pacific	Georgia-Pacific LLC
HASP	Health and Safety Plan
IC	Institutional Control
mg/kg	milligram per kilogram
NYCRR	New York Codes, Rules, and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
PCBs	Polychlorinated Biphenyls
PDI	Pre-Design Investigation
ppb	parts per billion
PRP	potential responsible party
QA/QC	quality assurance and quality control
RAWP	Remedial Action Work Plan

ROD	Record of Decision
RSCO	recommended soil cleanup objective
SI	Site Investigation
Site	Willsboro Black Ash Pond Site
SMP	Site Management Plan
SCGs	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objective
SVOC	Semi-Volatile Organic Compounds
SWPPP	Stormwater Pollution Prevention Plan
TCL	Target Compound List
TAGM	Technical and Administrative Guidance Memorandum
Town	Town of Willsboro
VOC	Volatile Organic Compounds
WWTP	Wastewater Treatment Plant

1. Introduction and Description of Remedial Program

1.1 Introduction

This Site Management Plan (SMP) is required as an element of the remedial program at the Willsboro Black Ash Pond Site (Site) administered by New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation. The Site was remediated in accordance with the Final Remedial Action Work Plan (RAWP) (ARCADIS 2012b). The RAWP was prepared in accordance with the requirements of the March 2007 Record of Decision (ROD; NYSDEC 2007), the August 23, 2011 Order on Consent and Administrative Settlement (AOC) Index No. A5-0771-07-11 (NYSDEC 2011b), and the August 2011 Explanation of Significant Difference (ESD; NYSDEC 2011a) issued by the NYSDEC for Site #516009.The RAWP was approved by NYSDEC on September 6, 2012 (NYSDEC 2012a).

This SMP also meets requirements in Section I.A.2 of the August 2011 AOC. The objective of the SMP is to identify and implement the institutional controls (ICs) and engineering controls (ECs) required for the Site, as well as monitoring and/or operation and maintenance of the remedy. This SMP was prepared in accordance with the requirements in Section 6.2 of NYSDEC DER-10 *Technical Guidance for Site Investigation and Remediation* (NYSDEC DER-10; NYSDEC 2010), and the guidelines provided by NYSDEC via email on November 21, 2012 (i.e., in their template and checklist for development of a SMP) (NYSDEC 2012c).

A Final Engineering Report (FER) has also been prepared for the Site and submitted to NYSDEC, and includes a description of the activities completed pursuant to the RAWP (ARCADIS 2014).

1.1.1 General

Georgia-Pacific LLC (Georgia-Pacific) entered into an AOC with the NYSDEC to remediate a property located in, and owned by, the Town of Willsboro (Town or Owner), Essex County, New York. This AOC required the Potential Responsible Party (PRP), Georgia-Pacific, to perform a remedial design and construction work on the former black ash ponds at the Site. The site location and boundaries are provided in Figure 1 of this SMP and in the Land Title Survey provided in Appendix A of the FER for this Site (ARCADIS 2014). The Environmental Easement (Town 2014) as recorded by the Town at the NYSDEC's request is attached as Appendix A.

After completion of the remedial work described in the RAWP (ARCADIS 2012b), some limited subsurface black ash material remains at the Site, and is hereafter

referred to as “remaining black ash material.” This SMP was prepared to maintain the elements of the remedy which were constructed to isolate the black ash material from the Boquet River and to manage the remaining subsurface black ash material contained by the soil cover system at the Site until the Environmental Easement is extinguished in accordance with Environmental Conservation Law (ECL) Article 71, Title 36 (NYSDEC 2013a). All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in NYS.

1.1.2 Purpose

The Site contains remaining black ash materials left after completion of the remedial action. ECs have been incorporated into the site remedy to control exposure to remaining black ash materials during the use of the Site to ensure protection of the environment. The Environmental Easement granted to the NYSDEC, and recorded by the Town with the Essex County Clerk, requires compliance with this SMP and all ECs and ICs placed on the Site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring, and reporting measures for all ECs and ICs. This SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement for remaining black ash materials that remain at the Site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor (i.e., the Town) of the Environmental Easement and the grantor’s successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of procedures required to manage remaining black ash material at the Site after completion of the Remedial Actions, including: (1) implementation and management of all ECs and ICs; (2) monitoring; (3) maintenance of containment systems; and (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports[1].

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan (EC/IC Plan) for implementation and management of EC/ICs; (2) a Site Monitoring Plan for implementation of site monitoring; and (3) a Maintenance Plan.

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[1] In accordance with Section D.3 of the AOC, an Annual Report will be submitted to NYSDEC every year, by the first day of the month, following the anniversary of the start of the SMP. This Annual Report will fulfill the requirements of the Periodic Review Report, and as such, the Annual Report and Periodic Review Report are synonymous and are referred to as the Periodic Review Report for the remainder of the related discussion within this SMP.

This SMP also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (i.e., the Covenant Not to Sue).

- Failure to comply with this SMP is also a violation of ECL, 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 (NYSDEC 2006), and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this SMP will be proposed in writing to the NYSDEC's Project Manager. In accordance with the Environmental Easement for the Site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 Site Background

1.2.1 Site Location and Description

The Site is located at the end of School Street in the Town of Willsboro (Town), Essex County, New York and is identified as Section 31.9, Block 1, and Parcel 20.100 on the Essex County Tax Map. The Site is bounded by the Boquet River on the north and west sides, to the east by lands owned by the Adirondack Nature Conservancy (ANC), and to the south by additional lands owned by the ANC and Town (see Figure 1). The surface at the Site is relatively flat with the topography slightly rising to the south and west. The Town waste water treatment plant (WWTP) occupies a contiguous 2.7 acre parcel along the southern border of the property south of the Site.

The Site is located within the floodplain of the Boquet River, approximately 2 miles west of Lake Champlain. A fishing access parking area is located to the west of the Site and along the river, and a boat launch is located on the Boquet River to the east of the Site. The approximate coordinates of the Site location are N 44° 22' 8.4" latitude, and E -73° 23' 27.6" longitude. The boundaries of the Site are more fully described in the Land Title Survey provided in Appendix A of the FER for this Site.

1.2.2 Site History

From 1884 to 1964, the Champlain Fiber Company, later known as Willsboro Pulp Mill, operated a pulp mill on the north side of the Boquet River, opposite from the Site, which is located on the south side of the River. In 1964, the mill property was purchased by Georgia-Pacific. In 1966, the Town acquired the property from Georgia-Pacific.

A settling basin/lagoon was created at the Site on the south side of the River by constructing a crescent shaped dike/berm, 12 to 15 feet high along the river bank. Black ash materials were first trucked, then piped to the south side of the river and deposited within the lagoon, approximately 900 feet long and 400 feet wide, created by the berm. The black ash is the residue of spent black liquor combustion; black liquor was used in the making of paper pulp, and was a combination of soda ash, chemical lime, wood fiber, and soft coal. The black ash accumulated within the basin during the years of paper mill operation, and over time the berm constructed to retain the black ash material has eroded away in some locations, thereby exposing the black ash to the river.

To determine the nature and extent of black ash material at the Site, Earth Science Engineering (ESE) performed a site investigation in November 2006 (ESE 2006). The investigation found that the black ash material varied in thickness from 4 feet to 20 feet below existing surface. The black ash material consisted of black ash materials underlain in many locations by a white sludge like material. The black ash materials were saturated at the ash/sludge interface. The riverine soils encountered below the sludge were also saturated.

1.2.3 Geologic Conditions

Below is a summary of the geologic conditions at the Site as presented in ESE's Site Investigation Report (SI Report). Additional details can be found in that report (ESE 2006).

Consistent with the topography of the area, stormwater runoff percolates through the permeable black ash overburden and seeps into the Boquet River through a former berm and eventually into Lake Champlain. The soils in the vicinity of the Site are comprised primarily of mine spoils and urban land/fill. Review of surficial geologic mapping indicates that the unconsolidated soils in the vicinity of the Site consist of a thin layer of lacustrine silt and clay, likely laminated and calcareous, overlain by riverine sandy loam, sands, and gravels. The unconsolidated soils are likely underlain by glacial till. The thickness of these types of unconsolidated deposits is typically

variable in the immediate vicinity of the Boquet River. Regional bedrock geologic mapping indicates that bedrock underlying the Site consists of Potsdam Sandstone from the Pre-Cambrian Era. River sediment type soils were found beneath the black ash materials at the Site.

Consistent with the topographic setting of the Site and reported observation of seeps from the Black Ash Pond into the river, shallow groundwater flow in the area of the Site would be perceived to generally flow across the Site from south to north. Groundwater within the deeper bedrock generally occurs within fractures, joints, and bedding planes commonly enlarged due to dissolution of carbonates and evaporates. There are reportedly no private or municipal groundwater wells used to supply potable water within a two (2) mile radius of the Site. The residents within a 1/4 mile radius of the Site receive their domestic water from the Town. The Town receives raw water from Lake Champlain via an intake within Willsboro Bay approximately two miles north of the project site.

1.3 Summary of Previous Investigations

Investigations were performed to characterize the nature and extent of black ash materials at the Site. The results of the investigations are described in detail in the following reports:

- SI Report, submitted to NYSDEC in November 2006 (ESE 2006); and
- Pre-Design Investigation Summary Report (PDI Report), submitted to NYSDEC in January 2012 (ARCADIS 2012a).

Generally, the SI Report determined that the main categories of contaminants that could exceed potential Standards, Criteria, and Guidance (SCGs) were inorganics. Below is a summary of the site conditions as presented in the November 2006 SI Report:

As described in the SI Report, many soil, groundwater, and sediment samples were collected from May 2005 through November 2006 to characterize the nature and extent of black ash materials. Samples collected during the SI were analyzed for the Target Compound List (TCL) parameters, including Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Polychlorinated Biphenyls (PCBs), Pesticides, and Metals.

Soil

Samples of the black ash material on the property contain SVOCs and metals at concentrations which exceeded the clean-up goals established in TAGM 4046 (NYSDEC 1994). Specifically, one SVOC, benzo(a)pyrene was detected above the recommended soil cleanup objective (RSCO) of 61 parts per billion (ppb) in two samples (630 ppb and 84 ppb). However, the 6 NYCRR Part 375 Soil Cleanup Objective (SCO) for benzo(a)pyrene, for both unrestricted land use and protection of ecological resources, is 1,000 ppb (NYSDEC 2006), as such, none of the SVOCs identified in the fill materials exceeded the SCO. Therefore, no remedial alternatives needed to be evaluated to address SVOCs.

Metals analysis of the black ash materials identified aluminum, arsenic, antimony, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, potassium, sodium, vanadium, and zinc at levels above the TAGM 4046 RSCOs. All of the metals detected in the impacted materials did not exceed the SCOs established in the 6 NYCRR Part 375, for both unrestricted land use and protection of ecological resources. Therefore, no remedial alternatives needed to be evaluated to address removal of metals; however, the remedial goals for the Site included elimination or reduction of the migration and exposure to of specific (non-native) metals, as discussed above.

Site-Related Groundwater

During the SI, seven monitoring wells were installed and sampled to gather water quality data. As described in the SI, groundwater was found in the monitoring wells at the Site at various depths ranging from 7 to 16 feet from the top of the monitoring well casing. In general, the flow of groundwater in the vicinity of the Site is from the higher elevations south of the Site toward the Boquet River. SVOCs were not detected in 5 of the 7 wells. Diethlyphthalate, di-n-butylphthalate, and butlybenzylphthalate were detected in two wells, MW-1 and MW-2, at levels below the drinking water standard of 50 ppb. Aluminum, antimony, chromium, iron, magnesium, manganese, sodium, and thallium were detected in the groundwater samples collected within the footprint of the black ash pond at levels exceeding the Class GA Groundwater Quality Standards or Guidance Values for groundwater (NYSDEC 2008). As discussed above, the remediation goals for the Site included attaining, to the extent practicable, ambient groundwater quality standards

Sediments

Sediment samples were collected at two depths (6 inches and 18 inches below sediment surface) at 2 and 4 locations upgradient and downgradient of the Site, respectively. Each of the VOC or SVOC parameters detected in the sediments were identified at concentrations significantly below one or more of the three parameter specific sediment criteria categories in the NYSDEC *Technical Guidance for Screening Contaminated Sediment* (NYSDEC 1999). PCBs and pesticides were not detected in the sediment samples.

Metals analysis of the sediments identified concentrations of antimony and nickel at levels which exceed guidance levels in the NYSDEC *Technical Guidance for Screening Contaminated Sediments* (NYSDEC 1999). The following sediment samples exhibited metal concentrations that exceeded the corresponding guidance lowest or severe effect level:

Sample ID	Metal	Concentration	Lowest Effect Level	Severe Effect Level
SD-5 18" (downgradient)	Antimony	68.5 mg/kg	2.0 mg/kg	25.0 mg/kg
SD-2 18" (upgradient)	Antimony	7.2 mg/kg	2.0 mg/kg	25.0 mg/kg
SD-4 06" (downgradient)	Antimony	16.5 mg/kg	2.0 mg/kg	25.0 mg/kg
SD-4 18" (downgradient)	Antimony	6.0 mg/kg	2.0 mg/kg	25.0 mg/kg
SD-5 18" (downgradient)	Nickel	16.6 mg/kg	16.0 mg/kg	50.0 mg/kg

NYSDEC determined that no remedial alternatives needed to be evaluated to address the sediments at the Site.

1.4 Summary of Remedial Actions

The Site was remediated in accordance with the NYSDEC-approved RAWP dated August 2012 (ARCADIS 2012b) and ECL Permit DEC No. 5-1552-00188/00001 dated September 17, 2012 (NYSDEC 2012b).

The following is a summary of the remedial actions performed at the Site:

1. Excavation of black ash material along the riverbank to meet the remedial action objectives of reshaping and stabilizing the riverbank, and movement and consolidation of such material in the upland soil cover area.

2. Construction of the stream bank stabilization features along a portion of the riverbank, and reinforcing the riverbank with riprap underlain with a geotextile fabric.

3. Grading of the Site (before placement of soil cover and after placement of soil cover) to reduce the infiltration of water by diverting storm water flow around the consolidated black ash material and reducing the potential for ponding.

4. Construction of an inlet/outlet structure to reconnect the Site floodplain to the Boquet River.

5. Construction and maintenance of a soil cover system consisting of on-site fill material and topsoil to prevent exposure to remaining black ash material remaining at the Site.

6. Execution and recording by the Town of an Environmental Easement to restrict land use.

7. Installation of necessary ICs as outlined in Section 2 of this SMP.

8. Development and implementation of this SMP for long term management of the Site as required by the Environmental Easement, which includes plans for: (1) ICs/ECs, (2) monitoring, (3) maintenance, and (4) reporting.

Riverbank reshaping and placement of the soil cover system remedial activities were completed at the Site in November 2012. Final restoration of the Site was completed in May 13, 2013. The as-built record drawings for the completed remedial activities are included in Appendix B.

1.4.1 Remaining Material On-Site

As a result of the earthwork required to reshape the riverbank area at the Site, extra material (not required for reshaping/restoration of the riverbank area) was consolidated on the upland black ash pond area (Figure 2). A soil cover system consisting of topsoil from an off-site source was installed over the graded on-site material, as discussed in Section 2.2.1.

As no black ash material was removed from the Site during remedial activities, the black ash material represented by the samples presented in the SI remains at the Site after completion of Remedial Action.

2. Engineering and Institutional Control Plan

2.1 Introduction

2.1.1 General

Since remaining black ash material exists at the Site, ECs and ICs are required to provide an additional level of safety in the protection of the environment. This EC/IC Plan describes the procedures for the implementation and management of all EC/ICs at the Site. The EC/IC Plan is one component of the SMP (as per Section 6.2.1 of DER-10) and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of EC/ICs on the Site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Health and Safety Plan (HASP) and an air monitoring plan (i.e., fugitive dust and particulate monitoring as per Appendix 1B of DER-10 [NYSDEC 2010]), as well as the Excavation Work Plan (EWP) (Appendix C) for the proper handling of remaining black ash materials that may be disturbed during maintenance or redevelopment work on the Site[2]; and
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the Site remedy, as determined by the NYSDEC.

[2] Note that the EWP requires that a Stormwater Pollution Prevention Plan (SWPPP) be prepared for projects that disturb an area greater than one acre. An example SWPPP for this Site is provided as Appendix F to this SMP, and further discussion regarding the requirements of the SWPPP are discussed in the EWP (Appendix C).

2.2 Engineering Controls

2.2.1 Engineering Control Systems

2.2.1.1 Soil Cover

Exposure to remaining black ash materials at the Site is controlled by a soil cover system placed over a portion of the Site, then seeded. This cover system is comprised of a minimum of 12 inches of clean topsoil, which was seeded with a Northeast Upland Native/Naturalized Wildflower Mix in accordance with suggestions of the Town (i.e., the landowner). Wood chips, produced during site clearing activities, were placed along the boundary between the soil cover and the undisturbed floodplain area. The extent of the soil cover area is shown on Figure 2.

The soil cover is a permanent control and the quality and integrity of this system will be inspected annually for a minimum of four years post construction. Inspection activities will include monitoring of the remedy for impacts related to the natural acts and performance of vegetation replacement for dead loss. Georgia-Pacific acted as the Site Manager and prepared and submitted Periodic Review Reports to the NYSDEC during the period of their involvement in the implementation of the SMP. Upon approval by NYSDEC on June 25, 2019, Georgia-Pacific ended their involvement in the implementation of the SMP and the Town took full responsibility for the Site, including all required monitoring activities and IC/ECs in accordance with the Environmental Easement the Town and NYSDEC have each executed and which the Town has recorded, and pursuant to paragraph 3(5) of the Property Access License Agreement dated July 25, 2011, pursuant to which the Town, as Grantor, agreed to be responsible for operation, monitoring and maintenance of the Agreement Areas, including, but not limited to, vegetation replacement, effective upon the NYSDEC's determination that Georgia-Pacific's involvement in implementation of the SMP may end.

The EWP outlines the procedures required to be implemented in the event the cover system is breached, penetrated, or temporarily removed, and underlying remaining black ash material is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Site Monitoring Plan included in Section 3 of this SMP.

2.2.1.2 Signage

It is recommended that the Town post signage at the Site after completion of restoration activities to provide a supplemental mechanism to help protect the

constructed soil cover system. Monitoring and maintenance of the signs, if any, will be the responsibility of the Town, and is not required by this SMP.

2.2.2 Criteria for Completion of Remediation

Generally, remedial processes are considered completed when effectiveness 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 6.6 of NYSDEC DER-10 (NYSDEC 2010).

2.3 Institutional Controls

A series of ICs are required by the AOC to: (1) implement, maintain and monitor EC systems; (2) prevent future exposure to remaining black ash material by controlling disturbance of the cover material; and (3) limit the use and development of the Site to Restricted Residential uses only (as defined by 6 NYCRR Part 375-1.8(g)(2)(ii) [NYSDEC 2006], restricted residential use will include recreational activities). Adherence to these ICs on the Site is required by the Environmental Easement and will be implemented under this SMP. These ICs are:

- Compliance with the Environmental Easement and this SMP by the Grantor (i.e., the Town) and the Grantor's successors and assigns;
- Maintain all ECs as specified in this SMP;
- Inspect ECs at the Site at a frequency and in a manner defined in the SMP; and
- Data and information pertinent to management of the Site must be reported at the frequency and in a manner defined in this SMP.

ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement with consent of NYSDEC.

The Site has a series of ICs in the form of site restrictions. Adherence to these ICs is required by the Environmental Easement. Site restrictions that apply are:

- The property may only be used for Restricted Residential use provided that the long-term ICs included in this SMP are employed;
- The property may not be used for a higher level of use, such as Unrestricted Residential use without additional remediation by the Owner and amendment of the Environmental Easement, as approved by the NYSDEC;
- All future activities on the property that have the potential to disturb remaining black ash material must be conducted in accordance with this SMP;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use;
- Vegetable gardens and farming on the property are prohibited; and
- Through June 25, 2019, Georgia-Pacific has submitted to NYSDEC an annual written statement that certifies, under penalty of perjury, that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and (2) nothing has occurred that impairs the ability of the controls to protect the environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access the Site at any time in order to evaluate the continued maintenance of any and all controls. In subsequent years, the property owner will submit the certifications on a schedule specified by the NYSDEC.

2.3.1 Excavation Work Plan

The Site has been remediated for Restricted Residential use. Any future intrusive work that has the potential to penetrate the soil cover, or encounter or disturb the remaining black ash material, including any modifications or repairs to the existing cover system, are prohibited without prior notification to the property Owner (i.e., the Town or any future owners), and completion and approval of a Work Plan that must be in compliance with the EWP (attached as Appendix C to this SMP). Work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a HASP, which must include a section on air monitoring, prepared for the Site. A sample HASP is attached as Appendix D to this SMP that was included in the NYSDEC-approved RAWP. This sample HASP was prepared for use for construction activities, and the Contractor performing the remedial activities

prepared its own site-specific HASP. Similarly, any contractor selected to perform future intrusive work must also prepare its own site-specific HASP. Based on future changes to State and Federal health and safety requirements, and specific methods employed by future contractors, the HASP will be updated and re-submitted with the notification provided in the EWP. Any intrusive construction work will be performed in compliance with the EWP and HASP, and will be included in the periodic inspection and certification reports submitted in accordance with Section 5 of this SMP.

As stated in the EWP, except in the event of an emergency requiring action to prevent or respond to a release or imminent threat of release, the NYSDEC is required to be notified and approval obtained within seven days in advance of any intrusive activities or activities involving maintenance of the riprap placed along the river above or below the edge of water line. However, any general inspection of the riprap, above or below the edge of water line, will not require any such notification or permission from the NYSDEC.

The site owner and associated parties preparing the remedial documents to be submitted to the State, and parties to be performing such future work, are completely responsible for the safe performance of all intrusive work, including but not limited to: the structural integrity of excavations; proper disposal of excavation de-water; control of runoff from open excavations into remaining black ash material; and for structures that may be affected by excavations (such as building foundations). The Site's owner (i.e., the Town or any future owners) will ensure that site development activities will not interfere with, or otherwise impair or compromise, the ECs described in this SMP.

2.4 Inspections and Notifications

2.4.1 Inspections

Inspections of remedial components installed at the Site will be conducted at the frequency specified in the Site Monitoring Plan schedule provided in Section 3 of this SMP. For the first four years comprehensive site-wide inspection will be conducted annually, at a minimum, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of the environment;
- Compliance with requirements of this SMP and the Environmental Easement;

- Achievement of remedial goals (included in the ESD [2011a]);
- Observations made during monitoring events specifically with regard to whether there are visual indications of subsurface work/excavation, significant soil erosion, as well as survival of vegetation installed as part of restoration activities;
- If site records are complete and up-to-date; and
- Changes, or needed changes, to the remedial or monitoring system.

Inspections will be conducted in accordance with the procedures set forth in the Site Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this SMP (Section 5).

If an emergency, such as a natural disaster, with the potential to impact the ECs or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be conducted within 5 business days of the event (to the extent practical and safe) to verify the integrity of the EC/ICs implemented at the Site by a Georgia-Pacific representative for up to the first four years or, thereafter, the owner or a professional engineer or other qualified environmental professional, as acceptable to NYSDEC, on behalf of the owner.

2.4.2 Notifications

Notifications will be submitted by the Town to the NYSDEC as needed for the following reasons:

- Sixty-day advance notice of any proposed changes in the Site use that are required under the terms of 6 NYCRR Part 375 and/or ECL (NYSDEC 2013a);
- Seven-day advance notice of any proposed ground-intrusive activities or activities involving maintenance of the riprap pursuant to the EWP;
- Verbal notice by noon of the following business 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
- Within 45 days, follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action will be submitted to the

NYSDEC and will describe and document 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 has been provided with all approved work plans and reports, including this SMP, and the Environmental Easement.

- Within 15 days after the transfer of all or part of the property, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions. Such emergencies have the potential to affect the ECs. In the event of such emergencies with the potential to affect the ECs, the actions listed in the below Contingency Plan will be followed.

The remainder of this section describes the contacts to be notified in the event of an emergency, as well as emergency vehicular access to the Site, evacuation procedures, and routes to the hospital.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally-related situation or unplanned occurrence requiring assistance, the Owner (i.e., the Town or any future owners) or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. These emergency contact lists must be maintained in an easily accessible location at the Site (during inspections or other occupancy) and at the Town's office.

Table 1 – Emergency Contact Numbers

Emergency Contact	Phone Number
Medical, Fire, and Police:	911
One Call Center:	800.272.4480 (3 day notice required for utility markout)
Poison Control Center:	800.222.1222
National Response Center (spills):	800.424.8802

Emergency Contact	Phone Number
NYSDEC Spills Hotline:	800.457.7362
Town of Willsboro Code Enforcement Office:	518.963.7411
Georgia-Pacific-designated Contact (Environmental Remediation Department):	404.652.4000

* Note: Contact numbers subject to change and should be updated as necessary.

2.5.2 Site Access and Egress, and Map and Directions to Nearest Health Facility

Emergency vehicular access to the Site, as well as evacuation egress from the Site, will be available at the terminus of School Street in Willsboro, NY. In the event of an emergency, available personnel will be posted at the entrance from School Street to escort the rescue vehicle on to the Site to avoid any potential delay in the emergency response.

Site Location: Terminus of School Street, Willsboro, NY 12996

Nearest Hospital Name: Elizabethtown Community Hospital

Hospital Location: 75 Park Street, Elizabethtown, NY 12932

Hospital Telephone: 518.873.6377

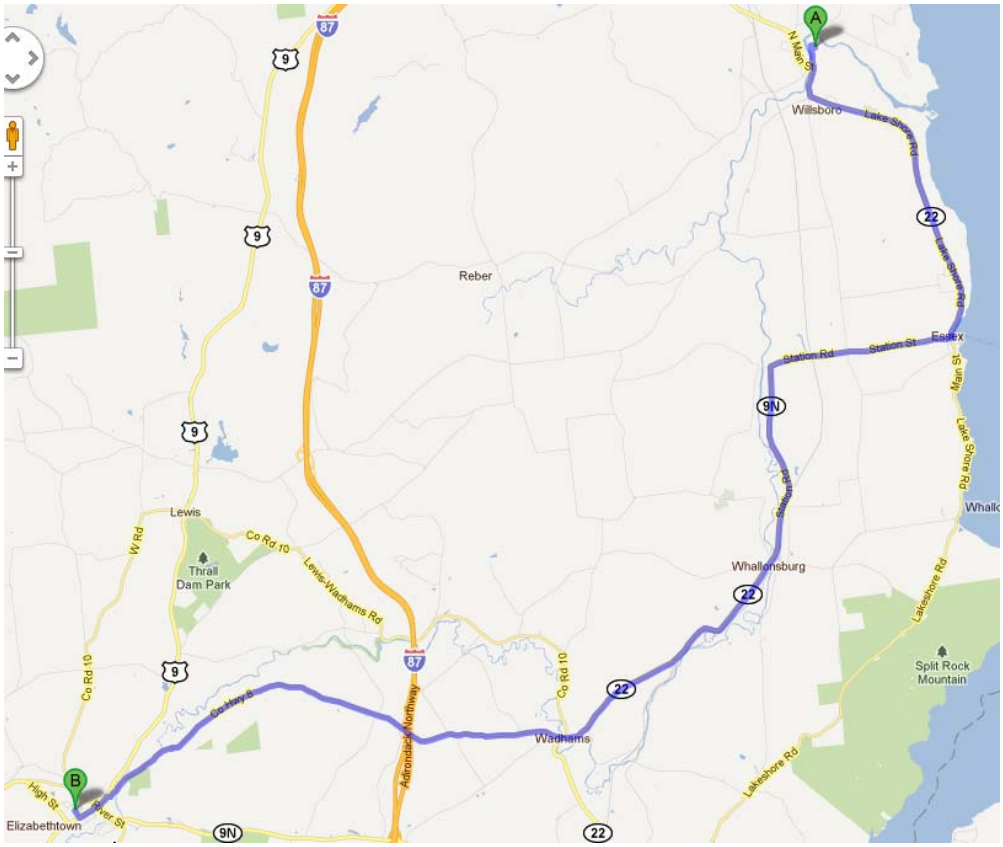
Directions to the Hospital:

1. Head northwest on School St. toward NY-22 N/S Main St. (0.4 mi).
2. Continue straight onto NY-22 S/S Main St., continue to follow NY-22 (4.9 mi).
3. Turn right onto NY-22 S/Station St., continue to follow NY-22 (9.3 mi).
4. Slight right onto Elizabethtown-Wadhams Rd (7.0 mi).
5. Turn left onto US-9 S/Maple St, continue to follow US-9 S (0.5mi).
6. Take second right onto Park St., destination will be on right (0.1 mi).

Total Distance: 22.2 mi.

Total Estimated Time: 28 Minutes

Figure 3: Map of Route from the Site to the Hospital:



2.5.3 Response Procedures

As appropriate, the fire department and other emergency first responders will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table 1). A copy of the list will be maintained in an easily accessible location at the Town's office and will be made readily available to personnel at all times. The Contingency Plan will not be modified without NYSDEC review and approval.

3. Site Monitoring Plan

3.1 Introduction

3.1.1 General

The Site Monitoring Plan describes the measures for evaluating the performance and effectiveness of the NYSDEC-approved remedy, including the installed soil cover system, stabilized riverbank (including the inlet/outlet structure), and seeded or planted vegetation. This Site Monitoring Plan may only be revised with the approval of NYSDEC. This Site Monitoring Plan has been prepared in accordance with Section 6.2.2 of DER-10 (NYSDEC 2010).

3.1.2 Purpose and Schedule

This Site Monitoring Plan describes the methods to be used for:

- Assessing achievement of the remedial goals;
- Evaluating site information periodically through performance of a site-wide inspection to confirm that the remedy continues to be effective in protecting the environment; and
- Preparing the necessary reports for the various monitoring activities.

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

- Monitoring protocol and frequency;
- Performance criteria for the soil cover area, stabilized riverbank (including the inlet/outlet structure), and seeded or planted vegetation;

- Reporting requirements; and
- Periodic certification.

Monitoring of the Site will be conducted on an annual basis, at a minimum, for the first four years following completion of construction. The frequency thereafter will be determined by NYSDEC in collaboration with the Town. The monitoring program is outlined in detail in Sections 3.2 through 3.7 below.

3.2 Stabilized Riverbank Monitoring

The stabilized riverbank will be visually inspected for signs of erosion, removal, and/or modification since completion of the remedial construction activities or since the last inspection, as appropriate. At a minimum, the area will be inspected for the following performance criteria:

- slope failure or evidence of erosion (e.g., ruts, gullies, washouts, or sloughing);
- movement or disturbance of riprap (that would cause exposure/disturbance of the remaining black ash material); and
- areas with undercut banks.

If conditions observed regarding the above performance criteria are noted, those observations will be documented on the Site-wide Inspection Form (Appendix E), and maintenance actions will be evaluated (see Section 4).

3.3 Soil Cover System Monitoring

The soil cover monitoring is covered separately from the other ECs in this chapter because it is a passive component of the site remedy. The soil cover will be visually inspected for signs of erosion, removal, and/or modification since completion of the remedial construction activities or since the last inspection, as appropriate. At a minimum, the area will be inspected for the following performance criteria:

- erosion (e.g., ruts, gullies, washouts, or sloughing);
- effectiveness of erosion controls in areas where vegetation has yet to establish;
- depressions and/or surface water ponding;
- areas where excessive settlement has occurred relative to the surrounding areas;
- drainage or growth problems;
- stressed or sparse cover;

- exposed remaining black ash material; and
- other conditions that could affect the performance of the completed remedial actions.

If conditions observed regarding the above performance criteria are noted, those observations will be documented on the Site-wide Inspection Form (Appendix E), and maintenance actions will be evaluated (see Section 4).

3.4 Vegetation Monitoring

The vegetation seeded or planted during restoration at the Site will be visually inspected for general survival since completion of the remedial construction activities or since the last inspection, as appropriate. At a minimum, the vegetation will be inspected for the following performance criteria:

- stressed or sparse cover; and
- survival and condition of plantings.

If conditions observed regarding the above performance criteria are noted, those observations will be documented on the Site-wide Inspection Form (Appendix E), and maintenance actions will be evaluated (see Section 4).

3.5 Undisturbed Area Monitoring

The vegetation in the undisturbed area will be visually inspected for general survival and growth since completion of the remedial construction activities or since the last inspection, as appropriate. At a minimum, the vegetation will be inspected for the following performance criteria:

- stressed or sparse cover.

If conditions observed regarding the above performance criteria are noted, those observations will be documented on the Site-wide Inspection Form (Appendix E), and maintenance actions will be evaluated (see Section 4).

3.6 Site-Wide Inspection

The site-wide inspections for the features noted above in Sections 3.2 through 3.5 (soil cover system, stabilized riverbank, vegetation seeded or planted during restoration activities, and the undisturbed area) will be performed a minimum of once a year for the first four years. Site-wide inspections will also be performed after severe weather conditions (e.g., 25-year flood event) that may affect ECs. During

these inspections, a Site-wide Inspection Form will be completed (Appendix E). The form will compile sufficient information to assess the following:

- Compliance with all ICs;
- An evaluation of the condition and continued effectiveness of ECs, including signs of subsurface work/excavation, significant soil erosion, and/or survival of vegetation installed as part of restoration activities;
- General site conditions at the time of the inspection;
- The site management activities being conducted; and
- Confirm that site records are up to date (per Section 3.7).

3.7 Monitoring Quality Assurance/Quality Control

Monitoring quality assurance/quality control (QA/QC) will consist of documentation and field observation and review, and will be performed in accordance with the requirements in the EC/IC Plan (Section 2 of this SMP).

3.7.1 Documentation

Field personnel will provide documentation of the site-wide inspection. This documentation will consist of a record that allows reconstruction of the monitoring events to aid in development of the Periodic Review Reports and periodic certification. Documents, records, and information relating to the performance of the site-wide inspection will be retained by the Owner (i.e., the Town or any future owner) or the Owner's representative. For the first four years, original documentation will be maintained by Georgia-Pacific, and a copy of relevant documentation will be retained by the Owner. A Site-wide Inspection Form (Appendix E) will be completed for each inspection. Measurements and observations will be recorded on the Site-wide Inspection Form using ink, with no erasures. If an incorrect entry is made, the information will be crossed out with a single strike mark. Equipment used to make measurements will be identified, along with the date of calibration (if applicable). Entries onto the Site-wide Inspection Form will contain information necessary to complete the reporting, as discussed in Section 3.4.

3.7.2 Field Data Reduction and Review

Information collected in the field during the site-wide inspections through visual observation and/or manual measurement (e.g., of areas of erosion, areas of bare soil) will be reviewed by the Owner or implementing consultant on behalf of the Owner (i.e., the Town or any future Owner) for completeness and consistency. Concerns identified as a result of this review will be discussed with the field personnel, corrected if possible, and, as necessary, incorporated into the Periodic Review Report and/or periodic certification process.

Documents will be checked for:

- General completeness;
- Readability;
- Usage of appropriate methodology/procedures;
- Reasonableness in comparison to present and past data collected; and
- Correct calculations and interpretations, if any.

3.8 Monitoring Reporting Requirements

The Site-wide Inspection Form and other information generated during regular monitoring events and inspections (e.g., photos, other field notes) will be kept on file with the Owner (i.e., the Town or any future Owner) or with the Owner's representative. For the first four years, original documentation will be maintained by Georgia-Pacific, and a copy of relevant information will be retained by the Owner. All forms and other relevant reporting formats used during the monitoring/inspection events will be subject to approval by NYSDEC and submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP (Section 5).

Monitoring results will be reported to NYSDEC on a periodic basis in the Periodic Review Report. The report will include, at a minimum:

- Date of monitoring event;
- Personnel conducting monitoring;
- Description of the activities performed;
- Copies of field forms completed; and
- Observations, conclusions, or recommendations.

A summary of the monitoring program deliverables are summarized in the below Table:

Table 2 – Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Periodic Review Report	Annually
Inspection of Site	Annually

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

4. Maintenance Plan

The site remedy does not rely on mechanical systems to protect the environment; therefore, the operation and maintenance of such components is not included in this SMP. This maintenance plan is prepared in accordance with Section 6.2.3 of DER-10.

However, as discussed in Section 3, Georgia-Pacific will act as the Site Manager and implement the SMP for four years following completion of remedial construction activities. If issues are noted with respect to the performance criteria noted in Section 3 for the soil cover area, stabilized riverbank (including the inlet/outlet structure), and/or vegetation, the Site Manager will evaluate the observations and propose to NYSDEC appropriate corrective measures to ensure that the remedy continues to be effective based on the remedial goals for the Site, and will implement such measures upon approval by NYSDEC.

Specifically, should the monitoring reveal significant movement of riprap, areas with undercut banks, slope failure, and/or evidence of erosion (e.g., slope failure, ruts, gullies, washouts, or sloughing) of the stabilized riverbank, or if such significant issues are otherwise identified by the Site Manager in coordination with NYSDEC, the Site Manager will, upon NYSDEC approval, repair the areas. The obligation of maintenance of the area below the edge of water line is subject to provision of reasonable access to this area by the NYSDEC.

Similarly, if the performance criteria for the soil cover area related to erosion and/or issues with the performance of the soil cover itself are identified during the inspection or otherwise by the Site Manager in coordination with NYSDEC, the Site Manager will, upon NYSDEC approval, repair the areas. Such repairs may include, but are not limited to, placing additional soil cover material and/or erosion controls, as appropriate.

The maintenance activities for the vegetation on the soil cover area and other seeded or planted vegetation at the Site may include, but are not limited to, removal of vegetative species that appear to be adversely affecting the survival of the vegetation planted (for example, removal of vines growing on and affecting the survival of planted shrubs). Additionally, common reed (Phragmites australis), purple loosestrife (Lythrum salicaria), reed canary grass (Phalaris arundinacea), Japanese knotweed (Polygonum cuspidatum), Tartarian honeysuckle (Lonicera tatarica), Eurasian water-milfoil (Myriophyllum spicata), and/or other invasive species will be removed so that the areal coverage of such species is no more than a total of 5%, of the area restored. If there are signs of stress or sparse cover over more than 15% of the area

restored, the Site Manager, in consultation with NYSDEC, will evaluate the cause and the need to reseed and/or fertilize those areas, as appropriate. If more than 15% loss of shrubs is observed in the monitored areas, the Site Manager will replant the lost shrubs. Further, shrubs that are identified as stressed will be equipped with a tag identifying the date of the inspection and condition of the planting and will be subject to corrective measures (i.e., watering, fertilization), if appropriate.

In addition, for the undisturbed area monitored during the routine inspections, if significant bare spots are identified during the inspection or otherwise by the Site Manager in coordination with NYSDEC, the Site Manager will, upon NYSDEC approval, improve the area. Such improvements may include, but are not limited to, placing additional soil cover material and/or erosion controls and/or seeding the area, as appropriate.

NYSDEC will be notified prior to implementation of maintenance activities.

Given the wildflower seed mix selected by the Town, no regular mowing or other maintenance is contemplated.

After the four-year period during which Georgia-Pacific will act as the Site Manager and implement this SMP, the Town will become responsible for implementation. Maintenance activities to be considered after the initial four-year period will be selected by the Town in consultation with the NYSDEC.

5. Inspections, Reporting, and Certifications

5.1 Site Inspections

5.1.1 Inspection Frequency

As stated in Section 3 (Site Monitoring Plan) of this SMP, at a minimum, a site-wide inspection will be conducted annually and whenever a severe weather event has taken place, such as a flooding event that may affect the ECs.

5.1.2 Site-wide Inspection Forms, Sampling Data, and Maintenance Reports

As discussed in Section 3.3, all inspections and monitoring events will be recorded on the Site-wide Inspection Form (Appendix E), and may also be recorded in a field book.

All applicable inspection forms generated for the Site during the reporting period will be provided in electronic format in the Periodic Review Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site-wide monitoring event will be evaluated as part of the EC/IC certification to confirm that the:

- ECs/ICs are in place, are performing properly, and remain effective;
- The Site Monitoring Plan is being implemented; and, based on the above items; and
- The Site remedy continues to be protective of the environment and is performing as designed.

5.2 Certification of Engineering and Institutional Controls

After the last inspection of the reporting period, the Owner or a qualified environmental professional will prepare the following certification:

"For each EC/IC 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 IC/ECs required by the remedial program was performed under my direction;
- The IC/ECs employed at this Site are unchanged from the date the control was put in place, or last approved by the NYSDEC;
- Nothing has occurred that would impair the ability of the control to protect the environment;
- Nothing has occurred that would constitute a violation or failure to comply with any SMP for this control;
- Access to the Site will continue to be provided to the NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- Use of the Site is compliant with the Environmental Easement (Appendix A);
- The ECs 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;
- The information presented in this report is accurate and complete; and
- 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 am certifying as the Owner's Designated Site Representative."

The signed certification will be included in the Periodic Review Report described below in Section 5.3.

"For each IC identified for the Site, I certify that all of the following statements are true:

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

- Nothing has occurred that would impair the ability of the control to protect the environment;
- Nothing has occurred that would constitute a violation or failure to comply with any SMP for this control;
- Access to the Site will continue to be provided to the NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- Use of the Site is compliant with the environmental easement;
- The information presented in this report is accurate and complete; and
- 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 am certifying as the Owner's Designated Site Representative".

The Owner or Georgia-Pacific (as the Site Manager) may petition the NYSDEC for a determination that the IC/ECs may be terminated. Such petition will be supported by a statement by a professional engineer that such controls are no longer necessary for the protection of the environment.

5.3 Periodic Review Report

A Periodic Review Report will be submitted to NYSDEC every year by the first day of the month, following the anniversary of the start of the SMP, until the IC/ECs are terminated. 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 illustrated on Figure 1. The Periodic Review Report will be prepared in accordance with Section 6.3 of DER-10. The report will include, at a minimum:

- 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 inspection forms and other records generated for the Site during the reporting period, in electronic format;

- A summary of any monitoring data and/or information generated during the reporting period with comments and conclusions; and

- A Site evaluation, which includes the following:

    - The compliance of the remedy with the requirements of the site-specific RAWP and AOC;

    - Any new conclusions or observations regarding remaining black ash material at the Site based on inspections or data generated by the Site Monitoring Plan;

    - Recommendations regarding any necessary changes to the remedy and/or Site Monitoring Plan; and

    - The overall performance and effectiveness of the remedy.

The Periodic Review Report will be signed by the Owner, by a Professional Engineer or by such other qualified environmental professional as the NYSDEC may find acceptable and will contain a certification as provided at 6 NYCRR 375-1.8(h)(3). The Periodic Review Report will be submitted, in hard-copy and electronic format, to John Swartwout at the NYSDEC Office in Albany, and in electronic format to Christine Vooris of the New York State Department of Health Bureau of Environmental Exposure Investigation in Albany.

5.4 Corrective Measures 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 IC or EC, a corrective measures 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 plan until it is approved by the NYSDEC.

6. References

ARCADIS 2012a. Pre-Design Investigation Summary Report. Prepared for Georgia-Pacific LLC. January.

ARCADIS. 2012b. Remedial Action Work Plan. Prepared for Georgia-Pacific LLC. August.

ARCADIS. 2014. Final Engineering Report. Prepared for Georgia-Pacific LLC. November.

ESE. 2006. Site Investigation Report. Prepared for NYSDEC. November.

NYSDEC. 1994. Technical and Administrative Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels. HWR-94-4046. January 24.

NYSDEC. 1999. Technical Guidance for Screening Contaminated Sediments. January.

NYSDEC. 2006. 6 NYCRR Part 375: Environmental Remediation Programs. Effective December 14, 2006. Available online at: http://www.dec.ny.gov/docs/remediation_hudson_pdf/part375.pdf

NYSDEC. 2007. Record of Decision for the Willsboro Black Ash Pond Site. Willsboro, New York. March.

NYSDEC. 2008. 6 NYCRR Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations. Effective February 16, 2008. Available online at: http://www.dec.ny.gov/regs/4590.html

NYSDEC. 2010. NYSDEC DER-10: Technical Guidance for Site Investigation and Remediation. Issuance Date: May 3. Available online at: http://www.dec.ny.gov/regulations/67386.html.

NYSDEC. 2011a. Explanation of Significant Difference to the Final Record of Decision for Willsboro Black Ash Pond Site. Willsboro, New York. August.

NYSDEC. 2011b. Order on Consent and Administrative Settlement for the Willsboro Black Ash Pond Site (Index #A5-0771-07-11, Site # 516009). August 23.

NYSDEC, 2012a. Letter from C.B. Ng to Georgia-Pacific re: approval of the RAWP. September 6.

NYSDEC. 2012b. NYSDEC approval for Stream Disturbance – under Article 15 Title 5, Water Quality Certification – under Section 401 Clean Water Act, and Excavation and Fill in Navigable Waters – under Article 15 Title 5. September 17.

NYSDEC. 2012c. E-mail from C. B. Ng to NYSDEC (B. Schoch) and ARCADIS (L.S. Ketcham) re: Post-Construction Reports for Willsboro, NY. November 21.

NYSDEC. 2013a. NYSDEC Environmental Conservation Law. Available online at: http://public.leginfo.state.ny.us/LAWSSEAF.cgi?QUERYTYPE=LAWS+&QUERYDATA=@LLENV+&LIST=LAW+&BROWSER=EXPLORER+&TOKEN=13431318+&TARGET=VIEW.

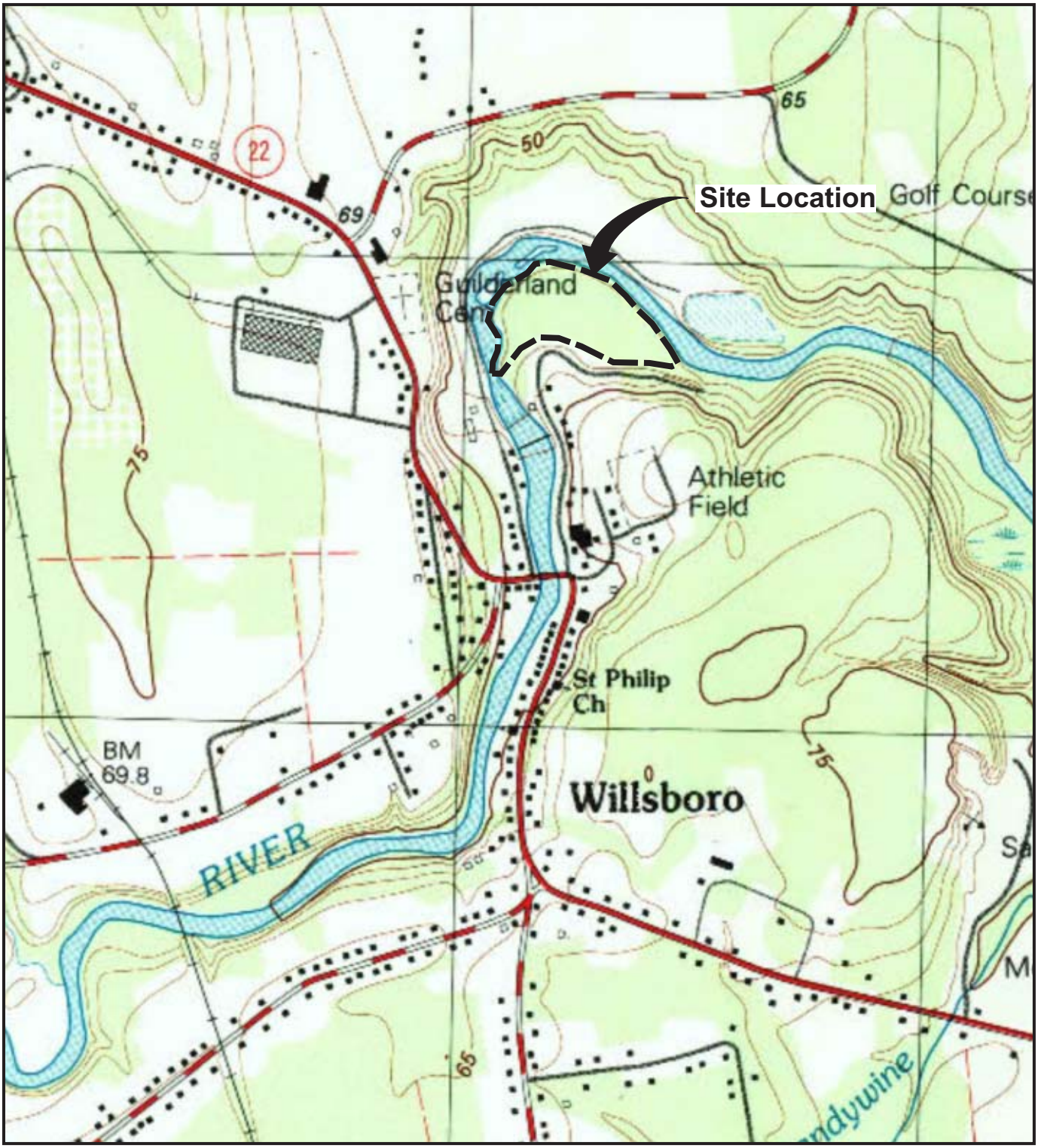
NYSDEC. 2013b. Letter from NYSDEC to Town of Willsboro (Edward Hatch) re: Willsboro Black Ash Pond, Site #516009, Periodic Review Report Certification. June 19, 2013.

Town. 1966. Quit Claim Deed. Essex County Clerk's Office Liber (Book) 453, Page 570. December 20.

Town. 2014. Environmental Easement. Essex County Clerk's Office Book 1779, Page 228. Recorded by the Town on December 2.

ARCADIS

Figures



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., WILLSBORO, NEW YORK - VERMONT 1999.

1000' 0 1000'

Approximate Scale: 1" = 1000'

GEORGIA-PACIFIC LLC
WILLSBORO, NEW YORK

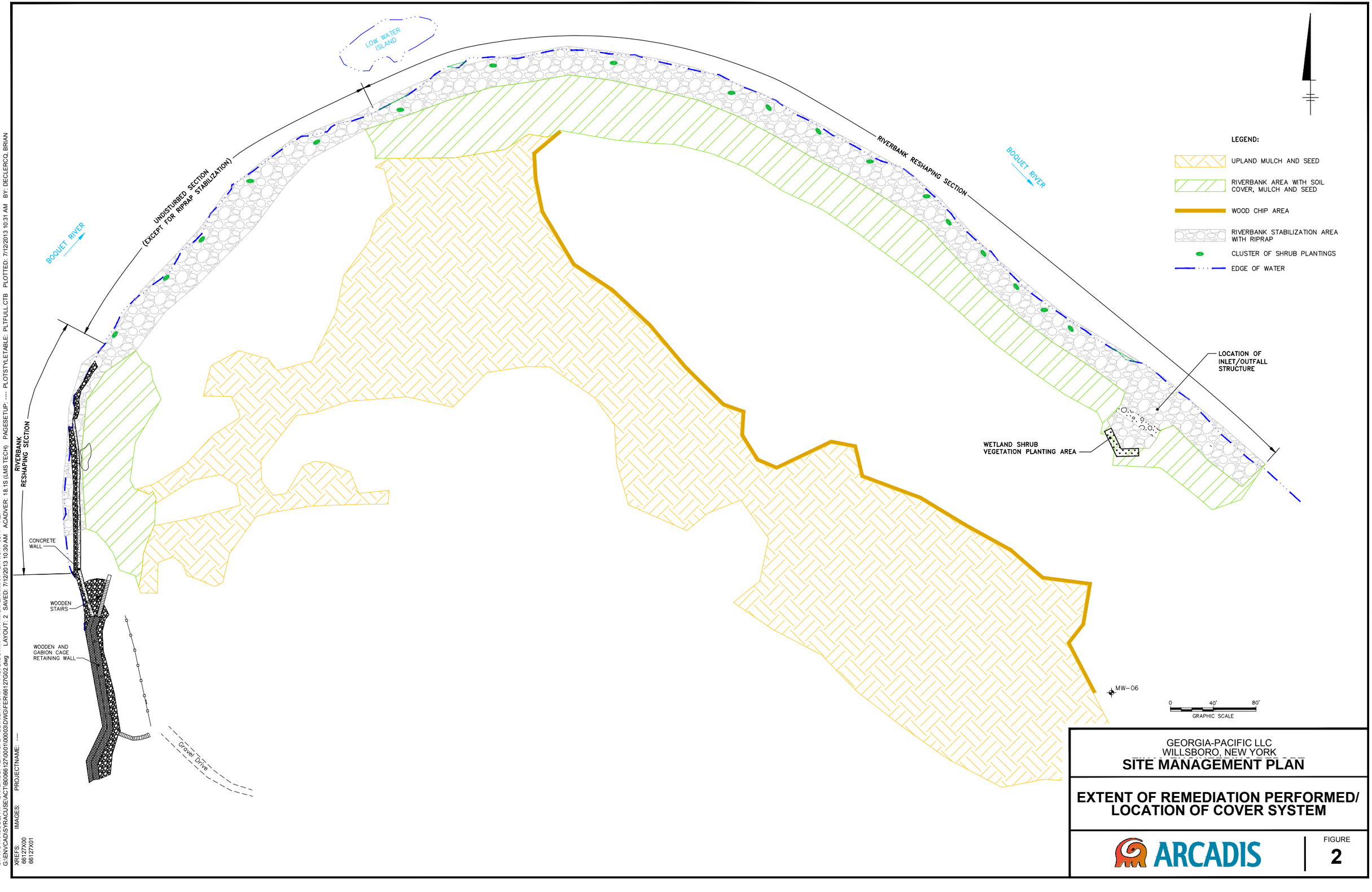
SITE MANAGEMENT PLAN

SITE LOCATION MAP

ARCADIS

FIGURE
1

03/13/2013 SYRACUSE, DIV/GROUP: ENV/IM-DV DJHOWES
B0066127/0001/00003/CDR/66127N01.CDR



GEORGIA-PACIFIC LLC
WILLSBORO, NEW YORK

SITE MANAGEMENT PLAN

EXTENT OF REMEDIATION PERFORMED/ LOCATION OF COVER SYSTEM

ARCADIS

FIGURE
2

CITY: SYRACUSE, NY DIV/GROUP: ENV/CAD DB: K.SARTORI PIC: D.COWIN PM/TM: D.PENNIMAN LYR:ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIB\0661270\0010000\03\DWG\FER\66127G02.dwg LAYOUT: 2 SAVED: 7/12/2013 10:30 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 7/12/2013 10:31 AM BY: DECLERCQ, BRIAN
XREFS: 66127X00 66127X01 IMAGES: PROJECTNAME: ---

Appendix A

Environmental Easement

ESSEX COUNTY – STATE OF NEW YORK

JOSEPH A. PROVONCHA, COUNTY CLERK
7559 COURT ST, PO BOX 247, ELIZABETHTOWN, NY 12932

COUNTY CLERK'S RECORDING PAGE
*****THIS PAGE IS PART OF THE DOCUMENT – DO NOT DETACH*****

BOOK/PAGE: 1779 / 228
INSTRUMENT #: 2014-3938

Receipt#: 2014129179
Clerk: SN
Rec Date: 10/02/2014 12:50:00 PM
Doc Grp: D
Descrip: EASEMENT
Num Pgs: 15
Rec'd Frm: TOWN OF WILLSBORO

Party1: WILLSBORO TOWN OF
Party2: NEW YORK STATE PEOPLE OF
Town: WILLSBORO

Recording:	
Cover Page	0.00
Recording Fee	0.00
Cultural Ed	0.00
Records Management - Coun	0.00
Records Management - Stat	0.00
TP584	0.00
Sub Total:	0.00
Transfer Tax	
Transfer Tax - State	0.00
Transfer Tax - County	0.00
Sub Total:	0.00
Total:	0.00

****** NOTICE: THIS IS NOT A BILL ******

***** Transfer Tax *****
Transfer Tax #: 350
Transfer Tax
Consideration: 0.00

Total: 0.00

I hereby certify that the within and foregoing was recorded in the Essex County Clerk's Office.

Joseph A. Provoncha
Essex County Clerk

Record and Return To:

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
OFFICE OF GENERAL COUNSEL, 14TH FLOOR
625 BROADWAY
ALBANY, NY 12233-1500

****Notice** Information may change during the verification process and may not be reflected on this page**

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

THIS INDENTURE made this 16th day of September, 2014 between Owner(s) The Town of Willsboro, having an office at P.O. Box 370, Willsboro, County of Essex, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

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

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

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

WHEREAS, Grantor, is the owner of real property located at the address of School Street in the Town of Willsboro, County of Essex and State of New York, known and designated on the tax map of the County Clerk of Essex as tax map parcel numbers: Section 031.09 Block 01 Lot 20-1, being the same as that property conveyed to Grantor by deed dated December 20, 1966 and recorded in the Essex County Clerk's Office in Liber 453 and Page 570. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 26.65 +/- acres, and is hereinafter more fully described in the Land Title Survey dated September 16, 1966 prepared by Spencer J. Johnston, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of State Assistance Contract Number: C302572, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

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

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

A. (1) The Controlled Property may be used for:
The area set forth in the Schedule B may continue to be utilized as set forth in Schedule B in addition, the entire parcel may be used for Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

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

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

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Essex County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

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

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

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

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

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

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

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

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

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

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

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

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation

Law.

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

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

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

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

(i) are in-place;

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

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

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

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

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

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

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

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

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

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

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by

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

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

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

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

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

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

Parties shall address correspondence to:

Site Number: 516009
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

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

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

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

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

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

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

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

Town of Willsboro:

By: _____

Print Name: Shaun Gilliland

Title: Supervisor Date: 9/11/14

Grantor's Acknowledgment

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

On the 11th day of September, in the year 20 14, before me, the undersigned, personally appeared Shawn Gilliland, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public - State of New York

BRIDGET A. BROWN
Notary Public - State of New York
No. 01BR6295202
My Commission Expires December 30, 2017

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

By: _____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

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

On the 16th day of September, in the year 2014, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

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

SCHEDULE "A" PROPERTY DESCRIPTION

Enter Property Description

FORM 38 N. Y. DEED—QUIT CLAIM (FROM A CORPORATION)
(Laws of 1911, Chap. 491, Statutory Form DD)

TUTEBLANK REGISTERED U.S. PAT. OFFICE
Tuttle Law Print, Publishers, Rutland, Vt.

BOOK 453 PAGE 570

This Indenture,

Made the 20th *day of* December *Nineteen Hundred and* Sixty-six,

Between GEORGIA-PACIFIC CORPORATION

a corporation organized under the laws of the State of Georgia

party of the first part, and

TOWN OF WILLSBORO, ESSEX COUNTY, NEW YORK,

party of the second part,

Witnesseth, *that the party of the first part, in consideration of*

----------ONE----------*Dollar*

($1.00---------) *lawful money of the United States,*

paid by the party of the second part,

does hereby remise, release, and quitclaim unto the party of the second part,

its successors *and assigns forever, all*

ALL THAT CERTAIN PARCEL OR TRACT OF LAND situate, lying and being on the south side of the big bend of the Bouquet River in the hamlet and Town of Willsboro, said tract being generally known as the "Black Ash Pit" and being bounded and described as follows: BEGINNING at a point in part of the southerly bounds of the tract herein described and conveyed, said point being monumented by a 1/2" iron pipe driven into the ground on the east side of the road or street that runs northerly from the Willsboro Branch of the Essex County-Champlain National Bank building in Willsboro into the tract herein described and being located N 5° 26' E, 108.0 feet from another 1/2" iron pipe monument marking the northwest corner of a house lot owned or occupied by a certain F. Bridge; thence running in a course directly toward and in alignment with the so-called "Lower Dam" of the mill on the Bouquet River or S 70° 03' W, 247.18 feet to a point-on-line monumented by the northwest corner of the concrete dam abutment on the east bank of the Bouquet River; and thence continuing in the same course along the broken crest of said dam an additional 73 feet, more or less, to a point in the center line of said River, said point being the southwest corner of the tract herein described and conveyed; thence running northerly, easterly and southeasterly down and along the center line of said big bend in the Bouquet River as the same winds and turns a distance of 3000 feet, more or less, to a point being the most easterly corner of the tract herein described and conveyed, said point being located N 20° 10' E, 50 feet, more or less, from a 1/2" iron pipe monument driven into the ground on the south bank of the River and at the base of a large sycamore tree; thence running S 20° 10' W, 50 feet, more or less, to the point-on-line marked by said 1/2" iron pipe at the Sycamore tree; and thence continuing in the same course S 20° 10' W, an additional 129.66 feet to a point in the northerly bounds

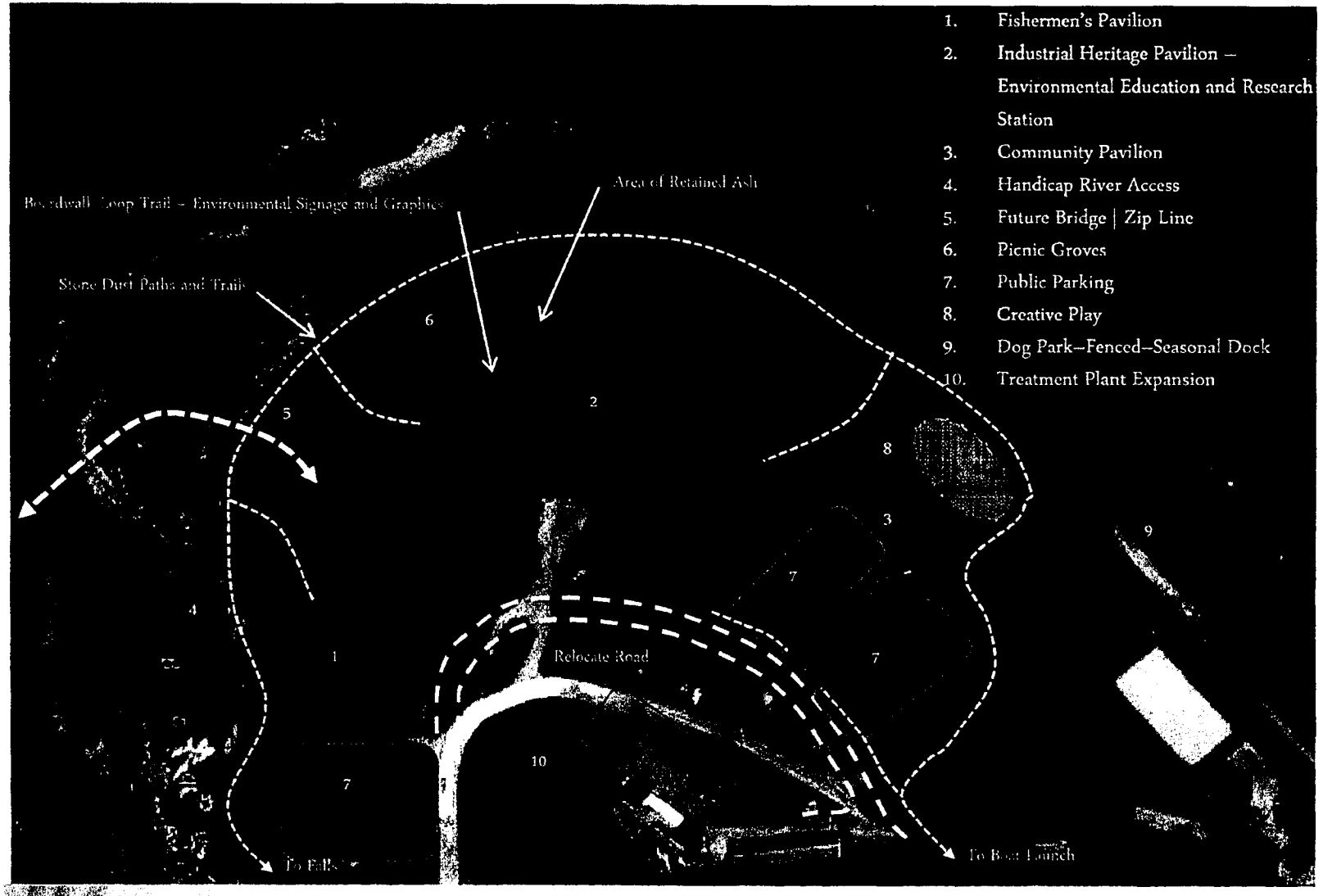
of other lands owned by the party of the first part hereto, said point being the southeast corner of the tract herein described and conveyed and being monumented by another 1/2" iron pipe driven into the ground on the easterly side of an unimproved roadway reserved by the party of the first part hereto as a right-of-way for ingress and egress to lands owned south and east of the tract herein described; thence running westerly along the northerly bounds of other lands owned by the party of the first part hereto and along the southerly side of said roadway reserved as a right-of-way the following courses and distances, viz; N 78° 52' W, 250.52 feet to a corner monumented by a 1/2" iron pipe driven into the ground; thence N 52° 35' W, 364.43 feet to another corner on the south edge of said roadway right-of-way monumented by a 1/2" iron pipe driven into the ground; thence N 70° 59' W, 532.20 feet to another corner monumented by a 1/2" iron pipe and piled stones set in the ground; thence N 34° 20' W, 260.62 feet to another corner on the south side of said roadway monumented by a 1/2" iron pipe driven into the ground; thence N 86° 19' W, 130.11 feet to another corner monumented by a 1/2" iron pipe driven into the ground on the south side of said roadway; and thence S 14° 20' W, 172.24 feet to the point or place of beginning; containing 25.0 acres of land and river within the bounds of the tract thus traversed, described and conveyed;

The above described magnetic courses, distances and monuments are those determined and established in a survey completed September 16, 1956 by Spencer J. Johnston and Frederick W. Volckmann, licensed land surveyors. Reference is made to the map plotted from said survey for a more detailed and graphic description of the tract herein described and conveyed. Said map is titled: "Map of Survey - showing parcel set off from lands of Georgia Pacific Corp. to be conveyed to the Town of Willsboro" and is placed on file at the Essex County Clerk's office as Map No. 2092 in Book 24 of Maps at page 31.

Reserving to the grantor herein an unrestricted right-of-way for ingress and egress by foot, vehicles or otherwise upon, through and over the roadway designated as a right-of-way reserved to the grantor in the aforesaid survey.

SCHEDULE B
(MAPS)

Black Ash Park – Concept Master Plan

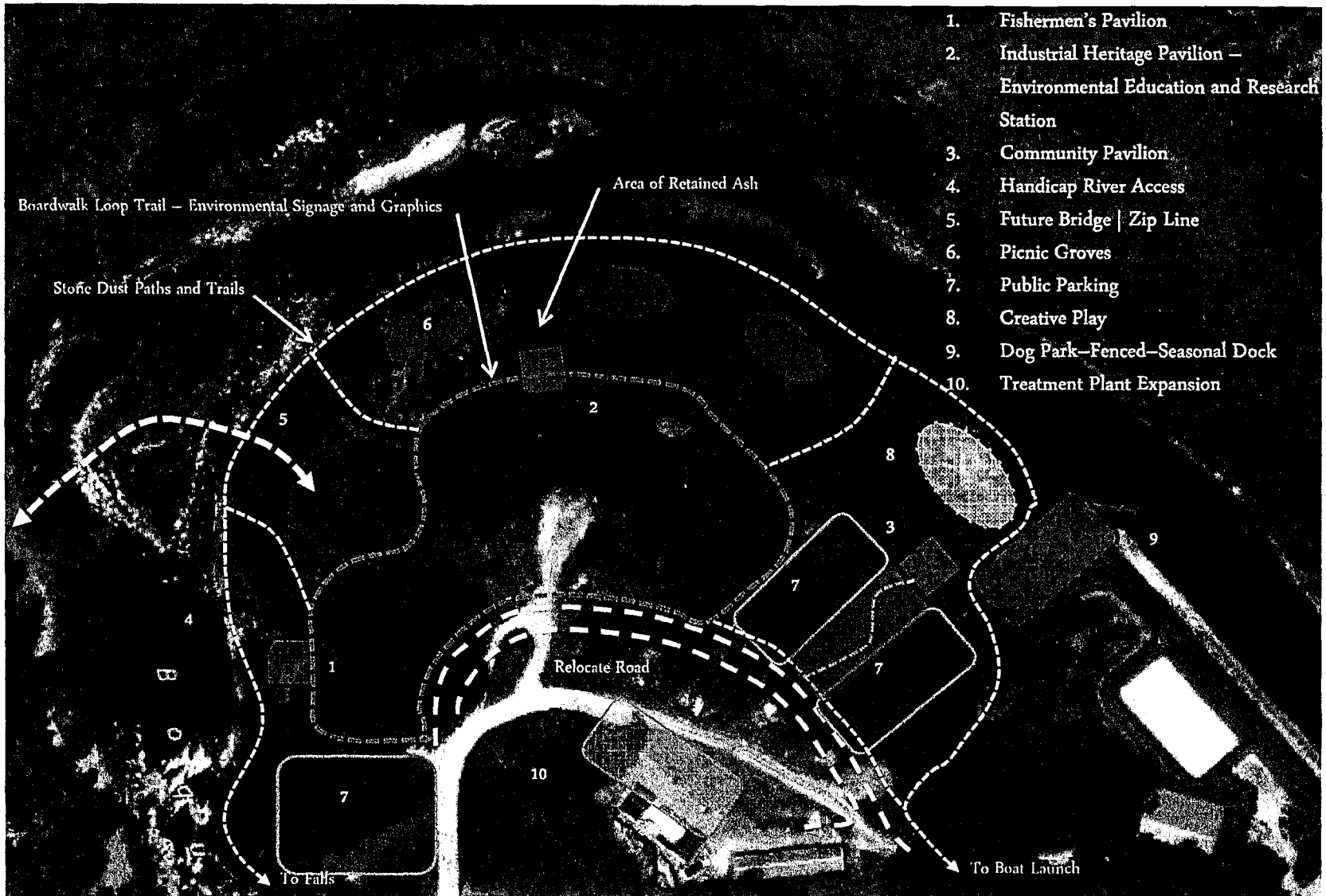


Wellsboro

4-3-2012

William W. Palmer, ASLA

Black Ash Park – Concept Master Plan



Willsboro NY

4-3-2012

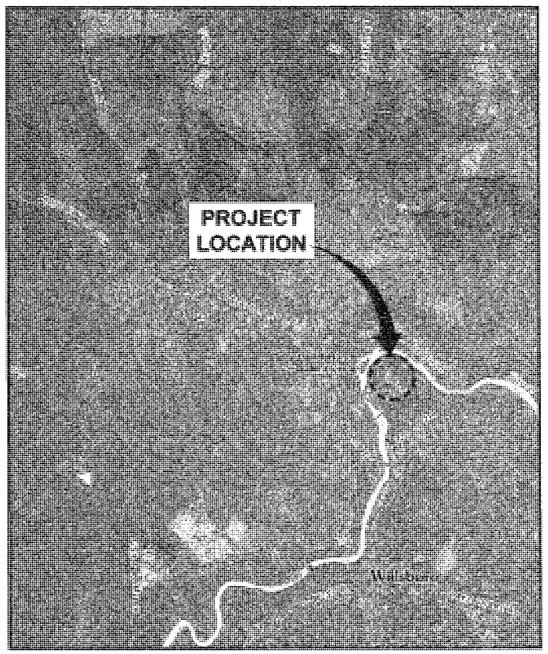
William W. Palmer, ASLA

Appendix B

As-Built Record Drawings

RECORD DRAWINGS

WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT



REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE., WILLSBORO, PORT DOUGLASS, N.Y., 2010.

LOCATION MAP

0 1500' 3000'
GRAPHIC SCALE

NEW YORK

GEORGIA-PACIFIC LLC
WILLSBORO, NEW YORK

DATE ISSUED
JULY 2013

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE 7/9/13 BY MOG

(RECORD DRAWING: MADE FROM COVER SHEET, G:\ENVCAD\SYRACUSE\ACT\B0066127\0001\00002\DWG\B0066127Q01, DATED 9/5/2012)

ARCADIS

ARCADIS OF NEW YORK, INC.

INDEX TO DRAWINGS

GENERAL NOTES:

1. BASE MAP AND EXISTING SITE PLAN DEVELOPED FROM AN INSTRUMENT SITE SURVEY COMPLETED BY THEW ASSOCIATES ON NOVEMBER 22, 2011. AS-BUILT SURVEY WAS COMPLETED BY GEOMATICS LAND SURVEYING, PC ON NOVEMBER 15, 2012.
2. THE BASE MAP IS REFERENCED HORIZONTALLY TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) AND PROJECTED ON THE NEW YORK STATE PLANE COORDINATE SYSTEM (EAST ZONE) AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). ELEVATIONS AND CONTOURS SHOWN REFERENCE NAVD88-GEOID09.
3. NORTH ARROW AS SHOWN INDICATES GRID NORTH REFERENCED TO NAD83 AND PROJECTED ON THE NEW YORK STATE PLANE COORDINATE SYSTEM (EAST ZONE).
4. THE REFERENCE HORIZONTAL AND VERTICAL CONTROL STATION IS A COOPERATIVE BASE NETWORK CONTROL STATION MONUMENT STAMPED "KEESVILLE". KEESVILLE IS AN A ORDER HORIZONTAL AND A SECOND ORDER CLASS 2 CONTROL MONUMENT ESTABLISHED BY THE NATIONAL GEODETIC SURVEY. ELEVATION = 490.87'.
5. CONTOURS SHOWN ON THE EXISTING SITE PLAN BASE MAP WERE GENERATED FROM A DIGITAL TERRAIN MODEL UTILIZING AUTODESK LAND DESKTOP SURVEYING AND ENGINEERING SOFTWARE.
6. THE SLOPE ALONG THE SOUTHERLY EDGE OF THE EXPOSED BLACK ASH AREA IS MOSTLY COMPRISED OF ROOT BALLS, CONCRETE, TRASH, CONSTRUCTION MATERIALS AND OTHER DEBRIS.
7. THE STATIONING SHOWN AT THE CROSS SECTIONS PROTRUDING INTO THE RIVER ARE APPROXIMATE AND FOR REFERENCE ONLY. THE CROSS SECTIONS ARE MARKED BY LATH SET DURING THE SURVEY MARKED WITH THE APPROPRIATE STATION. THERE WAS NO BASELINE ESTABLISHED DURING THE SURVEY.
8. THE CONTRACTOR WILL BE PRESENT AT A PRE-CONSTRUCTION CONFERENCE BEFORE THE WORK IS STARTED.
9. THE LOCATION OF ALL STRUCTURES/UTILITIES SHOWN IS APPROXIMATE. ADDITIONAL SITE FEATURES MAY BE PRESENT THAT ARE NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES PRIOR TO COMMENCING CONSTRUCTION.
10. UNLESS NOTED OTHERWISE, ALL STRUCTURES AND SITE FEATURES, INCLUDING MONITORING WELLS, FENCING, AND ESTABLISHED VEGETATION SHALL BE PROTECTED. VEGETATION EXISTING WITHIN THE LIMITS OF THE EXPOSED BLACK ASH AREA WILL BE CLEARED.
11. LOCATIONS OF ALL PHYSICAL OBSTRUCTIONS AND DEBRIS ARE APPROXIMATE. ONLY KNOWN OBSTRUCTIONS ARE SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL OBSTRUCTIONS WITHIN THE WORK AREA.
12. THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN SURVEY CONTROL DURING THE PERFORMANCE OF WORK.
13. THE CONTRACTOR WILL COMPLY WITH ALL REQUIREMENTS OF SEPARATELY BOUND PROJECT IMPLEMENTATION PLANS AND PERMITS.
14. FILL AND STONE GRADATIONS ARE PROVIDED IN TECHNICAL SPECIFICATIONS.
15. THE CONTRACTOR WILL AT ALL TIMES KEEP THE CONSTRUCTION AREAS FREE FROM ACCUMULATIONS OF WASTE MATERIALS OR RUBBISH; AND PRIOR TO COMPLETION OF THE WORK, REMOVE ANY RUBBISH FROM THE PREMISES AND ALL TOOLS, EQUIPMENT AND MATERIALS.
16. THE CONTRACTOR WILL MAINTAIN SUITABLE TRAFFIC SAFETY SIGNS, EQUIPMENT, AND MANPOWER TO PROVIDE TRAFFIC CONTROL. THE CONTRACTOR WILL PROVIDE ALL LABOR AND EQUIPMENT NECESSARY TO MAINTAIN THE ROADWAYS FREE OF DIRT AND/OR DEBRIS RESULTING FROM PROJECT OPERATIONS.
17. BENCHMARKS: THE CONTRACTOR WILL USE THE BASELINE AND BENCHMARK LOCATIONS NOTED IN THE CONTRACT DRAWINGS AS THE CONTROLLING HORIZONTAL AND VERTICAL MONUMENTS FOR CONSTRUCTION, RESPECTIVELY.
18. PRIOR TO CONSTRUCTION AND UPON COMPLETION, THE CONTRACTOR WILL CONDUCT A GENERAL CLEANUP OF THE SITE TO INCLUDE FLOATING DEBRIS, DEBRIS WASHED ASHORE, REFUSE, AND OTHER ITEMS AND WILL PROPERLY DISPOSE OF ALL DEBRIS.
19. REMOVE AND STOCKPILE EXISTING RIPRAP FROM SHORELINE AS NECESSARY TO ACCESS THE WORK AREA AND COMPLETE WORK. REPLACE RIPRAP AFTER CONSTRUCTION IS COMPLETE.
20. THE EXISTING FENCE WILL BE REMOVED AS NECESSARY TO ACCESS THE WORK AREA. ANY FENCE REMOVED WILL BE REPLACED DURING RESTORATION ACTIVITIES.
21. FINAL PLACEMENT OF EROSION AND SEDIMENTATION CONTROLS WILL DEPEND ON THE CONTRACTOR'S SELECTED ACCESS AND STAGING LAYOUTS. AT A MINIMUM, SILT FENCE WILL BE PLACED ALONG DOWNGRADIENT SIDE OF ALL ACCESS ROADS, AND AROUND ALL STAGING/DECONTAMINATION AREAS. THE CONTRACTOR IS RESPONSIBLE FOR ANY SEDIMENT AND EROSION CONTROL MEASURES REQUIRED BY REGULATORY AUTHORITY REGARDLESS OF WHETHER OR NOT THEY ARE EXPLICITLY STATED IN THE CONTRACT DOCUMENTS.
22. THE CONTRACTOR WILL INSTALL AND MAINTAIN TURBIDITY CONTROL THROUGHOUT REMEDIAL ACTIVITIES.
23. THE CONTRACTOR WILL TAKE DAILY PRECAUTIONS TO MINIMIZE MATERIAL RELEASES INTO THE RIVER DURING CONSTRUCTION.
24. REMOVED MATERIAL PLACEMENT: GEORGIA-PACIFIC LLC WILL NOT APPROVE DEPOSITION OF REMOVED MATERIAL IN PLACES OTHER THAN THOSE DESIGNATED ON THE DRAWINGS OR OTHERWISE PREVIOUSLY APPROVED, AND MAY REQUIRE THE CONTRACTOR TO MOVE SUCH MISPLACED MATERIAL AT HIS OWN EXPENSE. WHEN NOTIFIED BY GEORGIA-PACIFIC LLC, EITHER TO HIS OFFICE OR HIS FOREMAN AT THE JOB SITE, OF ANY VIOLATION OF THE FOREGOING PROVISIONS, THE CONTRACTOR WILL TAKE IMMEDIATE CORRECTIVE ACTION. SHOULD THE CONTRACTOR REFUSE OR FAIL TO PROMPTLY CORRECT SUCH VIOLATION, GEORGIA-PACIFIC LLC MAY ORDER ALL OR PART OF THE WORK STOPPED PENDING CORRECTION. THE CONTRACTOR WILL NOT CLAIM OR BE ENTITLED TO AN EXTENSION OF CONTRACT COMPLETION TIME, EXCESS COSTS OR DAMAGES DUE TO TIME LOST BY SUCH A STOP WORK ORDER.
25. RESTORE NEW ACCESS POINTS TO EXISTING CONDITIONS AT A MINIMUM. RESTORE DISTURBED AREAS WITH IN-KIND PLANTINGS, AS NECESSARY.
26. UPON COMPLETION OF THE CONSTRUCTION, THE CONTRACTOR WILL LEAVE THE WORK AREA IN A CLEAN, NEAT AND ORDERLY CONDITION. DISTURBED AREAS WILL BE RESTORED IN ACCORDANCE WITH CONTRACT DRAWINGS AND APPLICABLE TECHNICAL SPECIFICATIONS.
27. THE BOUNDARY OF THE SITE WORK ZONES WILL BE DELINEATED BY THE CONTRACTOR WITH CAUTION TAPE, SAFETY FENCING, TRAFFIC CONES, BARRICADES, SIGNS, OR OTHER MEANS AS NECESSARY TO EFFECTIVELY IDENTIFY THE BOUNDARIES. THE SIZE AND BOUNDARY OF THE EXCLUSION ZONE WILL BE MODIFIED DAILY (OR MORE FREQUENTLY AS NEEDED) TO DELINEATE THE AREA AS REQUIRED TO SAFELY ACCOMPLISH THE DAY'S PLANNED ACTIVITIES.
28. THE CONTRACTOR SHALL, TO THE EXTENT PRACTICABLE, COMPLETE ALL IN-WATER ACTIVITIES BY SEPTEMBER 15, 2012. ALL IN-WATER ACTIVITIES MUST BE COMPLETED BY OCTOBER 1, 2012, UNLESS SPECIAL PERMISSION IS REQUESTED FROM AND APPROVED BY THE OWNER. UPLAND WORK MAY PROCEED PAST THESE DATES.
29. IF CONSTRUCTION ACTIVITIES (IN-WATER OR UPLAND ACTIVITIES) CONTINUE BEYOND SEPTEMBER 15, 2012, THE CONTRACTOR MUST INSTALL SIGNS TO DIRECT ANGLERS TO THE APPROPRIATE LOCATION(S) TO OBTAIN ACCESS TO THE BOQUET RIVER WITHOUT CROSSING WITHIN THE LIMITS OF THE CONSTRUCTION SITE, AS ESTABLISHED BY THE CONTRACTOR. EVERY ATTEMPT SHALL BE MADE BY THE CONTRACTOR TO PROHIBIT PERSONS NOT AFFILIATED WITH THE CONSTRUCTION ACTIVITIES FROM TRESPASSING ON TO THE CONSTRUCTION SITE.
30. IF SEVERE WEATHER IS PREDICTED IN THE FORECAST, THE CONTRACTOR SHALL MOVE ALL CONSTRUCTION VEHICLES INTO A DESIGNATED PARKING AREA ON HIGHER GROUND AND AWAY FROM THE RIVERBANK. IN ADDITION, IF THE SEVERE WEATHER IS PREDICTED TO OCCUR OUTSIDE OF REGULARLY-SCHEDULED WORK HOURS, AT THE END OF THE WORK DAY THE CONTRACTOR SHALL MOVE ALL CONSTRUCTION VEHICLES INTO SUCH DESIGNATED PARKING AREA FOR OVERNIGHT STORAGE.
31. THE CONTRACTOR SHALL SUFFICIENTLY CLEAN ALL CONSTRUCTION EQUIPMENT PRIOR TO MOBILIZING SUCH EQUIPMENT ON TO THE SITE, AND SHALL EMPLOY ALL BEST MANAGEMENT PRACTICES NECESSARY TO PREVENT THE TRANSPORT OF INVASIVE SPECIES ON TO THE SITE, AND SPECIFICALLY IN TO THE WETLAND AREA ON THE SITE.

ABBREVIATIONS:

BM	–	BENCHMARK
EL	–	ELEVATION
HDPE	–	HIGH DENSITY POLYETHYLENE
H:V	–	HORIZONTAL: VERTICAL
MAX	–	MAXIMUM
NAD83	–	NORTH AMERICAN DATUM OF 1983
NGVD29	–	NATIONAL GEODETIC VERTICAL DATUM OF 1929
PDI	–	PRE-DESIGN INVESTIGATION
STA	–	STATION
TYP.	–	TYPICAL

SURVEY BENCHMARKS			
LOCATION	NORTHING	EASTING	ELEVATION
BM-1	2019144.2681	782163.0148	119.51
BM-2	2018814.0094	782825.1409	105.53

BM-1:

YELLOW BENCHTIE SET IN THE EASTERLY FACE OF A 2 BOLE 28-INCH ASPEN TREE, LOCATED APPROXIMATELY 80' SOUTHERLY OF THE SOUTHERLY EDGE OF THE BOQUET RIVER, AND APPROXIMATELY 18' NORTHERLY OF THE MOST NORTHERLY END OF THE EXPOSED BLACK ASH. ELEVATION = 119.51'

BM-2:

RAILROAD SPIKE FOUND IN THE SOUTHERLY FACE OF A 20-INCH ASPEN TREE, LOCATED APPROXIMATELY 55 FEET SOUTHERLY OF THE SOUTHERLY EDGE OF THE BOQUET RIVER, AND ALSO LOCATED APPROXIMATELY 135 FEET NORTHERLY OF THE EASTERLY END OF THE EXPOSED BLACK ASH AREA. ELEVATION = 105.53'

LEGEND:

- CONTOUR MAJOR
- CONTOUR MINOR
- EXISTING FENCE LINE
- WOODEN FENCE
- TURBIDITY CONTROLS (3 / G-207)
- EROSION AND SEDIMENT CONTROL (1 / G-207) (2 / G-207)
- TEMPORARY ACCESS PAD (1 / G-206)
- TEMPORARY STAGING AREA (2 / G-206)
- TEMPORARY LOCATION FOR CONSTRUCTION TRAILERS/SUPPORT FACILITIES
- EQUIPMENT CLEANING AREA (3 / G-206)
- RIVERBANK STABILIZATION AREA
- RIPRAP
- UPLAND MULCH AND SEED
- RIVERBANK STABILIZATION AREA WITH SOIL COVER, MULCH AND SEED
- WOOD CHIP AREA
- GRAVEL AREA
- RIVERBANK STABILIZATION AREA WITH RIPRAP
- ACCESS ROAD (4 / G-206)
- EDGE OF WATER
- LIMITS OF EXPOSED BLACK ASH
- DRIP LINE OF MATURE WOODS
- EDGE OF GRAVEL
- EDGE OF TREES/BRUSH
- PDI-B-3 SOIL BORING
- MW-04 MONITORING WELL (MW)
- TP-10 TEST PIT (TP)
- WETLAND DELINEATION BOUNDARY
- + W2-7 WETLAND DELINEATION FLAG NUMBER
- LIMIT OF AS-BUILT SURVEY

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

(RECORD DRAWING: MADE FROM DRAWING NO. G-100, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G100, DATED 8/2/2012) DATE 7/9/13 BY MOG

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name	MARK O. GRAVELDING		
Professional Engineer's No.	069985-1		
State	Date Signed	Project Mgr.	
NY	7/9/13	LSK	
Designed by	Drawn by	Checked by	
LJP	BKD	LSK	

STATE OF NEW YORK · MARK OWEN GRAVELDING · 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK
WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT

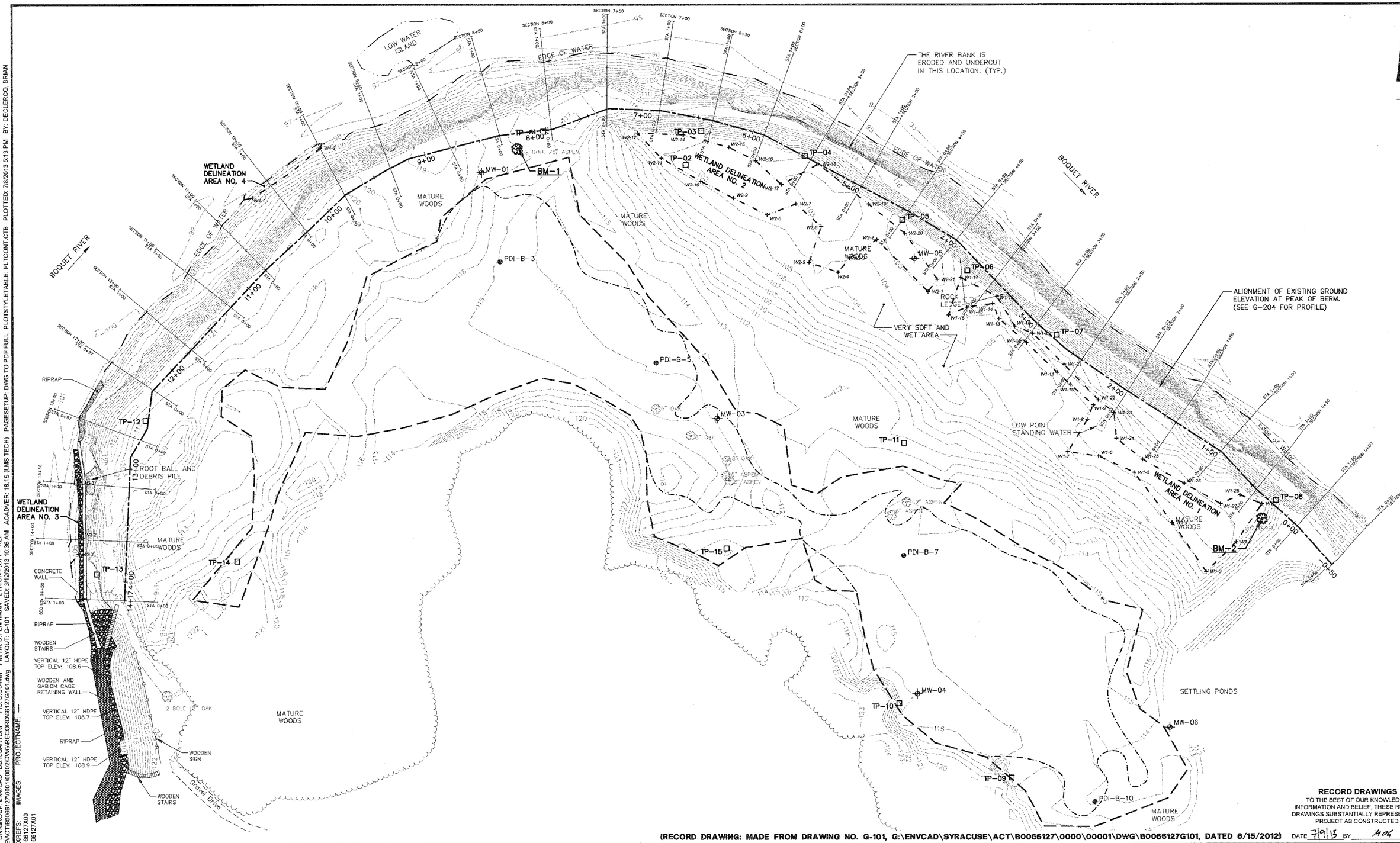
GENERAL NOTES, LEGEND, AND ABBREVIATIONS

GENERAL

ARCADIS Project No.	B0066127.0001.00002
Date	JULY 2013

ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
TEL. 315.446.9120

G-100



RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.
DATE 7/9/13 BY MG

(RECORD DRAWING: MADE FROM DRAWING NO. G-101, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G101, DATED 6/15/2012)

40' 0 40' 80'
1"=40'

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No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 7/9/13 | Project Mgr.: LSK
Designed by: LJP | Drawn by: BKD | Checked by: LSK

STATE OF NEW YORK MARK OREN GRAVELDING NO. 069985 LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK
WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT

PRE-CONSTRUCTION SITE PLAN

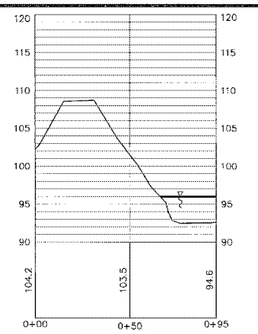
GENERAL

ARCADIS Project No.: B0066127.0001.00002
Date: JULY 2013

ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
TEL. 315.446.9120

G-101

PROJECT WORK LIMITS



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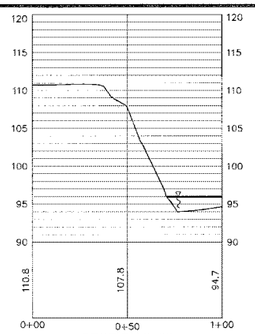

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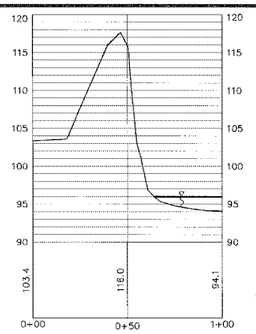

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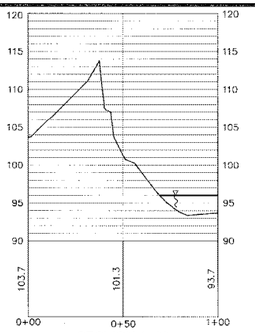

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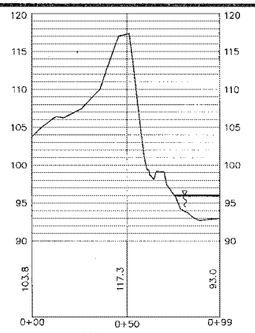

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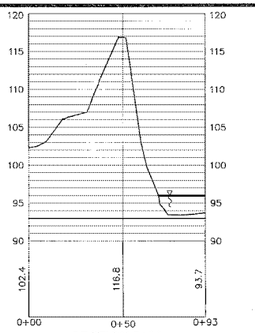

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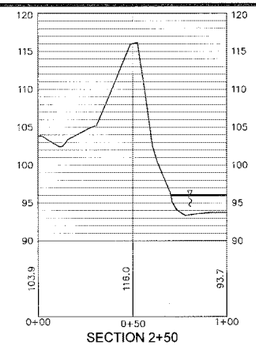

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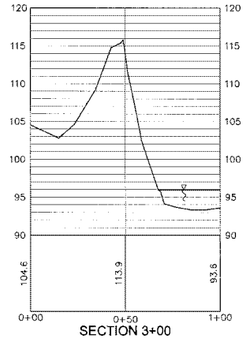

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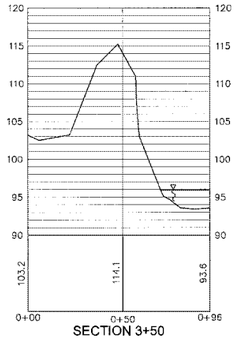

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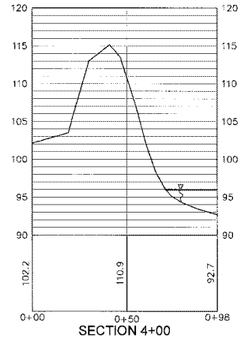

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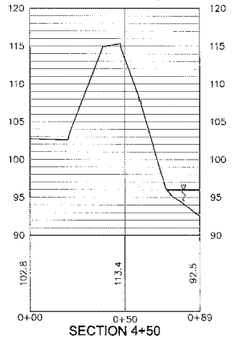

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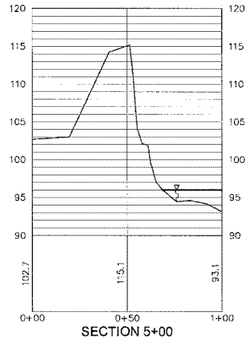

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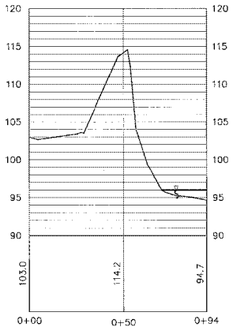

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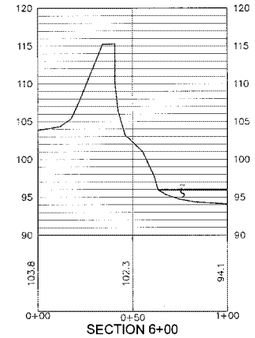

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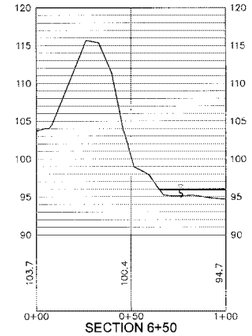

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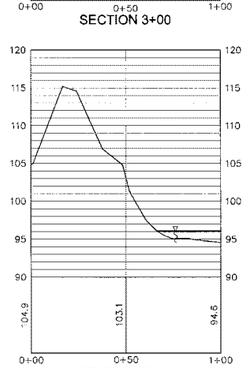

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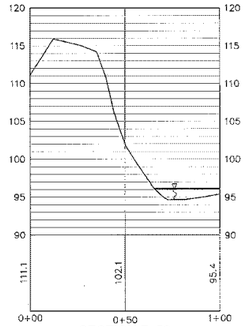

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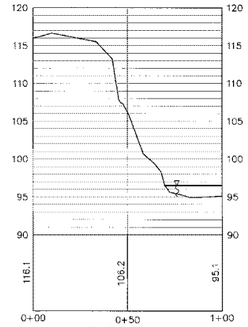

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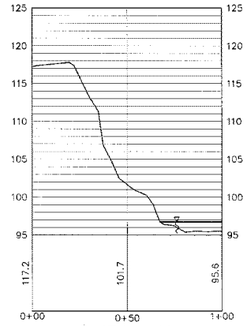

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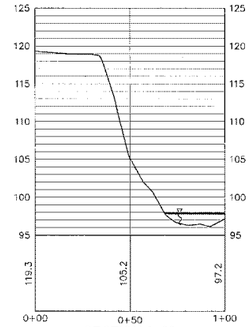

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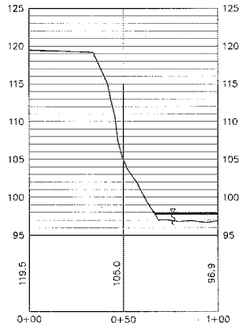

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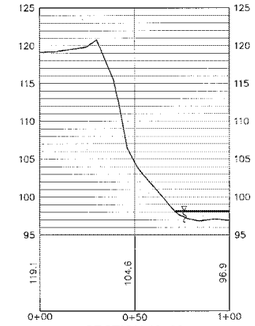

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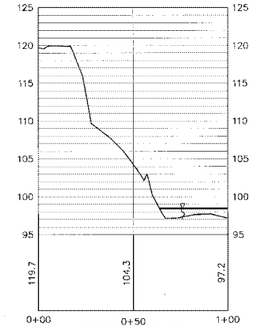

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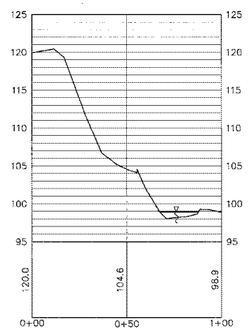

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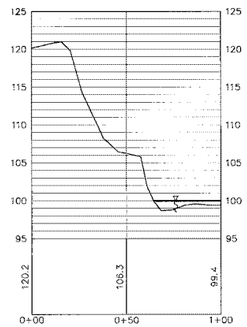

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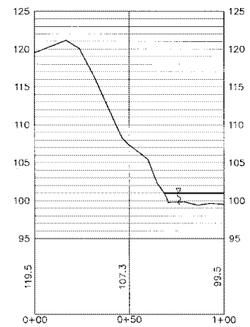

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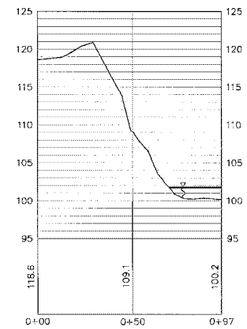

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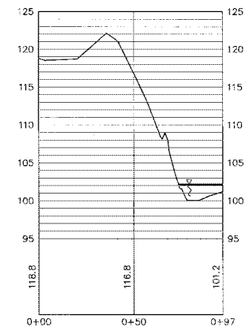

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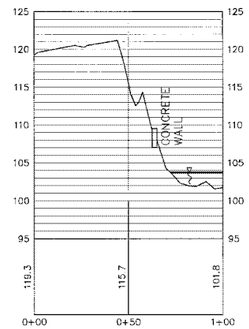

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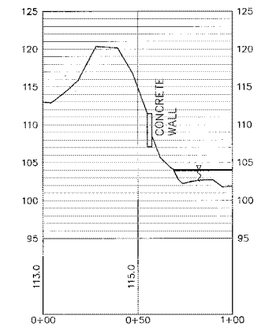


SECTION 14+00

LEGEND:

EXISTING GROUND

WATER SURFACE (AS MEASURED ON 11/22/11)

NOTE:

1. STATION 0+00 REFERENCE IS NOT A STANDARD DISTANCE FROM THE CENTERLINE OF THE EXISTING BERM.
2. PLEASE NOTE VERTICAL SCALE IS SHOWN AT A 4x EXAGGERATION.

RECORD DRAWINGS

TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE 7/9/13 BY MG

(RECORD DRAWING: MADE FROM DRAWING NO. G-102, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G102, DATED 8/3/2012)

HORIZONTAL SCALE 1"=40'

VERTICAL SCALE 1"=10'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd.

Professional Engineer's Name: MARK O. GRAVELDING

Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	7/9/13	LSK
Designed by	Drawn by	Checked by
LJP	BKD	LSK

STATE OF NEW YORK — MARK OWEN GRAVELDING — 069985 — LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK

WILLSBORO BLACK ASH POND

FINAL ENGINEERING REPORT

CROSS SECTIONS - PRE-CONSTRUCTION CONDITIONS

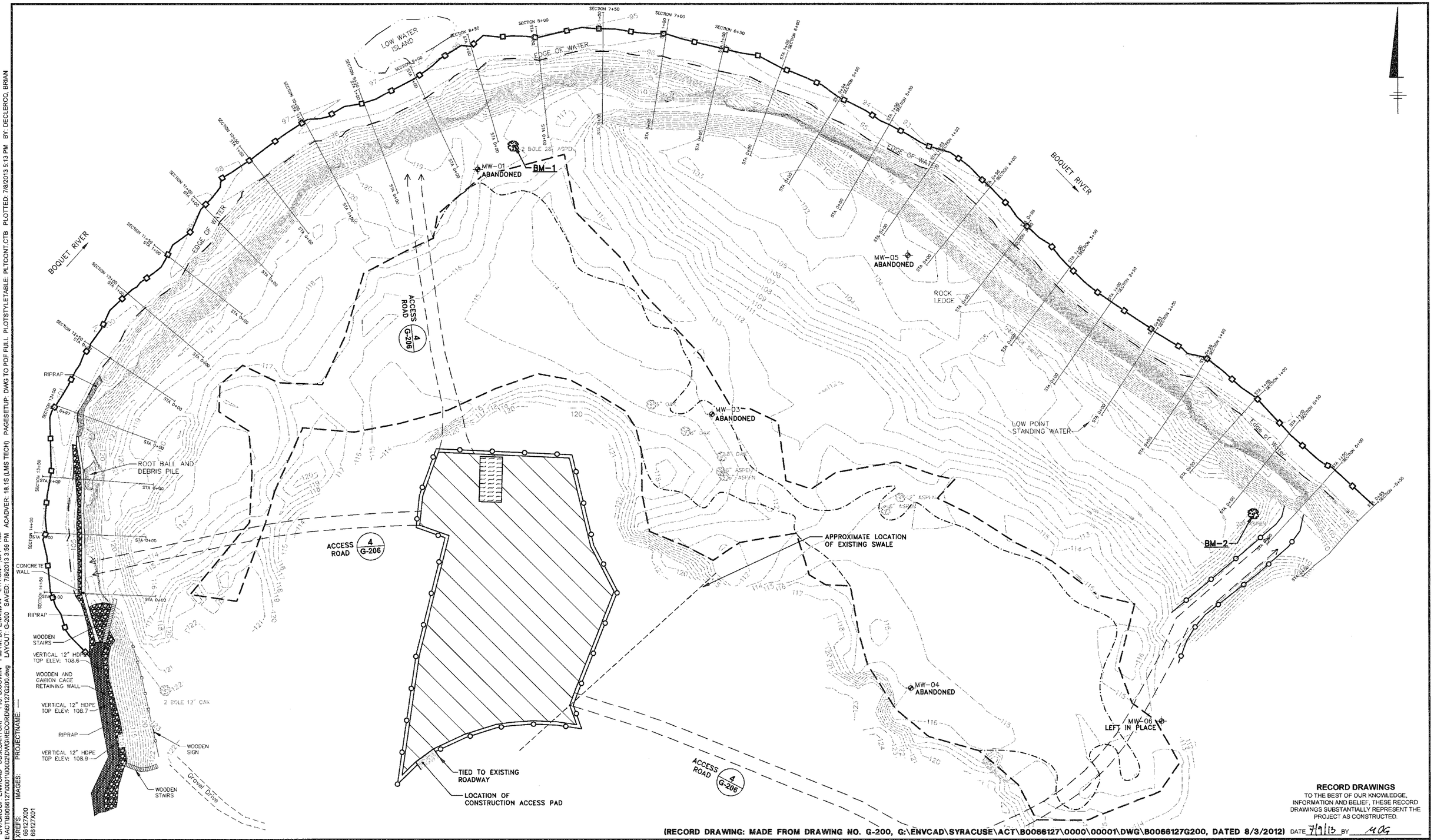
GENERAL

ARCADIS Project No. B0066127.0001.00002

Date JULY 2013

ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
TEL. 315.446.9120

G-102



RECORD DRAWINGS
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(RECORD DRAWING: MADE FROM DRAWING NO. G-200, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G200, DATED 8/3/2012) DATE 7/9/13 BY MOG

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 7/9/13 | Project Mgr.: LSK
Designed by: LJP | Drawn by: BKD | Checked by: LSK

STATE OF NEW YORK · MARK OWEN GRAVELDING · 069985 · LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK
WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT

SITE DEVELOPMENT PLAN

GENERAL

ARCADIS Project No.: B0066127.0001.00002
Date: JULY 2013
ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
TEL. 315.446.9120

G-200

ADDRESS EXPOSED ASH WITH TOPSOIL SEED, EROSION CONTROLS

MONITOR EXPOSED ASH AREA FOR NATURAL VEGETATION GROWTH

WETLAND DELINEATION AREA NO. 4

UNDISTURBED SECTION STONE (RIP RAP TOE OF SLOPE AS SHOWN ON RESTORATION PLAN)

5 / G-208

LOW WATER ISLAND

EDGE OF WATER

BOQUET RIVER

BM-1

ACCESS ROAD 4 / G-206

WETLAND DELINEATION AREA NO. 2

ROCK LEDGE

LOW POINT STANDING WATER

WETLAND DELINEATION AREA NO. 1

BM-2

MW-06

LOCATION OF INLET/OUTFALL STRUCTURE

2 / G-208

RIVER BANK RESHAPING

WETLAND DELINEATION AREA NO. 3

CONCRETE WALL

RESHAPE STEEP SLOPES/REINFORCE RIPRAP AS NEEDED

WOODEN STAIRS

EXISTING WOODEN AND GABION CAGE RETAINING WALL

2 DOLE 12" OAK

Gravel Drive

TIED TO EXISTING ROADWAY

LOCATION OF CONSTRUCTION ACCESS PAD

LEGEND:

RIVERBANK STABILIZATION AREA

TREED AREA TO REMAIN UNDISTURBED

XREFS: B0066127X00 B0066127X01
IMAGES: PROJECTNAME: ---

RECORD DRAWINGS
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(RECORD DRAWING: MADE FROM DRAWING NO. G-201, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G201, DATED 8/3/2012) DATE 7/9/13 BY MOG

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State: NY	Date Signed: 7/9/13	Project Mgr.: LSK
Designed by: LJP	Drawn by: BKD	Checked by: LSK

STATE OF NEW YORK · MARK OWEN GRAVELDING · 059985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK
WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT

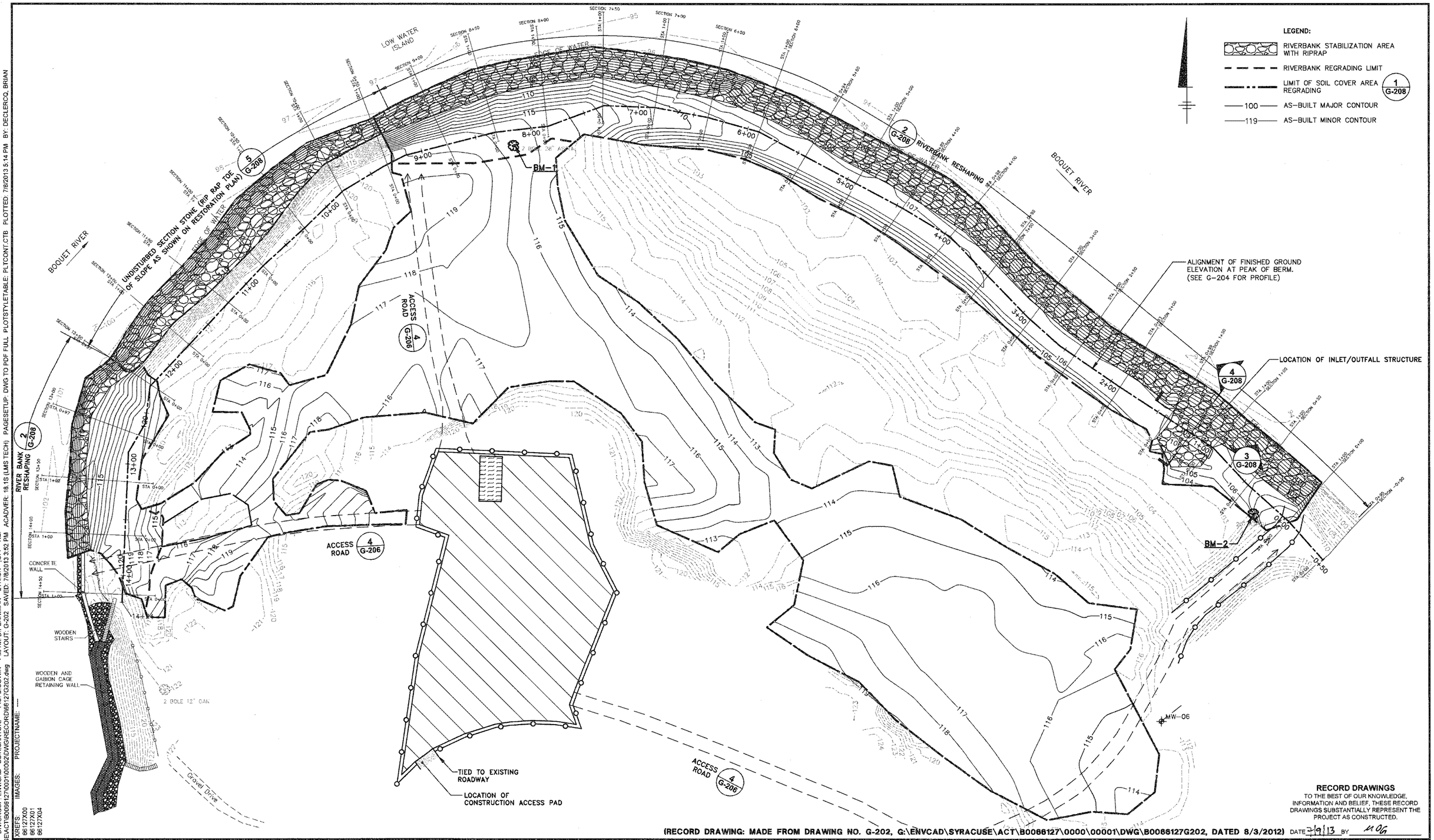
EXCAVATION PLAN

GENERAL

ARCADIS Project No.: B0066127.0001.00002
Date: JULY 2013

ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
TEL. 315.446.9120

G-201



CITY: SYRACUSE, NY DIVGROUP: ENVICAD DB: K.SARTORI PIC: D.COWIN PM: TM D.PENNIMAN LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0066127\0001\00002\DWG\REC\RD\B0066127G202.dwg LAYOUT: G-202 SAVED: 7/8/2013 3:52 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: DWG TO PDF FULL PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 7/8/2013 5:14 PM BY: DECLERCQ, BRIAN

XREFS:
B0066127X00
B0066127X01
B0066127X04
IMAGES:
PROJECTNAME: ---

RECORD DRAWINGS
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(RECORD DRAWING: MADE FROM DRAWING NO. G-202, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G202, DATED 8/3/2012) DATE 7/9/13 BY MOG

1"=40' (40' 0 40' 80')

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Professional Engineer's Name: MARK O. GRAVELDING			
Professional Engineer's No.: 069985-1			
State: NY	Date Signed: 7/9/13	Project Mgr.: LSK	
Designed by: LJP	Drawn by: BKD	Checked by: LSK	

STATE OF NEW YORK MARK OWEN GRAVELDING LICENSED PROFESSIONAL ENGINEER NO. 069985-1

ARCADIS
ARCADIS OF NEW YORK, INC.

GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK
WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT

FINAL GRADING PLAN

GENERAL

ARCADIS Project No.: B0066127.0001.00002
Date: JULY 2013

ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
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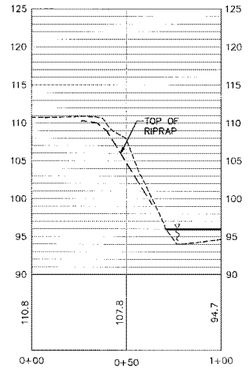
G-202



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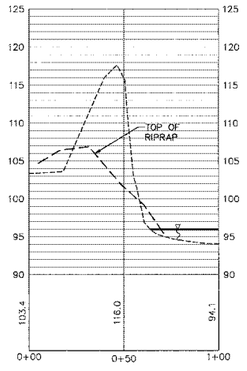

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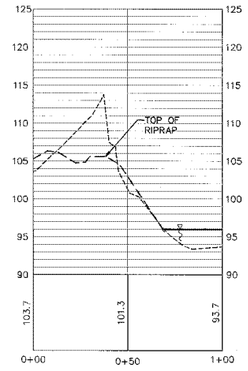

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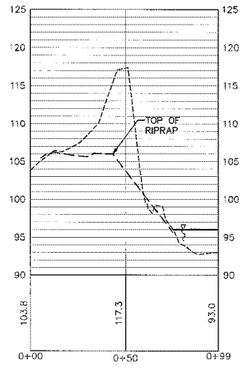
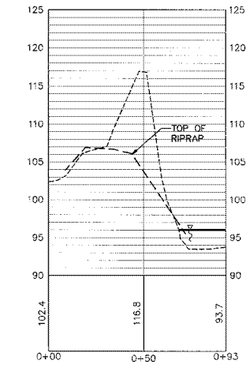


SECTION 1+50



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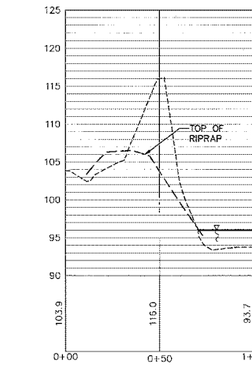

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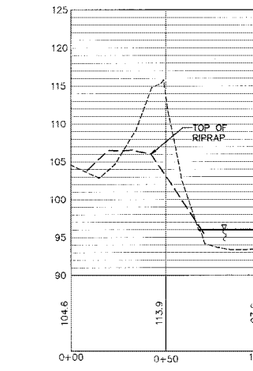

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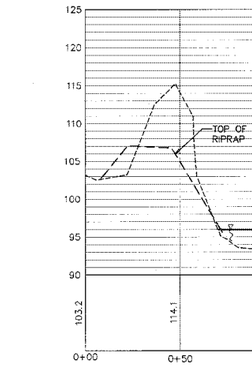

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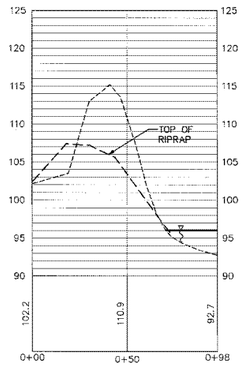

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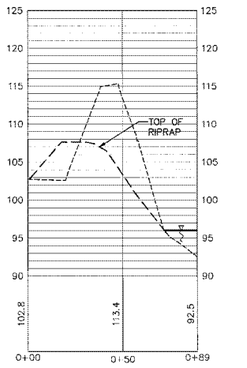

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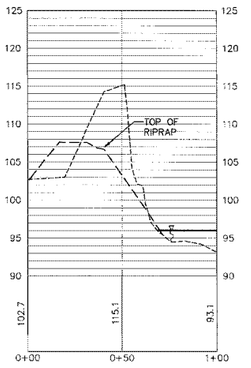

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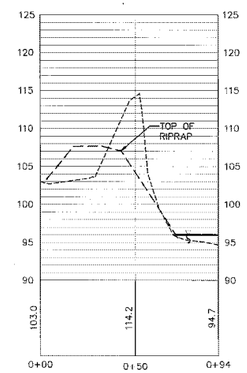

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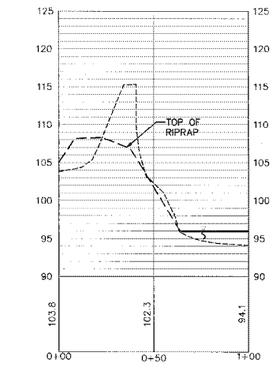

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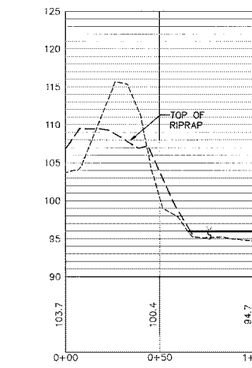

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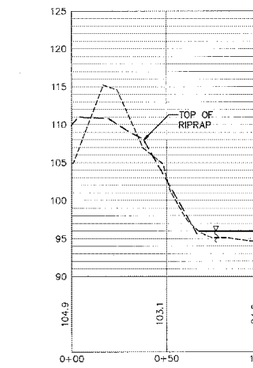

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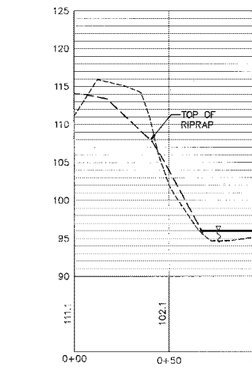

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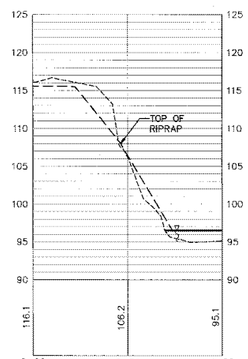

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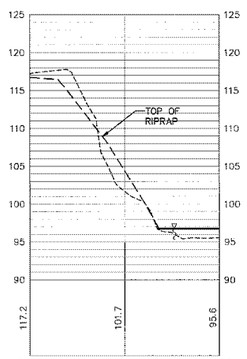

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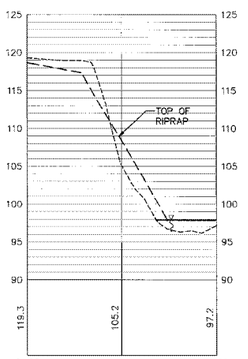
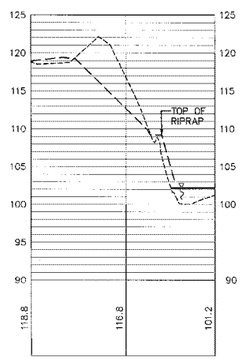


SECTION 9+00

SEE DRAWING G-203 B FOR CROSS SECTIONS 9+50 TO 12+50



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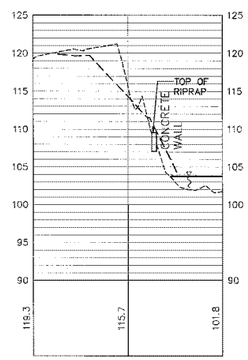

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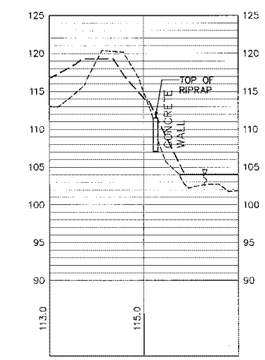

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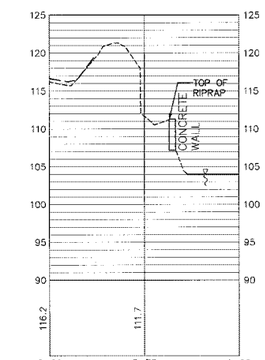

SECTION 14+50

LEGEND:

- AS-BUILT GRADE
- PRE-CONSTRUCTION GRADE
- WATER SURFACE (AS MEASURED 11/22/11)

NOTE:

1. SECTIONS PRESENTED HEREIN REPRESENT PORTIONS OF THE RIVER BANK IN THE SECTION TO BE RESHAPED.
2. NOTE THAT WATER ELEVATION DECREASES FROM UPSTREAM TO DOWNSTREAM TO REFLECT THE CHANGE IN BED ELEVATION MOVING IN THE DOWNSTREAM DIRECTION.
3. PLEASE NOTE VERTICAL SCALE IS SHOWN AT A 4x EXAGGERATION.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

(RECORD DRAWING: MADE FROM DRAWING NO. G-203A, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G203A, DATED 8/3/2012) DATE 7/9/13 BY MOG

CITY: SYRACUSE, NY DIV/GROUP: ENV/CAD DB:K.SARTORI PIC: D.COWIN PM/TM: D.PENNIMAN LYR:ON=*;OFF=*REF*
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XREFS: IMAGES: PROJECTNAME: ---
B0066127X00

40' 0 40' 80' HORIZONTAL SCALE 1"=40'
10' 0 10' 20' VERTICAL SCALE 1"=10'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	7/9/13	LSK
Designed by: LJP	Drawn by: BKD	Checked by: LSK

STATE OF NEW YORK MARK OWEN GRAVELDING NO. 069985 LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

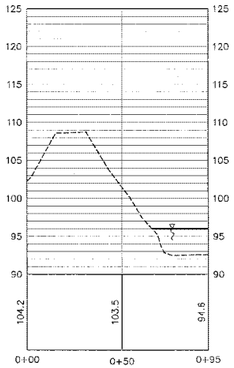
GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK
WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT

CROSS SECTIONS - RESHAPED CONDITIONS STATIONS 0+00 TO 9+00 AND 13+00 TO 14+50

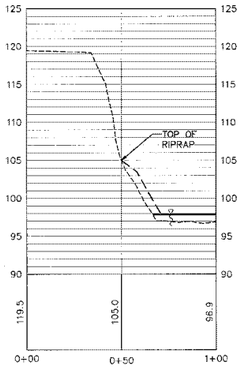
GENERAL

ARCADIS Project No.: B0066127.0001.00002
Date: JULY 2013
ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
TEL. 315.446.9120

G-203 A



SECTION -0+50
(OUTSIDE PROJECT WORK LIMITS)



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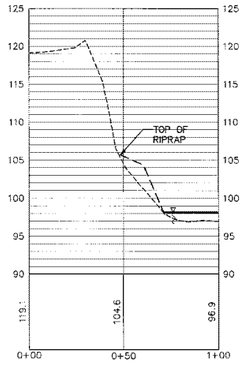
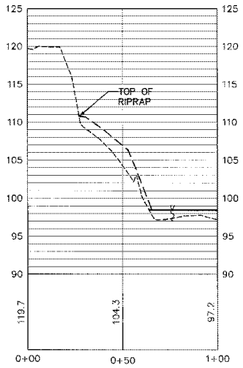
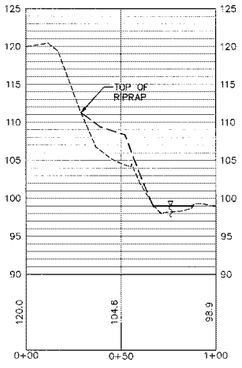


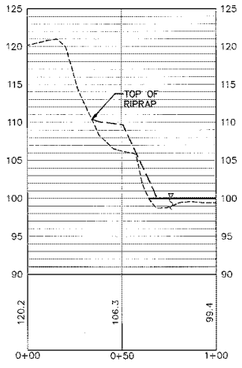
SECTION 10+00



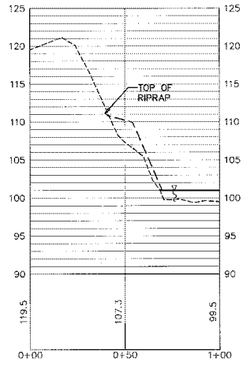
SECTION 10+50



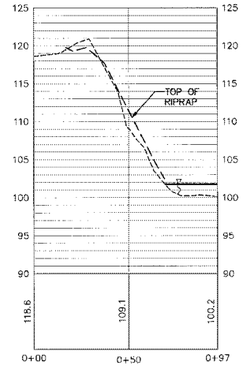
SECTION 11+00



SECTION 11+50



SECTION 12+00



SECTION 12+50

LEGEND:

- AS-BUILT GRADE
- PRE-CONSTRUCTION GRADE
- WATER SURFACE (AS MEASURED 11/22/11)

NOTE:

1. SECTIONS PRESENTED HEREIN REPRESENT PORTIONS OF THE RIVER BANK IN THE UNDISTURBED SECTION.
2. NOTE THAT WATER ELEVATION DECREASES FROM UPSTREAM TO DOWNSTREAM TO REFLECT THE CHANGE IN BED ELEVATION MOVING IN THE DOWNSTREAM DIRECTION.
3. PLEASE NOTE VERTICAL SCALE IS SHOWN AT A 4x EXAGGERATION.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

(RECORD DRAWING: MADE FROM DRAWING NO. G-203B, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G203B, DATED 8/3/2012) DATE 7/9/13 BY MOG

CITY: SYRACUSE, NY DIV/GROUP: ENV/CAD DB: K.SARTORI PIC: D.COWIN PM/TM: D.PENNIMAN LYR:ON=*;OFF=*REF*
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XREFS: IMAGES: PROJECTNAME: ---
B0066127X00

40' 0 40' 80'
HORIZONTAL SCALE 1"=40'
10' 0 10' 20'
VERTICAL SCALE 1"=10'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	7/9/13	LSK
Designed by	Drawn by	Checked by
LJP	BKD	LSK

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK
WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT

CROSS SECTIONS - RESHAPED CONDITIONS STATIONS -0+50 AND 9+50 TO 12+50

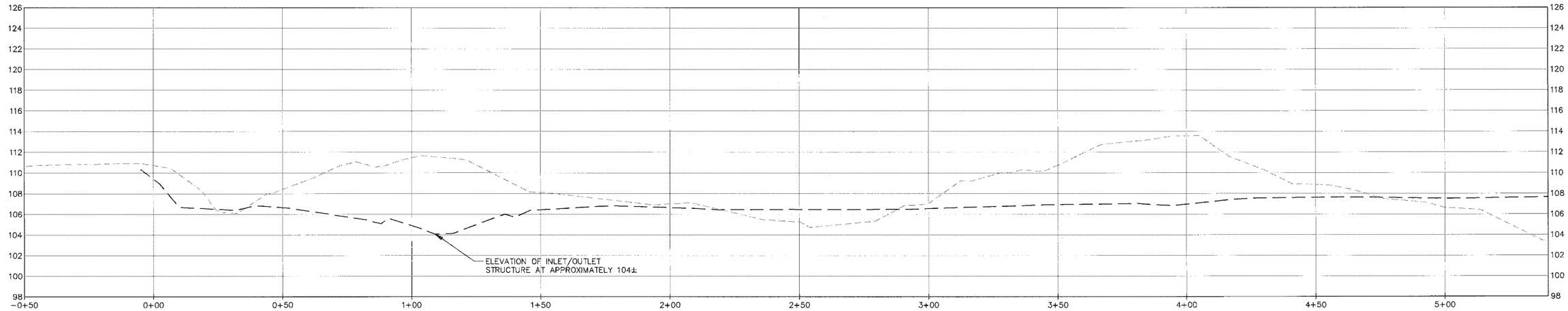
GENERAL

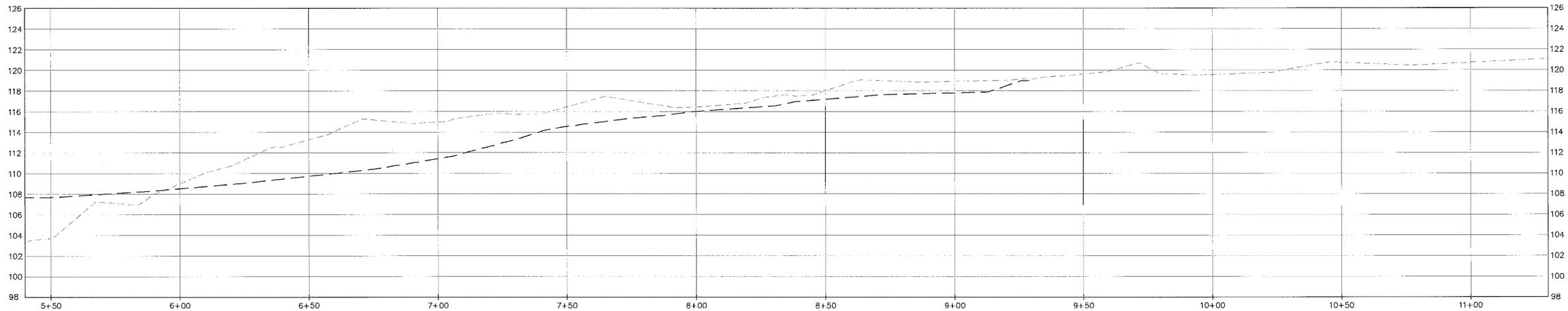
ARCADIS Project No.
B0066127.0001.00002

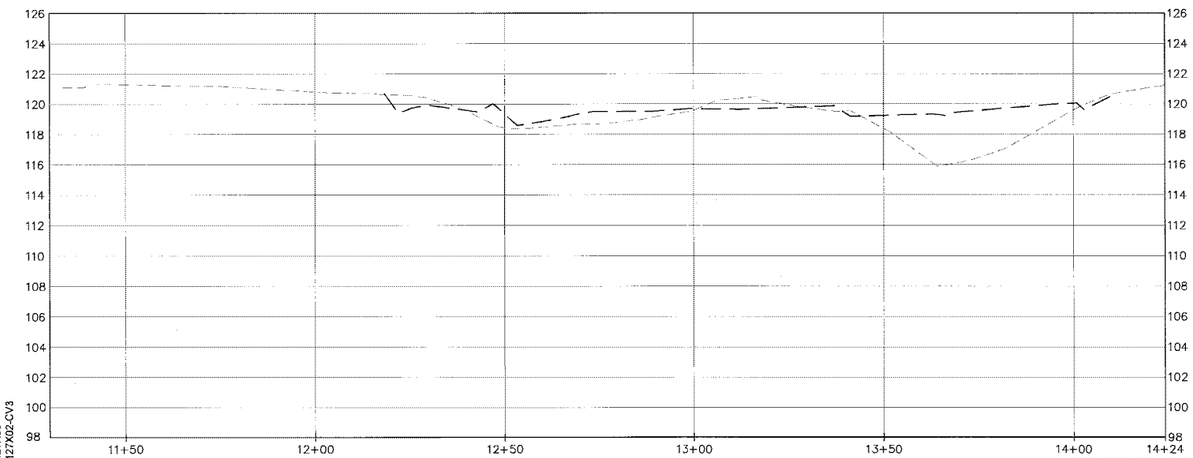
Date
JULY 2013

ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
TEL. 315.446.9120

G-203 B







LEGEND:

PRE-CONSTRUCTION GRADE ELEVATION AT PEAK OF PROPOSED BERM

AS-BUILT GROUND ELEVATION AT PEAK OF BERM

NOTE:

1. PROFILE FOR "EXISTING GROUND ELEVATION" REPRESENTS THE PRE-CONSTRCTION ELEVATION AT THE CENTERLINE OF THE CONSTRUCTED BERM.
2. PLEASE NOTE VERTICAL SCALE IS SHOWN AT A 4x EXAGGERATION.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

(RECORD DRAWING: MADE FROM DRAWING NO. G-204, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G204, DATED 8/3/2012) DATE 7/9/13 BY MOG

HORIZONTAL SCALE 1"=20'

VERTICAL SCALE 1"=5'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	7/9/13	LSK
Designed by	Drawn by	Checked by
LJP	BKD	LSK

STATE OF NEW YORK MARK OWEN GRAVELDING 069985-1 LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK
WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT

PROFILE - PRE-CONSTRUCTION AND RESHAPED CONDITIONS

GENERAL

ARCADIS Project No.
B0066127.0001.00002

Date
JULY 2013

ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
TEL. 315.446.9120

G-204

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB:K.SARTORI PIC: D.COWIN PM:TM D.PENNIMAN LYR:ON=*;OFF=*REF*
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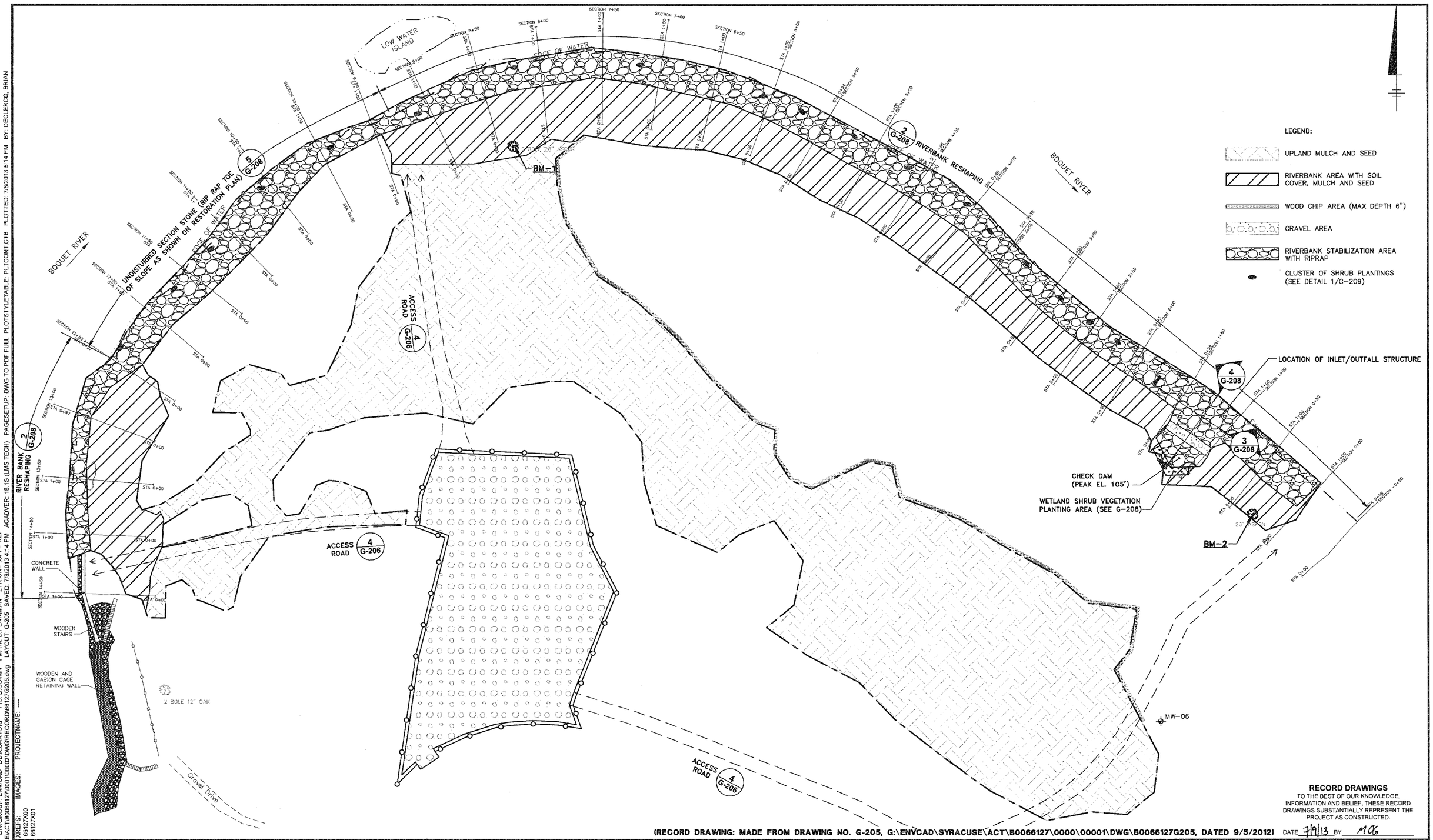
PROJECTNAME: ---



RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.
DATE 7/9/13 BY MOG

(RECORD DRAWING: MADE FROM DRAWING NO. G-205, G:\ENVCAD\SYRACUSE\ACT\B0066127\0000\00001\DWG\B0066127G205, DATED 9/5/2012)

1"=40' 40' 0 40' 80'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	7/9/13	LSK
Designed by	Drawn by	Checked by
LJP	BKD	LSK

STATE OF NEW YORK MARK O. GRAVELDING NO. 069985 LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

GEORGIA-PACIFIC LLC • WILLSBORO, NEW YORK
WILLSBORO BLACK ASH POND
FINAL ENGINEERING REPORT

RESTORATION PLAN

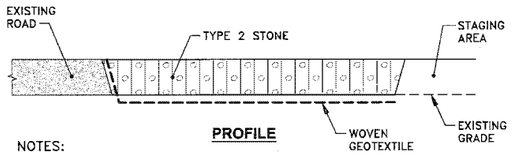
GENERAL

ARCADIS Project No.
B0066127.0001.00002

Date
JULY 2013

ARCADIS OF NEW YORK
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NEW YORK
TEL. 315.446.9120

G-205

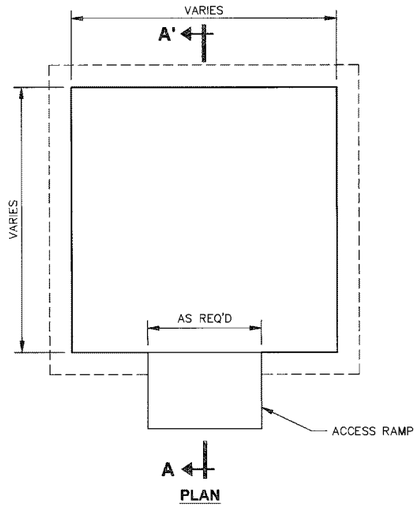


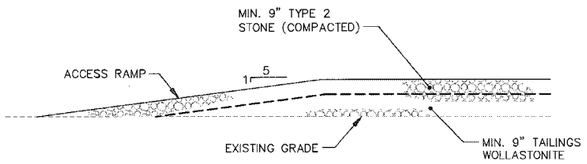
NOTES:

1. ACCESS PAD WILL BE A LEAST 15' WIDE AND 6" THICK.
2. INSTALL ACCESS PAD AT ALL ACCESS POINTS TO PAVED PUBLIC ROADS.

TYPICAL CONSTRUCTION ACCESS PAD (1)

NOT TO SCALE



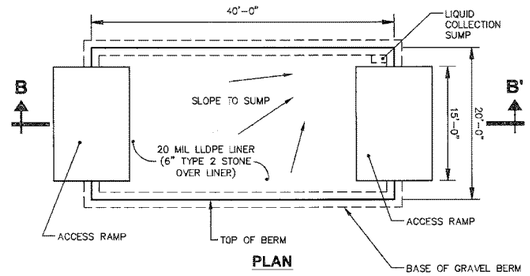


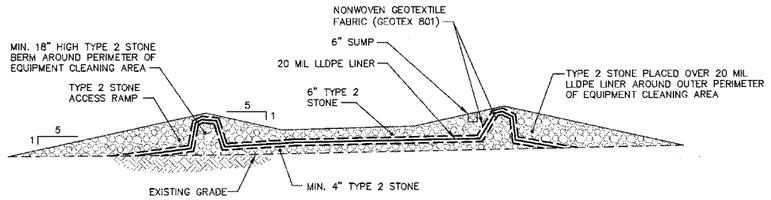
NOTES:

1. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, THE TEMPORARY STAGING AREA, INCLUDING GEOSYNTHETICS, SHALL BE REMOVED BY THE CONTRACTOR FOR OFF-SITE DISPOSAL AT AN OWNER APPROVED FACILITY.
2. COMPACTION OF GRANULAR FILL MATERIAL SHALL BE OF SUFFICIENT DENSITY TO PROVIDE A FIRM AND UNIFORM SURFACE.

TYPICAL TEMPORARY STAGING AREA (2)

NOT TO SCALE



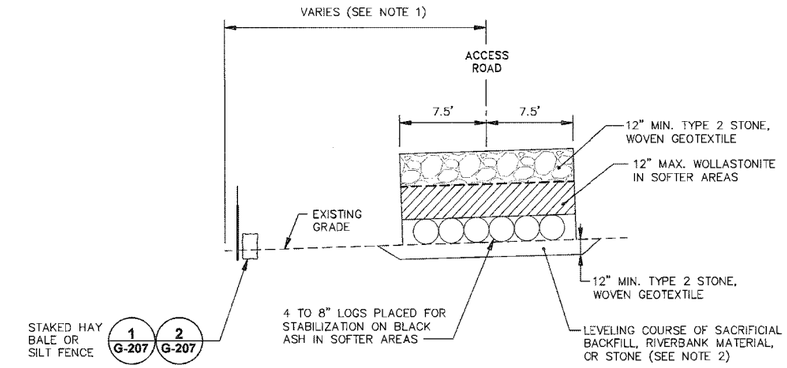


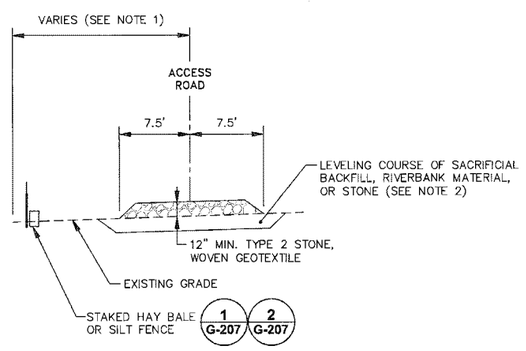
NOTES:

1. EQUIPMENT CLEANING AREA WILL HAVE A GENERAL SLOPE TOWARD A COLLECTION SUMP TO FACILITATE THE COLLECTION OF WASH FLUIDS, IF ANY.
2. SOLIDS AND LIQUIDS, IF ANY, ACCUMULATED IN THE EQUIPMENT CLEANING AREA WILL BE COLLECTED AND PLACED IN THE SOIL COVER AREA.
3. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, THE EQUIPMENT CLEANING AREA, INCLUDING LLDPE LINER, IS TO BE REMOVED BY THE CONTRACTOR FOR DISPOSAL.
4. THE CONTRACTOR WILL TAKE PRECAUTIONS TO CONTAIN SPRAYED FLUIDS, IF ANY, WITHIN THE EQUIPMENT CLEANING AREA.

TYPICAL EQUIPMENT CLEANING AREA (3)

NOT TO SCALE





NOTES:

1. DIMENSION VARIES TO ACCOMMODATE EXISTING FEATURES AND TOPOGRAPHY.
2. PLACEMENT OF LEVELING COURSE MATERIALS AND ACCESS ROADS SHALL BE AS REQUIRED TO SUPPORT CONSTRUCTION EQUIPMENT.

TYPICAL ACCESS ROADS (4)

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No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MARK O. GRAVELDING		
Professional Engineer's No.		
069985-1		
State	Date Signed	Project Mgr.
NY	7/9/13	LSK
Designed by	Drawn by	Checked by
LJP	BKD	LSK

STATE OF NEW YORK MARK OWEN GRAVELDING NO. 069985-1 LICENSED PROFESSIONAL ENGINEER

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MISCELLANEOUS DETAILS

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ARCADIS Project No.	B0066127.0001.00002
Date	JULY 2013

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6723 TOWPATH ROAD
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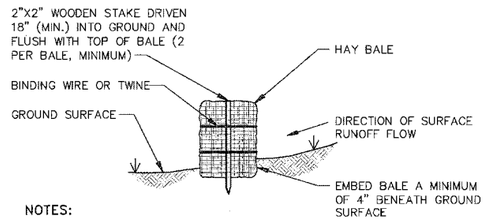
SYRACUSE, NEW YORK
TEL: 315.446.9120

G-206

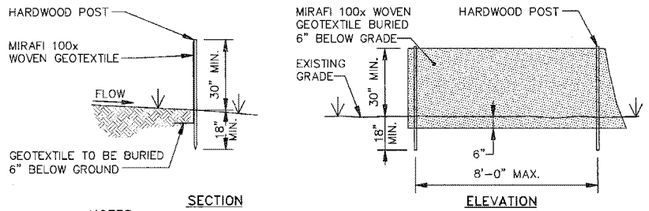


NOTES:

1. HAY BALES WILL ONLY BE USED AS REQUIRED.
2. BALES WILL BE PLACED TIGHTLY TOGETHER, END TO END, TO FORM A CONTINUOUS BARRIER IN SELECTED AREAS.
3. THE INTEGRITY OF THE HAY BALES WILL BE MAINTAINED FOR THE PROJECT DURATION AND UNTIL ADEQUATE VEGETATIVE GROWTH IS ESTABLISHED.
4. STOCKPILE ANY EXCAVATED MATERIAL ONSITE FOR USE AS BACKFILL UPON COMPLETION.

STAKED HAY BALE (1)

NOT TO SCALE

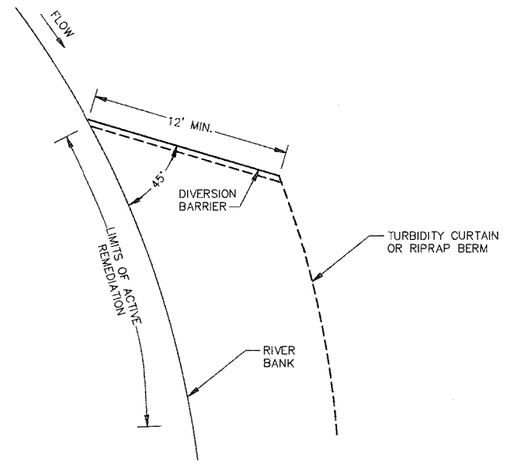


NOTES:

1. ACCUMULATIONS OF SEDIMENT ADJACENT TO SILT FENCES WILL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF OF THE HEIGHT OF SILT FENCE THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES.
2. THE INTEGRITY OF SILT FENCING WILL BE MAINTAINED FOR THE PROJECT DURATION AND UNTIL ADEQUATE VEGETATIVE GROWTH IS ESTABLISHED.

SILT FENCE (2)

NOT TO SCALE



NOTES:

1. DIVERSION BARRIERS (E.G., JERSEY BARRIERS) WILL BE PLACED UPSTREAM OF THE LIMITS OF ACTIVE REMEDIATION TO CALM THE WATERS WITHIN THE WORK AREA. DIVERSION BARRIERS MUST BE A MINIMUM OF 3' HIGH. IN AREAS OF UNEVEN SURFACE, SAND BAGS MAY BE PLACED UNDER THE DIVERSION BARRIER(S) AS NEEDED TO STABILIZE SUCH STRUCTURES.
2. TURBIDITY CURTAINS OR RIPRAP BERM WILL BE USED TO PROVIDE ADDITIONAL TURBIDITY CONTROL IN THE EVENT THAT THE WATER STILLING TECHNIQUES ARE NOT FOUND TO SUFFICIENTLY CONTROL THE EFFECTS OF CONSTRUCTION ON THE TURBIDITY LEVELS IN THE BOQUET RIVER. THE TURBIDITY CURTAINS WILL CONSIST OF GEOTEXTILE FABRIC SUSPENDED FROM BUOYS, WHICH WILL BE CONNECTED TO THE DIVERSION BARRIER AND INSTALLED PARALLEL TO THE PORTIONS OF THE RIVERBANK WHERE CONSTRUCTION IS BEING PERFORMED, AND MAY BE ANCHORED TO SHORE OR THE RIVER BOTTOM.
3. THE CONTRACTOR SHALL USE APPROPRIATE OPERATIONAL CONTROL (I.E., LIMITING THE FALL HEIGHT OF THE BUCKET, SLOW CYCLE TIMES) TO REDUCE THE POTENTIAL EFFECTS OF CONSTRUCTION ON TURBIDITY IN THE BOUQUET RIVER.
4. THE LIMITS OF ACTIVE REMEDIATION WORK IN SHALL BE IN SHORT SECTIONS NO MORE THAN 100 FEET DOWNSTREAM OF THE DEFLECTION WALL SO AS TO STAY WITHIN THE AREA WITH THE LEAST HYDRAULIC FORCES.
5. THE CONTRACTOR MAY ALSO INSTALL SILT FENCING MAY ALSO BE PLACED JUST BELOW THE TOE OF SLOPE, AS NECESSARY, TO REDUCE THE EFFECTS OF CONSTRUCTION ON THE TURBIDITY LEVELS IN THE BOUQUET RIVER.

TEMPORARY TURBIDITY CONTROL SYSTEM (3)

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Professional Engineer's Name		
MARK O. GRAVELDING		
Professional Engineer's No.		
069985-1		
State	Date Signed	Project Mgr.
NY	7/9/13	LSK
Designed by	Drawn by	Checked by
LJP	BKD	LSK

STATE OF NEW YORK MARK OWEN GRAVELDING LICENSED PROFESSIONAL ENGINEER NO. 069985-1

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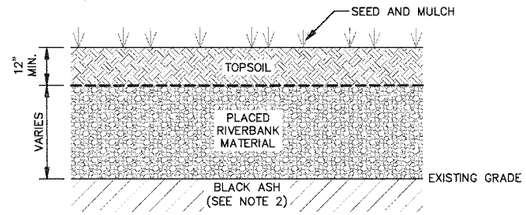
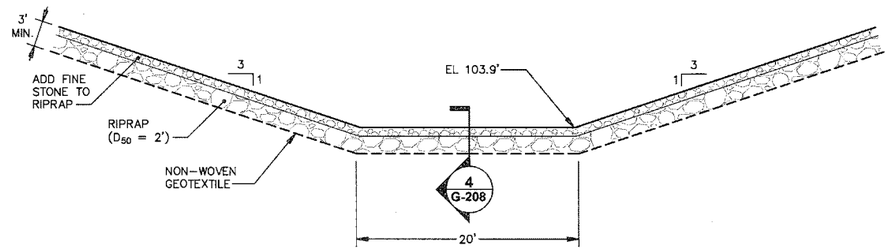


NOTES:

1. COVER SHALL BE GRADED SO AS TO DRAIN AND AVOID PONDING.
2. COMPACT SURFACE OF BLACK ASH PRIOR TO PLACEMENT OF RIVERBANK MATERIAL. REFER TO SPECIFICATION SECTIONS 02203 AND 02201 FOR COMPACTION REQUIREMENTS OF BLACK ASH SUBGRADE AND RIVERBANK MATERIALS.

TYPICAL COVER/RESTORATION DETAIL 1

NOT TO SCALE



TYPICAL INLET/OUTLET STRUCTURE 3

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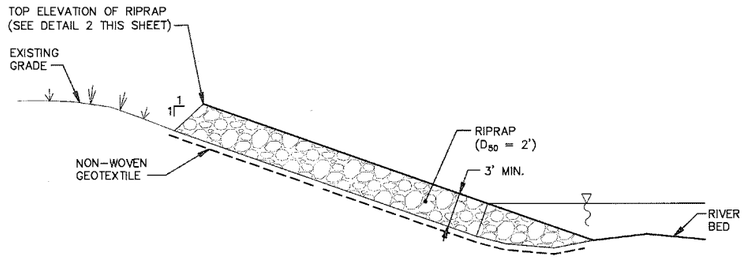

NOTE:

1. CONTRACTOR SHALL CLEAR VEGETATION (NO GRUBBING) FROM PORTION OF RIVERBANK TO RECEIVE RIPRAP.
2. ADDRESS EXPOSED ASH ABOVE TOP ELEVATION OF RIPRAP NOTED, AS NECESSARY WITH SIMILAR GEOTEXTILE AND RIPRAP PLACEMENT, OR AS DIRECTED BY THE ENGINEER.

TYPICAL RIPRAP PLACEMENT FOR UNDISTURBED SECTION 5

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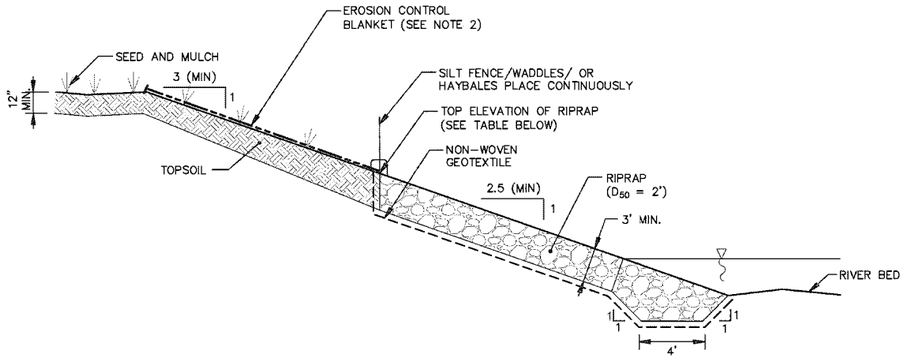

TOP ELEVATION OF RIPRAP (FT)	TRANSECT RANGE
105 – 107	0+00 TO 4+00
106 – 107	4+50 TO 6+00
107 – 108	6+50 TO 8+00
105 – 114	8+50 TO 14+00

NOTE:

1. THE CONTRACTOR SHALL GRADUALLY TAPER THE TOP ELEVATION OF THE RIPRAP BETWEEN TRANSECT RANGES (IE. GRADUALLY INCREASE THE TOP ELEVATION FROM 107 FT TO 108 FT BETWEEN TRANSECT 6+00 AND 6+50).
2. PLACE EROSION CONTROL BLANKET (ECB) ON TOPSOIL SLOPE 3:1 (H:V) OR GREATER. ECB SHALL BE NAG SC150 OR APPROVED EQUAL INSTALLED PER MANUFACTURERS SPECIFICATION.

TYPICAL RESHAPED RIVERBANK 2

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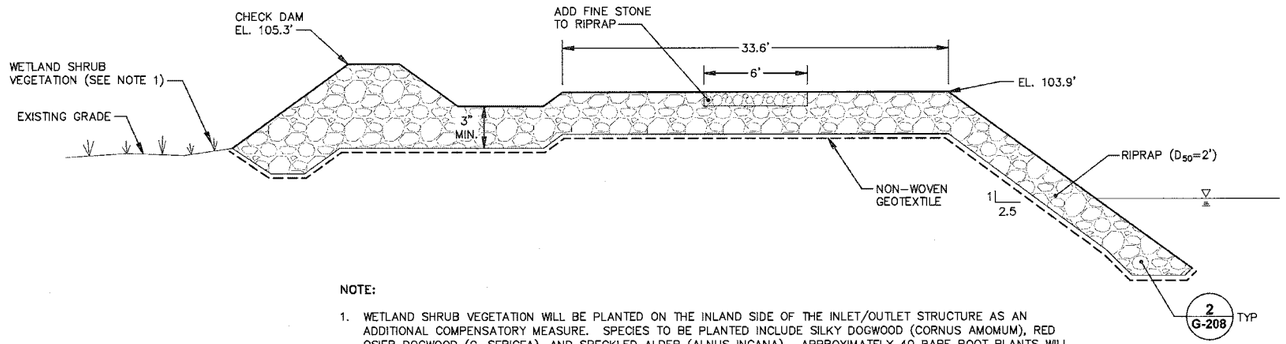

NOTE:

1. WETLAND SHRUB VEGETATION WILL BE PLANTED ON THE INLAND SIDE OF THE INLET/OUTLET STRUCTURE AS AN ADDITIONAL COMPENSATORY MEASURE. SPECIES TO BE PLANTED INCLUDE SILKY DOGWOOD (CORNUS AMOMUM), RED OSIER DOGWOOD (C. SERICEA), AND SPECKLED ALDER (ALNUS INCANA). APPROXIMATELY 40 BARE ROOT PLANTS WILL BE INSTALLED AT A RATE OF 2-FOOT ON-CENTER OVER A 300 SQUARE-FOOT AREA IMMEDIATELY ADJACENT TO THE PROPOSED CHECK DAM. PRIOR TO PLANTING, EXISTING MATERIAL WILL BE EXCAVATED (AND TRANSPORTED TO THE SOIL COVER AREA) AND THE PLANTING AREA WILL BE COVERED WITH TOPSOIL AT A MINIMUM DEPTH OF 12 INCHES, MAINTAINING THE EXISTING CONTOUR ELEVATIONS.

TYPICAL INLET/OUTLET STRUCTURE CROSS SECTION 4

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	7/9/13	LSK
Designed by	Drawn by	Checked by
LJP	BKD	LSK

STATE OF NEW YORK · KERRY OWEN GRAVELDING · LICENSED PROFESSIONAL ENGINEER · NO. 069985

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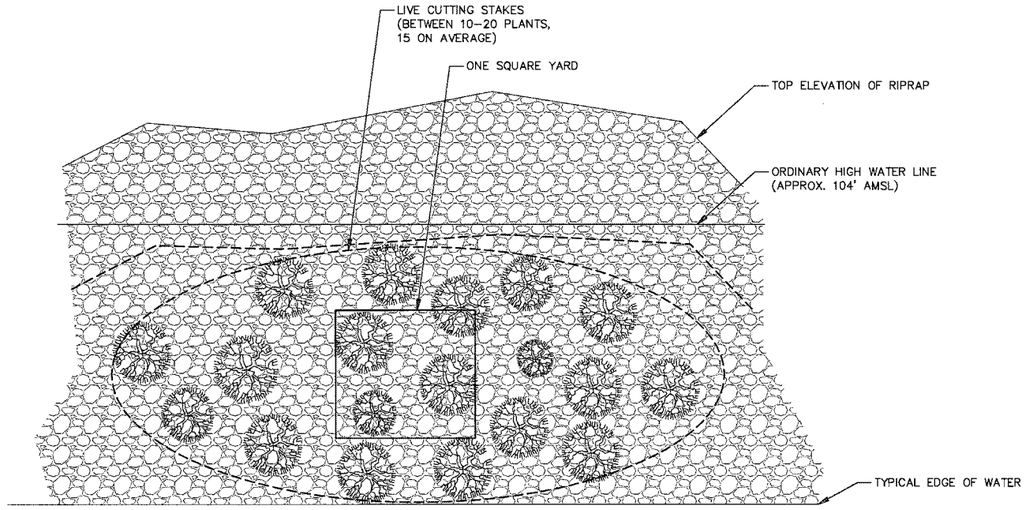

SHRUB CLUSTER PLANTING DETAIL (1)

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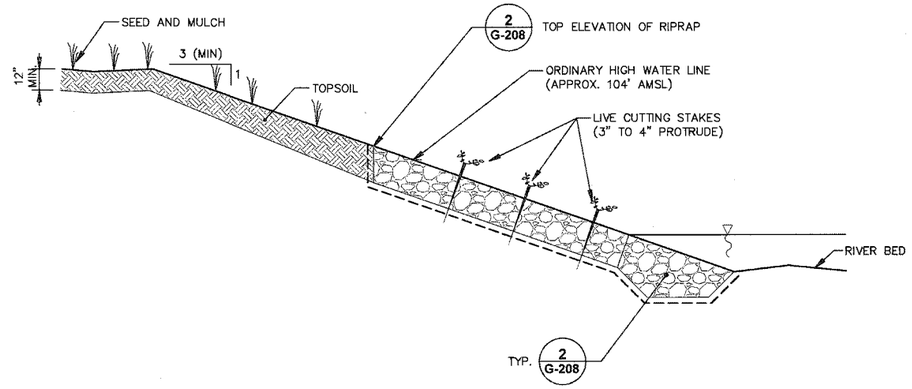

TYPICAL RESHAPED RIVERBANK PLANTING DETAIL (2)

NOT TO SCALE

NOTES:

1. SHRUB PLANTINGS SHALL BE INSTALLED ALONG THE RIVERBANK IN ACCORDANCE WITH THE FOLLOWING PLANTING SCHEDULE:

COMMON NAME	SCIENTIFIC NAME	NURSERY STOCK TYPE	POSITION ALONG RIVERBANK	APPROXIMATE SPACING
Sanbar Willow	Salix exigua	Live Stakes (44"–60")	Between Ordinary High Water mark (approx. 104' AMSL) and normal edge of water	18 randomly positioned cluster planting; 10 to 20 plants per cluster

2. SHRUBS SHALL BE PLANTED AS PER SUPPLIER'S SPECIFICATIONS IN A POSITION PERPENDICULAR TO THE SLOPE WITHOUT ANY EXPOSED ROOTS.

3. CLUSTER PLANTING LOCATIONS SHALL BE RANDOMLY PLACED AND SHALL NOT BE ESTABLISHED IN ORGANIZED ROWS. LIVE STAKE WILLOW PLANTING DENSITY WITHIN CLUSTERS SHALL RANGE BETWEEN 2 TO 4 STAKES PER SQUARE YARD.

4. LIVE CUT WILLOW STAKES SHALL BE APPROXIMATELY 1 TO 1.5 INCHES IN DIAMETER AND LONG ENOUGH TO REACH THROUGH ARMOR AND FILTER LAYERS INTO THE SOIL AT THE BASE OF THE RIPRAP. THE STAKES SHALL BE IN CONTACT WITH A MINIMUM OF APPROXIMATELY 6"OF SOIL BELOW ROCK RIPRAP SURFACE LEVEL, TO THE EXTENT PRACTICABLE.

5. LIVE STAKE PLANTINGS SHALL REMAIN MOIST UNTIL INSTALLATION. PLANTINGS SHALL NOT BE INSTALLED IN STANDING WATER. SATURATED SOILS ARE DESIRED FOR THE PLANTINGS.

6. LIVE STAKES SHALL BE INSERTED INTO THE OPENINGS OR CRACKS BETWEEN THE ROCKS. IT MAY BE HELPFUL TO USE A BAR OR ROD TO CREATE A HOLE TO INSERT THE CUTTINGS DOWN INTO THE SOIL THROUGH THE UNDERLYING FABRIC.

7. LIVE WILLOW STAKES SHALL BE PLANTED SO THAT AT LEAST 3 TO 4 INCHES OF STAKE IS PROTRUDING ABOVE THE RIPRAP SURFACE. CARE SHOULD BE TAKEN TO ENSURE THAT STAKES ARE INSTALLED IN THE CORRECT DIRECTION AND THAT THEY ARE NOT DAMAGED OR SPLIT DURING INSTALLATION. DAMAGED ENDS SHALL BE TRIMMED OFF AFTER INSTALLATION.

RECORD DRAWINGS
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DATE 7/9/13 BY M.G.

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No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING			
Professional Engineer's No.: 069985-1			
State: NY	Date Signed: 7/9/13	Project Mgr: LSK	
Designed by: LJP	Drawn by: BKD	Checked by: LSK	

STATE OF NEW YORK · MARK OWEN GRAVELDING · 069985-1 · LICENSED PROFESSIONAL ENGINEER

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Appendix C

Excavation Work Plan

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Georgia-Pacific LLC

Appendix C –
Excavation Work Plan

Willsboro Black Ash Pond Site
Willsboro, Essex County, New York

NYSDEC Site #: 516009

December 2014

ARCADIS

Table of Contents

Acronym	Definition
AOC	Order on Consent and Administrative Settlement
CFR	Code of Federal Regulations
EWP	Excavation Work Plan
HASP	Health and Safety Plan
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
RAWP	Remedial Action Work Plan
SMP	Site Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TAL	Target Analyte List
TCL	Target Compound List

1. Introduction

This Excavation Work Plan (EWP), prepared in support of the Site Management Plan (SMP), establishes procedures to follow in the event that soil excavation or other intrusive activities are required for specific areas at the Willsboro Black Ash Pond Site (Site) in Willsboro, New York. As discussed in the SMP, on August 23, 2011, Georgia-Pacific LLC (Georgia-Pacific) entered into an Order on Consent and Administrative Settlement (AOC) Index No. A5-0771-07-11 (NYSDEC 2011) with the New York State Department of Environmental Conservation (NYSDEC) to remediate the Site. The Site was remediated in accordance with the Final Remedial Action Work Plan (RAWP) (August 2012), and was completed in May, 2013.

As described in the SMP, after completion of the remedial work, subsurface black ash material remains at the Site. This black ash material is hereafter referred to as "remaining black ash material."

Note that simple excavations may only require compliance with a portion of the EWP. For example, excavation of a small volume of soil from above the water table that is directly loaded for off-site disposal may not require implementation of the stockpiling or fluids management provisions of this template.

2. Notification

At least 15 days prior to the start of any activity anticipated to encounter remaining black ash material, the Site's owner or representative will notify the NYSDEC. Currently, this notification will be made to the NYSDEC Project Manager:

Mr. John Swartwout, P.E.
New York Department of Environmental Conservation
625 Broadway, 11th Floor
Albany, NY 12233-7015
john.swartwout

As discussed in the SMP, the Site's owner is the Town of Willsboro (Town). However, Georgia-Pacific will be responsible for implementing the SMP for 4 years post-construction. As such, during the first 4 years, Georgia-Pacific may assist the Town with notifications or other requirements included in this EWP.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for Site regrading, intrusive elements or utilities to be installed below the surface, estimated volumes of material to be excavated, and any work that may impact an engineering control;
- A summary of environmental conditions anticipated in the work areas, 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 the Occupational Safety & Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.120 regulations (USDL 2013);
- A copy of the Contractor's Health and Safety Plan (HASP) in electronic format, which uses the HASP provided in Appendix C of the SMP as a guide;

- A copy of the Contractor's Stormwater Pollution Prevention Plan (SWPPP) in electronic format, which uses the SWPPP provided in Appendix F of the SMP as a guide;

- Identification of disposal facilities for the excavated material;

- Identification of sources of any anticipated backfill, along with all required chemical testing results; and

- Truck transport routes.

Additionally, except in the event of an emergency requiring action to prevent or respond to a release or imminent threat of release, the NYSDEC is required to be notified and approval obtained within seven days in advance of any intrusive activities or activities involving maintenance of the riprap above or below the mean high water (MHW) line, placed along the river (see Appendix A to the SMP). However, any general inspection of the riprap, above or below the MHW line, will not require any such notification or permission from the NYSDEC.

3. Soil Screening Methods

It is preferable that no remaining black ash material be transported offsite. However, if the Contractor must remove remaining black ash material from the Site, soil will be screened visually by a qualified environmental professional during all excavations into remaining black ash material (known or potential). Soil will be screened regardless of timing of the invasive work and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the Certificate of Completion (i.e., the Covenant Not to Sue).

Excavated soils will be segregated into material that can be returned to the subsurface, material that requires off-site disposal, and material that can be used as cover soil.

4. Stockpile Methods

Surface water diversion methods and protection will be implemented/used as necessary to minimize the amount of surface water that enters the areas actively under construction. Water diversion methods and/or controls may include hay bales/silt fence or channeling potential surface flow around the active area by placing a temporary berm (e.g., soil berm, jersey barriers). Hay bales will be used as needed near catch basins, surface waters, and other discharge points, as appropriate.

Stockpiles will be kept covered at all times with an appropriately anchored impermeable cover(s) to prevent precipitation from entering into the stockpile area when not in use. Stockpiles will be routinely inspected, at a minimum of once each week and after every storm event, and damaged impermeable cover(s) will be promptly replaced. Results of inspections will be recorded in a logbook, maintained at the Site, and made available for inspection by NYSDEC during excavation activities. Inspection logs will be provided in the Periodic Review Report prepared for the Site in accordance with the SMP.

5. Materials Excavation and Potential Load Out

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and potential load-out of excavated material. It is preferable that no excavated remaining black ash material be removed from the Site.

The Owner of the property and its Contractors are solely responsible for the safe execution of all excavation and other intrusive work performed under this EWP.

The presence of utilities and easements (see Appendix A of the SMP for the existing Environmental Easement) on the Site will be investigated by the qualified environmental professional to determine whether utilities or easements on the Site pose a risk or impediment to the planned work under this EWP.

Under this EWP, material will be excavated in accordance with the notification made for the work as described in Section 1. The Contractor will use appropriate equipment based on Site conditions and scope of work, and will avoid impacts to wetlands.

For some excavations (e.g., post holes, shallow foundations), material imported as soil cover material and/or other fill material during the 2012 remedial activities may be segregated for future reuse on site. Such material should be staged separately from other excavated material. Material to be tested for off-site transport will transported to a temporary staging area(s) that is sized proportionally to the amount of material to be handled. Once at the staging area, excavated material will be dewatered, processed, and stabilized as necessary. Dewatered materials will be stockpiled at the staging area for potential load out.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New York State Department of Transportation requirements (and all other applicable transportation requirements).

The qualified environmental professional will be responsible for ensuring that all outbound trucks will be cleaned before leaving the Site until the activities performed under this section are complete. 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. Adjacent streets will be cleaned as needed to keep them free of site-derived materials.

6. Materials Transport Off Site

All transport of Site materials off site will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations, including New York Codes, Rules, and Regulations Title 6 (6 NYCRR) Part 364 (NYSDEC 2006a). Haulers will be appropriately licensed and trucks properly placarded. All materials proposed to be taken off site shall only be transported to a NYSDEC-approved location(s).

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 must be proposed in the notification (see Section 1), and once such routes are approved by NYSDEC, all trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes. Proposed route(s) shall 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; (f) overall safety in transport; and (g) community input [where necessary].

Trucks will be prohibited from stopping and idling in the neighborhood outside the Site. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials.

7. Materials Disposal Off Site

All remaining black ash material excavated and removed from the Site will be treated as regulated material (unless chemical testing suggests otherwise) and will be transported and disposed in accordance with all local, state (including 6 NYCRR Part 360 [NYSDEC 1999]) and federal regulations. If disposal of remaining black ash 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 material will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility (e.g., solid waste landfill, construction/demolition recycling facility), if appropriate. Additional analysis may be needed to characterize the material for off-site disposal based on the requirements of the disposal facility. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, laboratory test results, facility acceptance letters, manifests, bills of lading, and facility receipts.

Non-hazardous historical fill to be taken off site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2 (NYSDEC 1999). Material that does not meet Track 1 unrestricted soil cleanup objectives is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360-16 Registration Facility).

8. Materials Reuse On Site

Material may only be reused on site with prior NYSDEC approval. Chemical criteria for on-site reuse of material have been approved by NYSDEC and are in accordance with *Technical Guidance for Site Investigation and Remediation* (NYSDEC DER-10; NYSDEC 2010). The qualified environmental professional will ensure that procedures defined for materials reuse in this EWP are followed and that unacceptable material does not remain on site. On-site material, including historical fill and remaining black ash material, that is acceptable for reuse on site will be placed below a soil cover, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Steps for reuse of material onsite may include:

- Removal of a minimum of 12 inches of cover soil from the area at which reused material will be placed. Cover soil material must be removed without mixing with the underlying remaining black ash material;
- Placement of reused excavated material over the area of removed cover soil;
- Proper compaction of material placed to avoid excessive settlement;
- Grading of area to mitigate ponding and facilitate drainage; and
- Replacement of cover soil and restoration with appropriate mulch and seed.

Any demolition material encountered and proposed for reuse on site will be sampled for asbestos and lead. The results will be reported to the NYSDEC for acceptance. Concrete will not be crushed or processed on site without prior NYSDEC approval. Organic matter (e.g., wood, roots, stumps) or other solid waste derived from clearing and grubbing of the Site may be reused on site with prior NYSDEC approval.

9. Fluids Management

All liquids to be removed from the Site, including excavation dewatering, will be handled, transported, and disposed in accordance with applicable local, state, and federal regulations. Dewatering fluids will not be recharged back to the land surface or subsurface of the Site, but will be managed off site, unless otherwise approved by the NYSDEC.

Water generated during large-scale construction activities to surface waters (i.e., a local pond, stream or river) will be discharged under a State Pollutant Discharge Elimination System permit.

10. Soil Cover Restoration

After the completion of soil removal and any other invasive activities, the soil cover will be restored in a manner that complies with the AOC and NYSDEC-approved RAWP. Changes to the type of cover system from that which exists prior to the excavation (e.g., a soil cover is replaced by asphalt) will constitute a modification of the cover element of the remedy. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the 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 comply with provisions in this EWP prior to receipt at the Site. 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 6 NYCRR 375-6.7(d) (NYSDEC 2006b). Based on an evaluation of the land use, the off-site materials must meet 6 NYCRR Part 375 restricted residential use soil cleanup objectives. 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. All imported soils will be stored by type, separate from one another. All imported soils must be stored in accordance with federal, state, and local regulations for proper erosion control requirements, such as covering, while temporarily stockpiled on site prior to use.

12. Stormwater Pollution Prevention

For projects that disturb an area greater than 1 acre, a SWPPP that conforms to the requirements of NYSDEC Division of Water guidelines and New York State regulations will be prepared (and included in the Notification; see Section 1). Specifically, at a minimum, erosion and sediment controls will be installed and maintained in accordance with the *New York Standards and Specifications for Erosion and Sediment Control* (NYSDEC 2005), unless otherwise noted.

At a minimum, the SWPPP will include the following best management practices, as applicable:

- Barriers and hay bale check dams will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook, maintained at the Site, and made available for inspection by NYSDEC. All necessary repairs will be made immediately.
- Accumulated sediments will be removed as required to keep the barriers and hay bale check dams functional.
- All undercutting or erosion of the silt fence toe anchor will 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 will be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they will 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.

An example SWPPP is provided in Appendix F to the SMP; however, this plan may require modification based on the detailed description of the work to be performed, as included in the notification to be submitted to NYSDEC in compliance with this EWP.

13. Contingency Plan

The objective of a Contingency Plan is to minimize uncertainties by establishing the provisions and procedures for responding to certain circumstances, including discovery of an unknown source of constituents that may require remediation (e.g., underground storage tanks, stained soil, and drums), accidental spills, and discharges that may occur during any excavation work. Prior to beginning an excavation activity, task- or work-specific contingency procedures will be developed and included in the appropriate HASP as described in the SMP. Additionally, the following procedures will be implemented, as applicable:

- If underground tanks, stained soil, drums, or other previously unidentified sources are encountered 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, as necessary, to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (Target Analyte List [TAL] metals; Target Compound List [TCL] volatiles and semi-volatiles, TCL pesticides, and polychlorinated biphenyls [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 impacted media 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 (800-457-7362). These findings will also be included in the Periodic Review Reports prepared pursuant to Section 5 of the SMP.

- Precautions should be implemented to ensure slope stability and general ground stability in areas of viscous soils, remaining impacted material, or sludge-like material.

14. Air Monitoring Plan

An Air Monitoring Plan, or a section devoted to air monitoring, must be included in the HASP specific to the excavation work proposed at the Site, and must be submitted to NYSDEC. This air monitoring section should include, at a minimum:

- Details of the perimeter air monitoring program;
- Action levels to be monitored;
- Methods for air monitoring;
- Analytes measured and instrumentation to be used; and
- A figure showing locations of all air monitoring instrumentation.

A figure showing the locations of air sampling stations based on generally prevailing wind conditions will be provided in the Notification made for the work (as described in Section 1). These locations may be adjusted daily or more frequently based on actual wind directions to provide an upwind and at least two downwind monitoring data points. Exceedances of action levels identified in the Air Monitoring Plan will be reported to NYSDEC and New York State Department of Health Project Managers (i.e., John Swartwout and Krista Anders, respectively).

15. Dust Control Plan

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

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas, including excavations and stockpiles.
- Larger sites will be cleared and grubbed 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 low-dust road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

16. Other Nuisances

A plan will be developed and employed by the Contractor for all remedial work to ensure compliance with local noise control ordinances.

17. References

ARCADIS. 2012. Remedial Action Work Plan. Prepared for Georgia-Pacific LLC. May.

New York State Department of Environmental Conservation (NYSDEC). 1999. 6 NYCRR Part 360: Solid Waste Management Facilities. Revised November 24, 1999. Available online at: http://www.epa.gov/osw/nonhaz/industrial/special/fossil/new-york.pdf.

NYSDEC. 2005. New York Standards and Specifications for Erosion and Sediment Control. August 2005. Available online at: http://www.dec.ny.gov/docs/water_pdf/bluebook.pdf.

NYSDEC. 2006a. 6 NYCRR Part 364: Waste Transporter Permits. Amended May 12, 2006. Available online at: http://www.dec.ny.gov/regs/4394.html.

NYSDEC. 2006b. 6 NYCRR Part 375: Environmental Remediation Programs. Effective December 14, 2006. Available online at: http://www.dec.ny.gov/docs/remediation_hudson_pdf/part375.pdf.

NYSDEC. 2010. NYSDEC DER-10: Technical Guidance for Site Investigation and Remediation. Issuance Date: May 3. Available online at: http://www.dec.ny.gov/regulations/67386.html.

NYSDEC. 2011. Order on Consent and Administrative Settlement for the Willsboro Black Ash Pond Site (Index #A5-0771-07-11, Site # 516009). August 23.

United States Department of Labor (USDL). 2013. Occupational Safety & Health Administration Standards for Hazardous Materials 29 CFR 1910.120. Available online at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9765.

Appendix D

Health and Safety Plan

ARCADIS
Infrastructure · Water · Environment · Buildings

Site Specific Health and Safety Plan

Version 1, May 31, 2012

Project Name: Willsboro Black Ash Pond Site
Willsboro, New York

Project Number: B0066127.0001.00001
Client Name: Georgia-Pacific, LLC
Date: May-12
Revision: 2

Approvals:

HASP Developer: Lauren Putnam

HASP Reviewer: Thomas Burgess

Project Manager: Lance Ketcham, P.E./Dawn Penniman, P.E.

Emergency Information

Site Address: School Street
Willsboro, NY 12996

Emergency Phone Numbers:

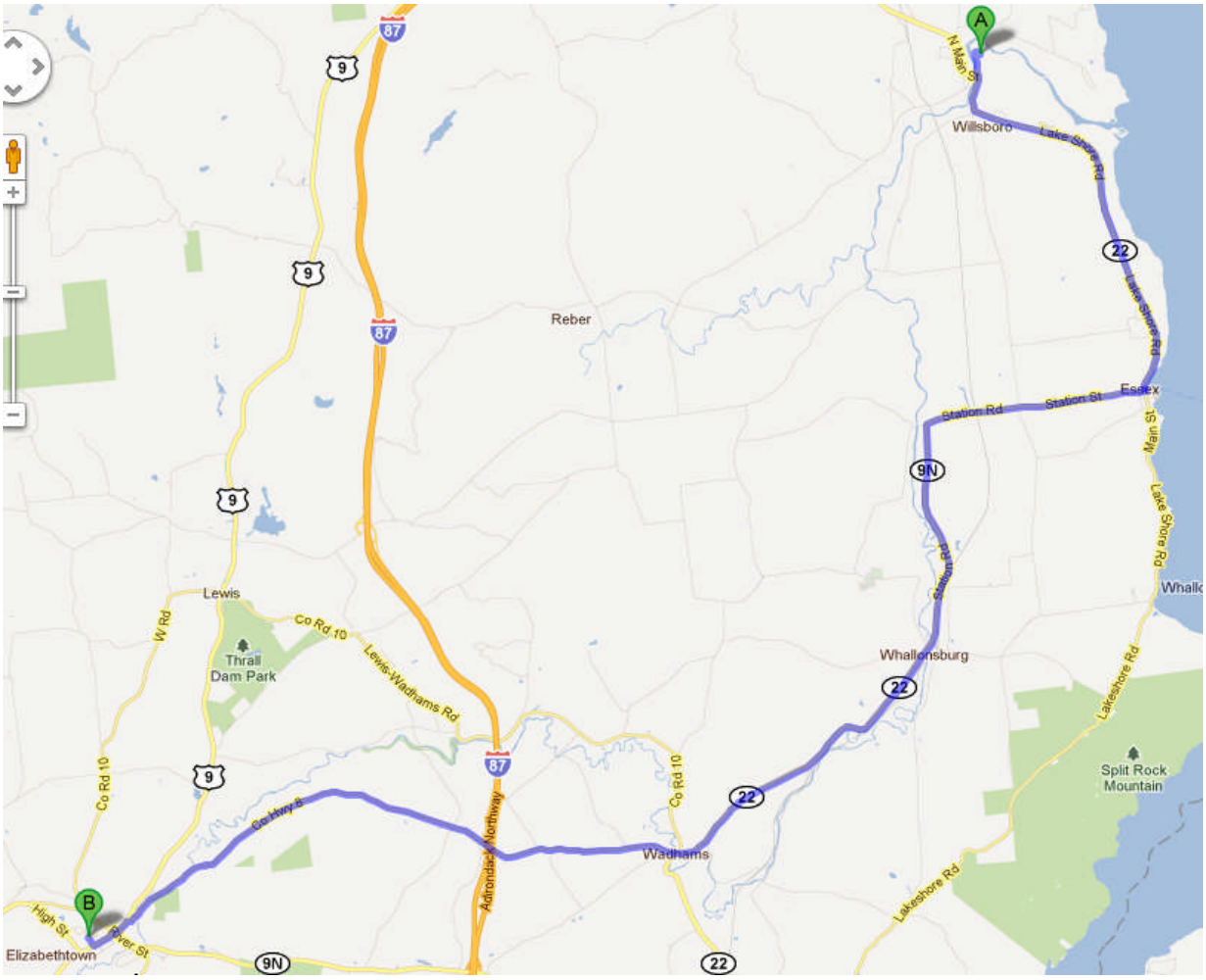
Emergency (fire, police, ambulance)		911
Emergency (facility specific, if applicable)		
WorkCare		1-800-455-6155
Project H&S (specify)	N/A	N/A
Corporate Health and Safety		1-720-344-3500
ARCADIS Near Loss Reporting Hotline		1-866-242-4304

Hospital Name and Address: Elizabethtown Community Hospital
75 Park Street
Elizabethtown, New York 12932

Hospital Phone Number: (518) 873-6377

Route to Elizabethtown Community Hospital
75 Park St, Elizabethtown, NY12932

1. Head northwest on School St. toward NY-22 N/S Main St. (0.4 mi).
2. Continue straight onto NY-22 S/S Main St., continue to follow NY-22 (4.9 mi).
3. Turn right onto NY-22 S/Station St., continue to follow NY-22 (9.3 mi).
4. Slight right onto Elizabethtown-Wadhams Rd (7.0 mi).
5. Turn left onto US-9 S/Maple St, continue to follow US-9 S (0.5mi).
6. Take second right onto Park St., destination will be on right (0.1 mi).



General Information

Site Type (select all applicable):

- ☐ Active
- ☑ Inactive
- ☐ Secure
- ☑ Unsecured
- ☐ Residential
- ☐ Retail
- ☐ Commercial
- ☐ Industrial
- ☐ Government
- ☐ Utility
- ☐ Landfill
- ☐ Roadway
- ☐ Railroad
- ☐ Marine
- ☑ Remote Area
- ☐ Unknown
- ☐ Other (specify): _____

Surrounding Area and Topography (select one):

- ☑ Surrounding area and topography are presented in the project work plan
- ☐ Surrounding area and topography (*briefly describe*):

Site Background (select one):

- ☑ Site background is presented in the project work plan
- ☐ Site background (*briefly describe)*:

Project Tasks

The following tasks are identified for this project:

	Examples: "Drilling/soil sampling", "Surveying", "Inspections"	Supporting Document(s)			
		JLA	Field H&S Handbook	STAR Plan or TCP	Other (specify below)
1	Driving	☑	☑	☐	☐
2	Construction Observation	☑	☑	☐	☐
3	Drilling	☑	☑	☐	☐
4	Surveying	☑	☑	☐	☐
5	Earthwork/Excavation	☑	☑	☐	☐
6		☐	☐	☐	☐

☐ Subcontractor supplied H&S information is attached

Print any relevant JLAs for this scope of work and attach.

FHSHB and/or applicable STAR Plan/TCP are required to be on site even if not referenced above.

Other (state document and if attached):

☑ Utility clearance required?

Roles and Responsibilities

	Name	*Role*	*Additional Responsibilities*
1	Dawn Penniman, P.E.	PM	
2	Lance Ketcham, P.E.	PM/MP	
3			
4			
5			
6			

Training

All ARCADIS employees are required to have the following training:	*Selected ARCADIS employees are required to have the following additional training:*	Names or Numbers from above
☑ 40 hr HAZWOPER w current refresh.	☐ Not applicable	
☐ 24 hr HAZWOPER	☑ First aid/CPR/BBP	
☐ 10 hr Construction	☐ 30 hr Construction	
☐ HazMat #1 (Ground/Air/MOT)	☐ 10 hr Construction	
☐ HazMat #4 (MOT)	☐ HazMat #1 (Gr./Air/MOT)	
☐ HazCom/Emergency Action Plan	☐ HazMat #4 (MOT)	
☐ LPS (classroom); or	☐ Confined space entrant	
☑ LPS (on-line)	☐ Confined space rescue	
☑ PPE	☐ Excavation CP	
☐ Respiratory protection	☐ Electrical (NFPA 70E)	
☐ Smith System (hands on)	☐ Lockout/Tagout	
☑ Smith System (on-line)	☐ LPS (classroom)	
☐ OTS/eRailsafe	☐ OTS/eRailsafe	
☐ Client specific:	☑ Smith Sys. (hands on)	
	☐ Boating safety	
☐ Other:	☐ Other:	

☑ ARCADIS subcontractors are also required to have the above training applicable to all employees.

Hazard Analysis

Rank the hazards using HIGH (H), MEDIUM (M) or LOW (L) based on current site knowledge. For hazards that are not applicable, leave blank. Use results of this analysis to verify controls in the JLA, FHSHB or other supporting document are adequate to mitigate task hazards. When in the field, use the Tailgate Safety Meeting Form for task specific evaluation of task hazards.

Rank the hazards using the chart below:

Severity	Consequence		Probability				
	Property Damage	Injury	Frequent	Likely	Occasional	Seldom	Unlikely
	> $100,000	Fatality	H	H	H	H	M
	> $10,000	Injury Requiring Hospitalization	H	H	H	M	L
	> $1000	Injury Requiring Medical Treatment Beyond First Aid	H	M	M	L	L
	< $1000	Injury Requiring First Aid	M	L	L	L	L

Use TRACK and identify rank relevant hazards expected to be encountered on this project:

Biological

L	Biting/stinging insects
L	Biting animals
L	Poisonous plants
L	Phys. damaging plants

Driving

L	Night driving
M	Off-road driving
L	Urban driving
L	All terrain vehicle
	Boat

Electrical

M	Wet environments
L	Electrical panels
L	Electric utilities
L	Electric power tools

Environment

M	Heat
M	Cold
L	Lightning
M	Inclement weather
L	High wind

Gravity

M	Slip, trip, fall
L	Fall from height
L	Ladders or scaffolds
L	Struck by falling object

Mechanical

M	Cuts on equipment/tools
M	Pinch points on equipment
L	Burns from equipment
M	Struck by equipment

Motion

M	Lifting/awkward body positions
M	Struck by vehicle/traffic

Personal Safety

M	Working late/night
L	Working alone
L	High crime area

Pressure

L	Utilities (gas, water, etc)
L	Compressed gas cylinders
L	Compressed air/aerosols
L	Hydraulic systems

Sound

M	Equipment noise
L	Tool noise
L	Traffic noise (vehicle/train/etc)

Comments:

Chemical/Radiation

☐	Not applicable
	General
	Dusts, toxic
	Dusts, nuisance
	Chemicals, ARCADIS use
	Chemicals, corrosive
	Chemicals, explosive
	Chemicals, flammable
	Chemicals, oxidizing
	Chemicals, toxic
	Chemicals, reactive
	Radiation, ionizing
	Radiation, non-ionizing

Other:

Compound Specific:

	Asbestos
	Benzene
	Cadmium
	Hydrogen sulfide
	Lead
	Silica

Hazard Communication (HazCom)

List the chemicals anticipated to be used by ***ARCADIS*** *on this project subject to HazCom requirements.*
(Modify quantities as needed)

	Acids/Bases	Qty
☑	Not applicable	
☐	Hydrochloric acid	<500 ml
☐	Nitric acid	<500 ml
☐	Sulfuric acid	<500 ml
☐	Sodium hydroxide	<500 ml
☐	Zinc acetate	<500 ml
☐	Ascorbic acid	<500 ml
☐	Acetic acid	<500 ml
☐	Other:	
	_____	
	_____	
	_____	
	_____	

	Decontamination	Qty
☑	Not applicable	
☐	Alconox	≤ 5 lbs
☐	Liquinox	≤ 1 gal
☐	Acetone	≤ 1 gal
☐	Methanol	≤ 1 gal
☐	Hexane	≤ 1 gal
☐	Isopropyl alcohol	≤ 4 gal
☐	Nitric acid	≤ 1 L
☐	Other:	
	_____	
	_____	
	_____	
	_____	

	Calibration	Qty.
☑	Not applicable	
☐	Isobutylene/air	1 cyl
☐	Methane/air	1 cyl
☐	Pentane/air	1 cyl
☐	Hydrogen/air	1 cyl
☐	Propane/air	1 cyl
☐	Hydrogen sulfide/air	1 cyl
☐	Carbon monoxide/air	1 cyl
☐	pH standards (4,7,10)	≤ 1 gal
☐	Conductivity standards	≤ 1 gal
☐	Other:	
	_____	
	_____	

	Fuels	Qty.
☑	Not applicable	
☐	Gasoline	≤ 5 gal
☐	Diesel	≤ 5 gal
☐	Kerosene	≤ 5 gal
☐	Propane	1 cyl
☐	Other:	
	_____	

	Kits	Qty.
☑	Not applicable	
☐	Hach (specify):	_____ 1 kit
☐	DTECH (specify):	_____ 1 kit
☐	EPA 5035 Soil (specify kit):	_____ 1 kit
☐	Other:	
	_____	_____
	_____	_____

	Remediation	Qty.
☑	Not applicable	
☐	_____	
☐	_____	
☐	_____	
☐	_____	
☐	_____	

	Other:	Qty.
☑	Not applicable	
☐	Spray paint	≤ 6 cans
☐	WD-40	≤ 1 can
☐	Pipe cement	≤ 1 can
☐	Pipe primer	≤ 1 can
☐	Mineral spirits	≤ 1 gal

		Qty.
☐	_____	
☐	_____	
☐	_____	
☐	_____	
☐	_____	
☐	_____	

Material safety data sheets (MSDSs) must be available to field staff. Manufacturer supplied MSDSs are preferred, however, if the manufacturer's MSDS can not be located, use the source provided below. Indicate below how MSDS information will be provided:

☑ Not applicable
☐ Printed copy in company vehicle
☐ Printed copy in the project trailer/office
☐ Printed copy attached
☐ Electronic copy on field computer

☐ Bulk quantities of the following materials will be stored: _____

Contact the project H&S contact for information in determining code and regulatory requirements associated with bulk storage of materials.

Monitoring

☑ Chemical air monitoring is not required for this project.

For projects requiring air monitoring, list the relevant constituents representing a hazard to site workers.

Constituent	Max. Conc.	Units	TWA		STEL		IDLH		LEL/UEL	VD	VP	IP
				Units		Units		Units	(%)	Air=1	(mm Hg)	(eV)
None		ppm	9999	-	0	-	0	-	0	0	0	0
None		ppm	9999	-	0	-	0	-	0	0	0	0
None		ppm	9999	-	0	-	0	-	0	0	0	0
None		ppm	9999	-	0	-	0	-	0	0	0	0
None		ppm	9999	-	0	-	0	-	0	0	0	0
None		ppm	9999	-	0	-	0	-	0	0	0	0

Notes: TWAs are ACGIH 8 hr-TLVs unless noted.
p-ppm m-mg/m3 c2- ceiling (2 hr) se-sensitizer "#N/A" -Constituent is not in database, manually enter information
s- skin c-ceiling "9999" - NA O-OSHA PEL
r- resipirable i-inhalable N-NIOSH 10 hr REL

Monitoring Equipment and General Protocols

Air monitoring is required for any task or activity where employees have potential exposure to vapors or particulates above the TWA. Action levels below are appropriate for most situations. Contact the project H&S contact for all stop work situations. Check instruments to be used.

Monitoring Frequency: _____

	Instrument				Actions
☐	Photoionization Detector		<	0.000	Continue work
		0.000	-	0.0	Sustained >5 min. continuous monitor, review eng. controls and PPE, proceed with caution
	Lamp (eV):		>	0.0	Sustained >5 min. stop work, contact SSO
☐	Flame Ionization Detector (FID)		<	0.0	Continue work
		0.0	-	0.0	Sustained >5 min. continuous monitor, review eng. controls and PPE, use caution
			>	0.0	Sustained >5 min. stop work, contact SSO
☐	LEL/O2 Meter	0-10% LEL			Continue work
		>10-25% LEL			Continuous monitor, review eng. controls, proceed with caution
		>25% LEL			Stop work, evacuate, contact SSO
		19.5%-23.5% O2			Normal, continue work
		<19.5% O2			O2 deficient, stop work, evacuate, cont. SSO
		>23.5% O2			O2 enriched, stop work, evacuate, contact SSO
☐	Colorimetric Indicator Tube (CIT)	≤PEL/TLV			Continue work
		>PEL/TLV			Stop work, review eng. controls and PPE, contact SSO
	Compound(s):				
☐	Sound Level Meter or Dosimeter	>80 dBA, sustained			Monitor continuously, continue work
		>85 dBA, sustained			Review controls, use hearing protection
		Result dBA-(NRR-7dBA)>90dBA			Stop work, contact SSO
☑	Particulate Monitor (mists, aerosols, dusts in mg/m^3)		<	2.5	Continue work
		2.5	-	5.00	Use engineering controls, monitor continuously
			>	5.00	Stop work, review controls, contact SSO
☐	Radiation Survey Meter	Specify:			Specify:
☑	Other: Visual monitoring for dust	Specify:			Specify: If dust is observed, actions will be taken to minimize the visible dust (i.e., modifying construction activities, utilizing a water truck)

Personal Protective Equipment (PPE)

See JLA for the task being performed for PPE requirements. *If the work is not conducted under a JLA, refer to the governing document for PPE requirements. At a minimum, the following checked PPE is required for* <u>*all tasks during field work*</u> *not covered by a JLA on this project:*

Level D or Level D Modified:

							Specify Type:
☑	Hard hat	☐	Snake chaps/guards	☐	Coveralls:		
☑	Safety glasses	☐	Briar chaps	☐	Apron:		
☐	Safety goggles	☐	Chainsaw chaps	☐	Chem. resistant gloves:		
☐	Face shield	☐	Sturdy boot	☑	Gloves other:		Work Gloves
☑	Hearing protection	☑	Steel toe boot	☐	Chemical boot:		
☐	Rain suit	☐	Metatarsal boot	☐	Boot other:		
☐	Other:			☑	Traffic vest:		Reflective
				☐	Life vest:		

Task specific PPE: A Personal Flotation Device/Life Vest will be required to be worn by workers who are working within 10 feet of the water.

Comments:

Medical Surveillance (*check all that apply*)

- ☐ Medical Surveillance is not required for this project.
- ☑ HAZWOPER medical surveillance applies to all ARCADIS site workers on the project.
- ☑ HAZWOPER medical surveillance applies to all subcontractors on the project.
- ☐ HAZWOPER medical surveillance applies to all site workers on the project except:

- ☐ Other medical surveillance required (describe type and who is required to participate):

- ☐ Client drug and/or alcohol testing required.

Hazardous Materials Shipping and Transportation (*check all that apply*)

- ☑ Not applicable, no HazMat will be transported or shipped
- ☐ A Shipping Determination has been reviewed and provided to field staff
- ☐ A Shipping Determination is attached
- ☐ All HazMat will be transported under Materials of Trade by ARCADIS
- ☐ Other (specify):

Roadway Work Zone Safety (*check all that apply*)

- ☑ Not applicable for this project.
- ☐ All or portions of the work conducted under a TCP
- ☐ All or portions of the work conducted under a STAR Plan
- ☐ TCP or STAR Plan provided to field staff
- ☐ TCP or STAR Plan attached
- ☐ Other (specify):

ARCADIS Commercial Motor Vehicles (CMVs)

This section is applicable to ARCADIS operated vehicles only

- ☑ This project will **<u>not</u>** utilize CMV drivers
- ☐ This project will utilize CMV drivers

Site Control (*check all that apply*)

- ☐ Not applicable for this project.
- ☐ Site control protocols are addressed in JLA or other supporting document (attach)
- ☐ Maintain an exclusion zone of _____ ft. around the active work area
- ☐ Site control is integrated into the STAR Plan or TCP for the project
- ☐ Level C site control - refer to Level C Supplement attached
- ☑ Other (specify):
  Existing project controls in place. Additional fencing may be added to control vehicle access to staging area.

Decontamination (*check all that apply*)

- ☐ Not applicable for this project.
- ☐ Decontamination protocols are addressed in JLA or other governing document (attach)
- ☑ Level D work- wash hands and face prior to consuming food, drink or tobacco.
- ☐ Level D Modified work- remove coveralls and contain, wash hands and face prior to consuming food, drink or tobacco. Ensure footwear is clean of site contaminants
- ☐ Level C work - refer to the Level C supplement attached.
- ☐ Other (specify):

Sanitation *(check all that apply)*

- ☑ Mobile operation with access to off-site restrooms and potable water
- ☑ Restroom facilities on site provided by client or other contractor
- ☐ Project to provide portable toilets (1 per 20 workers)
- ☐ Potable water available on site
- ☐ Project to provide potable water (assume 1 gal./person/day)
- ☐ Project requires running water (hot and cold, or tepid) with soap and paper towels

Safety Briefings (*check all that apply*)

- ☑ Safety briefing required daily
- ☐ Safety briefing required twice a day
- ☐ Safety briefings required at the following frequency: _____
- ☑ Subcontractors to participate in ARCADIS safety briefings
- ☑ ARCADIS to participate in client/contractor safety briefings
- ☐ Other (specify):

Safety Equipment and Supplies

Safety equipment/supply requirements are addressed in the JLA for the task being performed. *If work is not performed under a JLA, the following safety equipment is required to be present on site in good condition (Check all that apply):*

- ☑ First aid kit
- ☑ Bloodborne pathogens kit
- ☑ Fire extinguisher
- ☐ Eyewash (ANSI compliant)
- ☐ Eyewash (bottle)
- ☑ Drinking water
- ☐ Other: _____

- ☐ Insect repellent
- ☐ Sunscreen
- ☐ Air horn
- ☐ Traffic cones
- ☐ 2-way radios
- ☐ Heat stress monitor

_____

Task Improvement Process (TIP) Program (*check all that apply*)

☐ TIP metrics are provided on the account level, refer to account guidance
☑ TIP required at the following frequency on this project:
Select One: 400 mhrs _____ time(s) _____ Define: _____
☐ Field Assessment required at the following frequency on this project:
Select One: _____ mhrs _____ time(s) _____ Define: _____
☐ Other (specify):

List tasks anticipated for TIP activity:

_____
_____
_____
_____

For successful TIPs, schedule feedback sessions with supervisor in advance!

Signatures

I have read, understand and agree to abide by the requirements presented in this health and safety plan. I understand that I have the absolute right to stop work if I recognize an unsafe condition affecting my work until corrected.

Printed Name	Signature	Date

Add additional sheets if necessary

☐ Subcontractor Acknowledgement Form attached

You have an absolute right to STOP WORK if unsafe conditions exist!

Attachment A
ARCADIS Tailgate Meeting Checklist

ARCADIS

Document Control Number:TGM - _____

TGM + *project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year*

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: Station No. 5 Hydroelectric Project			**Project Location: Rochester, New York**
Date:	**Time:**	**Conducted by:**	**Signature/Title:**
Client:		**Client Contact:**	**Subcontractor companies:**

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 _____ 3 _____ 5 _____

2 _____ 4 _____ 6 _____

Other Hazardous Activities - Check the box if there are any other ARCADIS, Client or other party activities that may pose hazards to ARCADIS operations ☐ If there are none, write "None" here: _____

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit

	Doc #		Doc #		Doc #
☐ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Any Stop Work Interventions
☐ Any corrective actions from	☐ Will any work deviate from plan?	☐ If deviations, notify PM & client
☐ JLAs or procedures are available?	☐ Field teams to "dirty" JLAs, as	☐ All equipment checked & OK?
☐ Staff has appropriate PPE?	☐ Staff knows Emergency Plan (EAP)?	☐ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ trips) (L M H)	☐ water) (L M H)	☐ motors) (L M H)
☐ lightning) (L M H)	☐ wells) (L M H)	☐ cold, ice) (L M H)
☐ paint) (L M H)	☐ ivy) (L M H)	☐ laser) (L M H)
☐ generators) (L M H)	☐ not fit) (L M H)	☐ dozer) (L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAs, and other control processes. Discuss and document any additional control processes.

☒	**STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)				
☐	Elimination	☐	Substitution	☐	Isolation
☐	Engineering controls	☐	Administrative controls	☐	Monitoring
☐	General PPE Usage	☐	Hearing Conservation	☐	Respiratory Protection
☐	Personal Hygiene	☐	Exposure Guidelines	☐	Decon Procedures
☐	Emergency Action Plan (EAP)	☐	Fall Protection	☐	Work Zones/Site Control
☐	JLA to be developed/used ***(specify)***	☐	LPO conducted ***(specify job/JLA)***	☐	Traffic Control
☐		☐		☐	Other ***(specify)***
☐		☐		☐	

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at 1.800.455.6155 and then notify the field supervisor who will, in turn, notify Corp H&S at 1.720.344.3844.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify Corp H&S at 1.720.344.3844 and then Corp Legal at 1.720.344.3756.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify Corp Legal at 1.678.373.9556 and Corp H&S at 1.720.344.3500

Visitor Name/Co - not involved in work

	In	Out
	In	Out
	In	Out
	In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- ☐ Lessons learned and best practices learned today: _____
- ☐ Incidents that occurred today: _____
- ☐ Any Stop Work interventions today? _____
- ☐ Corrective/Preventive Actions needed for future work: _____
- ☐ Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.800.455.6155
Near Loss Hotline - 1.866.242.4304

Attachment B
PPE Checklist

R = Equipment required to be present on the site. **O** = Optional equipment. Subcontractors must have the same equipment listed here as a minimum.

Description (Put Specific Material or Type in Box)	Level Of Protection		
	D	C	B
Body			
Coveralls			
Chemical Protective Suit (include type in cell, e.g., Tyvek, Saranex, PVC, etc.)			
Splash Apron			
Rain Suit	O		
Traffic Safety Vest (reflective) or Reflective T-Shirt	R		
Head			
Hard Hat (if does not create other hazard)	R		
Head Warmer (depends on temperature and weather conditions)	O		
Eyes & Face			
Safety Glasses (incorporate sun protection as necessary)	R		
Goggles (based on hazard)			
Splash Guard (based on hazard)			
Ears			
Ear Plugs	R		
Ear Muffs	O		
Hands and Arms			
Outer Chemical Resistant Gloves (specify the type of glove based on chemical hazard)			
Inner Chemical Resistant Gloves (specify the type of glove based on chemical hazard)			
Insulated Gloves			
Work Gloves*	R		
Foot			
Safety Boots (steel toe and shank)	R		
Rubber, Chemical Resistant Boots			
Rubber Boots			
Disposable Boot Covers			
Respiratory Protection			
1/2 Mask APR			
Full Face APR			
Dust Protection			
Powered APR			
SCBA			
Air Line			

Attachment C
JSA's

Job Safety Analysis

General

JSA ID	5203	**Status**	(3) Completed
Job Name	General Industry-Driving - passenger vehicles	**Created Date**	5/27/2011
Task Description	Driving to project sites and offices.	**Completed Date**	05/27/2011
Template	True	**Auto Closed**	False

Client / Project

Client	
Project Number	00000000TEST
Project Name	test
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Oakeson, Brent	9/16/2011	5/27/2011	Casaletta, Robert	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Preforming Pre-trip inspections and adjustments.	1	Failure to conduct pre- trip inspection of vehicle can lead to vehicle accident.	Use TRACK to conduct inspection of the vehicle. Walk around vehicle to check tire pressure, signs of leaking fluids, overall vehicle condition. Use vehicle inspection checklist.	
		2	Failure to adjust mirrors, seats, and controls prior to driving can lead to vehicle accident.	Adjust all mirrors, seats and vehicle controls prior to driving vehicle. Become familiar with electronic controls, such as turn signals, windshield wipers, air conditioning, and radio prior to vehicle operation.	
2	Vehicle loading and unloading	1	Objects placed in the vehicle can obstruct the view of the driver in rear, side or blindspot view.	Avoid placing objects in a manner that obstructs your views in windows, mirrors, or blind spots.	
		2	Unsecure objects causing pedal, steering or gear shift obstruction or injury during vehicle operation.	Secure all loads in vehicle (both in the bed of trucks and in passenger cabin) to prevent unanticipated movement or shifting that could injure driver, passenger, or affect safe operation of vehicle.	
		3	Obstuction of vehicle safety equipment caused by object placment in vehicle.	Keep emergency equipment clear and unobstructed to ensure ready availablity.	
3	Vehicle operation	1	Failure to use Smith System "5-Keys" increases risk of accident and injruy.	Use Smith System "5-Keys", maintain space cushion around vehicle, maintain 4 second rule and add (second for each addtional hazard (wet roads, snow, etc). Brake gradual, keep eyes moving, check mirrors every 6-8 seconds, use turn signals, focus on relavent objects, use early lane positioning when approaching turns.	
		2	Injury or death from failure to wear seatbelt	Always wear seatbelts even if driving short distances off of a public roadway.	
		3	Cell phone use increases risk of accidnt and injury	Avoid using cell phones in any capacity when operating a vehicle, check client for cell use on project sites and follow requirements. Follow all local laws.	
		4	Use of radar detectors encourages speeding resulting in increased risk for accident or injury	Use of radar detectors and similar devices is prohibited.	
		5	Intruders attempting to enter vehicle while stopped at intersections and/or while it is vacant. Doors opening during an accident.	Lock doors before driving vehicle and always after leaving vehcile when it is stopped unless client requires vehicles to remain unlocked while onsite.	

4	Routine maintenance	1	Lack of routine vehicle maintenance can lead to engine and control failures, potential vehicle accident.	Vehicle should have routine maintenance and service to keep in good operating condition.	

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
	flashlight		Recommended
Traffic Control	Other	Roadway emergency kit	Recommended

Job Safety Analysis

General

JSA ID	2796	**Status**	(3) Completed
Job Name	Construction-Oversight - excavation and construction	**Created Date**	6/14/2010
Task Description	Excavation/Trenching Oversight (Outdoors)	**Completed Date**	06/17/2010
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Byers, Susan	6/14/2010	6/14/2010	Edwards, Lauren	☑
Developer	Moyers, Samuel	6/14/2010	6/14/2010	Coppola, Mija	☑
HASP Reviewer	Tremblay, Anthony	6/28/2010	6/17/2010	Coppola, Mija	☑
Quality Reviewer	Crandall, James	6/25/2010	6/25/2010	Johnson, Gary	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Utility Clearance	1	Contact with activities can cause injury, property damage and cause releases of hazardous substances to the environment.	Contact with activities can cause injury, property damage and cause releases of hazardous substances to the environment.	ARCHSFS019 - Utility Clearance HS Standard
		2	Slip trip and falls while performing site clearance activities	Focus on task at hand and do not hurry through task. Avoid reading maps/drawings while walking, stop walking when looking up for overhead utilities.	
2	Excavation/Trenching and Backfilling Oversight	1	Slips trips and falls from poor housekeeping around trench or excavation.	Maintain work area and minimize clutter near excavation. Place excavated material properly and at least 2 feet away from the edge of excavation. Remove potential hazards when possible. Mark hazards when it cannot be removed. Create and maintain awareness of hazard. Maintain barriers, fall hazard warning signage and traffic controls properly. Do not cross over caution tape, safety fencing etc. Follow Project specific STAR Plan	FHSHB IV(D)
		2	Excavation or trench collapse trapping workers or creating falls.	Excavation/Trench greater than five (5) feet deep in which subcontractor, employees or others will be entering must be properly sloped, benched, shored or have a trench box in place. Sloping, benching, shoring or use of trench box is not required IF an excavation is less than five (5) feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in. Ensure a Competent Person is on site to inspect and oversee excavation/ trenching activities. Where feasible, stay six (6) feet from edge of excavation/trench. A safe means of egress, such as a stairway, ladder, or ramp, shall be located so that no more than twenty-five (25) feet of lateral travel is necessary for site workers conducting activities in trenches exceeding four (4) feet in depth.	

2	Excavation/Trenching and Backfilling Oversight	3	Potential high level of dust, fumes, vapors or particulates creating visibility or inhalation/contact hazards could result in exposure above occupational exposure limit or create an IDLH atmosphere.	Visually monitor air for dust, and wet excavated soil as needed to control dust. Monitor for chemical vapors if hazard exists. The atmosphere must be tested in excavations greater than four (4) feet in depth where oxygen deficiency or toxic or flammable gases are likely to be present, before workers will be permitted to enter. Ensure downwind and perimeter monitoring also performed, if atmospheric hazards exists.	
		4	Excessive noise from excavating equipment or pumps.	Make sure all authorized personnel including subcontractors are wearing hearing protection (ear plugs/muffs) when working around noisy equipment. Increase distance from noise hazard when practical.	
		5	Potential Leaks of Petroleum Fluids and Lubricants from excavating equipment and support equipment.	Make sure all authorized personnel including subcontractors perform equipment inspections looking for leaks, cracked hoses, and loose fittings. Promptly and properly repair all leaks.	
		6	Open Excavation, Unauthorized Entry, or Property Damage	Make sure all authorized personnel including subcontractors mark open excavation with demarcation tape, orange fencing, orange cones, etc. to prevent unauthorized / accidental entry. Make sure controls are adequate for traffic protection after dark or when the site is unstaffed. Backfill excavation area as soon as possible and fence off any excavation not backfilled at the end of the work day.	
		7	Contact with potentially impacted groundwater and soil.	Conduct task in a calm, cautious manner. Wear appropriate PPE. Ensure equipment is in working conditions before start of work every day. Stop work immediately and report to the site manager, if any life threatening conditions exist.	
		8	Working Around Heavy Machinery	Where feasible, maintain distance from excavation equipment in excess of the swing radius. Maintain eye contact with operators at all time. Ensure equipment is in good working condition before work begins. Wear appropriate PPE, including safety vest. Do not wear loose clothing and pull back long hair. Be aware of and avoid standing in red zones (equipment operator "blind-spots"). No personnel are permitted to stand underneath suspended loads.	
3	Stockpile Maintenance and Sampling	1	Falls climbing on or during covering of stockpile.	Avoid climbing on stockpiles when possible, keep hands free, do not hurry trough tasks such as pulling plastic sheeting up onto or over piles.	
		2	Overexertion placing plastic sheeting, weight, and straw bales.	Use proper lifting techniques, avoid twisting of body, and forceful pulling/pushing. Do not hurry through task.	
		3	Cuts, scrapes, impalement from debris in stockpiles.	Have excavation contractor remove/isolate large chunks of concrete, exposed rebar etc. from stockpile to extent practical. Inspect areas prior to kneeling or placing hands when sampling upon stockpile.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	long sleeve shirt/pants		Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	When sampling groundwater	Required
	work gloves (specify type)	Leather when hand hazard exists; nitrile for soil/	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs	When working near heavy equipment	Required
Miscellaneous PPE	traffic vest--Class II or III		Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone	Remote area, check reception	Required
Decontamination	Decon supplies (specify type)		Required
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
	flashlight		Required
Personal	eye wash (specify type)		Required
	insect repellant		Recommended
Traffic Control	Other	Cones/tape to delineate trenches prior to backfill	Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Tremblay, Anthony HASP Reviewer Approve 6/17/2010	
Employee: **Role** **Review Type** **Completed Date**	Crandall, James Quality Reviewer NA 6/25/2010	No additional comments. Very well done.

Job Safety Analysis

General

JSA ID	44	**Status**	(3) Completed
Job Name	Environmental-Drilling, soil sampling, well installation and decommissioning	**Created Date**	2/4/2009
Task Description	Drilling, soil sampling and well installation	**Completed Date**	02/04/2009
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Coppola, Mija	4/5/2012	2/4/2009	Coates, Gary	☑
HASP Reviewer	Coppola, Mija	2/6/2009	2/2/2009	Coates, Gary	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Set up necessary traffic and public access controls	1	Struck by vehicle due to improper traffic controls	Use a buddy system for placing site control cones and/or signage. Position vehicle so that you are protected from moving traffic. Wear Class II traffic vest	
2	Utility Clearance	1	Potential to encounter underground or above ground utilities while drilling.	Complete utility clearance in accordance with the ARCADIS Utility Clearance H&S Standard.	ARCADIS H&S Standard ARCHSFS019
3	General drill rig operation	1	Excessive noise is generated by rig operation.	When the engine is used at high RPMs or soil samples are being collected, use hearing protection.	
		2	During drill rig operation, surfaces will become hot and cause burns if touched, and COCs in the soils more readily vaporize generating airborne contaminates.	Due to friction and lack of a drilling fluid, heat will be produced during this method. Mainly drill augers. Be careful handling split spoons. Wear proper work gloves. When soils and parts become heated, the COC could volatilize. Air monitoring should always be performed in accordance with the HASP.	
		3	Moving parts of the drilling rig can pull you in causing injury. Pinch points on the rig and auger connections can cause pinching or crushing of body parts.	Stay at least 5 feet away from moving parts of the drill rig. Know where the kill switch is, and have the drillers test it to verify that it is working. Do not wear loose clothing, and tie long hair back. Avoid wearing jewelry while drilling. Cone off the work area to keep general public away from the drilling rig.	
		4	Dust and debris can cause eye injury and soil cuttings and/or water could contain COCs.	Wear safety glasses and stay as far away from actual drilling operation as practicable. Wear appropriate gloves to protect from COCs.	
		5	Drilling equipment laying on the ground (i.e. augers, split spoons, decon equipment, coolers, etc), create a tripping hazard. Water from decon buckets generate mud and cause a slipping hazard.	Keep equipment and trash picked up, and store away from the primary work area.	
		6	The raised derrick can strike overhead utilities, tree limbs or other elevated items	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Clearance H&S Standard for guidance.	

4	Mudd rotary drilling	1	The raised derrick can strike overhead utilities, tree limbs or other elevated items	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	
		2	This technology uses fluid, which collects with sediments in large basin. Fluid can splash out and cause slipping/mud hazard. Liquid mixture can splash into your eyes.	Wear rubber boots if needed, and keep clear of muddy/wet area as much as practicable. If area becomes excessively muddy, consider mud spikes or covering the area with a material that improves traction. Wear safety glasses.	
5	Hollow stem auger drilling	1	All hazards in step 3 apply. Additionally,The raised derrick can strike overhead utilities, tree limbs or other elevated items	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	
		2	Hands or fingers can get caught and crushed if trying to clean by hand or with tools while the auger is still turning.	Auger should always be stopped and clutch disengaged prior to cleaning.	
6	Air Rotary Drilling	1	This drilling method works with high air pressure and can generate flying debris that can strike your body or get in your eyes.	When the drill rig is being driven into media, it will produce flying debris. The flaps behind the drill rig should stay closed whenever possible to reduce the risk of flying debris. Safety glasses and hard hat should always be worn when the drill rig is operating. When penetrating asphalt, protect surrounding cars that may be present to avoid damage to pain or windshields.	
		2	The raise derrick can strike overhead utilities, tree limbs or other elevated items.	Never move this rig with the derrick up. Ensure there is proper clearance to raise the derrick and that you are far enough away from overhead power lines. See the Utility clearance H&S Standard for guidance.	
		3	When drilling through bedrock prior to groundwater, dust can be produced from pulverization. Inhalation of dusts/powder can occur.	Supplemental water should be used to manage dust and/or dust masks should be used if necessary.	
7	Reverse rotary drilling	1	This method will use fresh water to pump out drill cuttings through the center of the casing. Water/sediment mixture is generated and could cause contact with impacted soils or groundwater.	Ensure the pit construction can hold the amount of cuttings that are anticipated. Air monitoring should also be used of pit area.	
		2	Fire hydrants are often used for water source. Hydrants deliver water at high pressure. Pressurized water can cause flying parts/debris and excessive slipping hazards.	Water usage from fire hydrants should be cleared with local municipalities prior to use. Only persons that know how to use the hydrant should be performing this task. Ensure all connections are tight, and hose line is not run over to cut by traffic. Any leaks from the hydrant should be reported immediately.	
		3	Settling pit construction can cause tripping hazard from excavated soils, and plastic sheeting can cause slipping.	Cone off the area to keep the general public/visitors away from the settling pit. Ensure proper sloping of excavation.	
		4	The raised derrick can strike overhead utilities, tree limbs or other elevated items.	Never move the rig with the derrick up. Ensure there is proper clearance to raise the derrick, and that you are far enough away from overhead power lines. See the Utility Location H&S policy and procedure for guidance.	
8	Rotosonic drilling	1	Fire hydrants are often used for water source. Hydrants deliver water at high pressure. Pressurized water can cause flying parts/debris and excessive slipping hazards.	Water usage from fire hydrants should be cleared with local muncipalities prior to use. Only persons that know how to use the hydrant should be performing this task. Ensure all connections are tight, and hose line is not run over to cut by traffic. Any leaks from the hydrant should be reported immediately.	

8	Rotosonic drilling	2	This method requires a lot of clearance. The drill head can turn 90 degrees to attach to the next drill flight or casing. This usually requires a large support truck to park directly behind the rig. As the drill head raises the new casing flight is angled down at the same time until it can be turned completely vertical.	Ensure sufficient overhead clearance.	
		3	Heavy lifting of cores can cause muscle strain.	Always use 2 people to move core containers. Use caution moving core samples to layout area. Plan layout area to ensure adequate aisle space between core runs for logging. Keep back straight and use job rotation.	
		4	The rotosonic drill head can move very quickly up and down while working on a borehole. Moving parts can strike someone or catch body parts.	The operator and helper must communicate and stay clear of the path of the drill head. The drill utilizes two large hydraulic clamps to continuously hold casings while load/unloading previous casings. Do not wear loose clothing.	
9	Direct push drilling	1	The drill rods will be handled by workers most of the time rather than the rig doing it, therefore pinch points can cause lacerations and crushing of fingers/body parts.	Keep a minimum of 5 feet away from drill rig operation and moving parts.	
		2	The direct push rigs are usually meant to fit in spaces where larger rig can't. Tight spaces can pin workers.	Do not put yourself between the rig and a fixed object. Use Spotters or a tape measure to ensure clearances in tight areas. Pre-plan equipment movement from one location to the next.	
		3	Some direct push equipment is controlled by wireless devices. These controls can fail and equipment can strike workers or cause damage to property.	The drill rig should be used in a large open area to test wireless controls prior to moving to boring locations. The operator of the rig will test the kill switch with wireless remote prior to use. Operator will stay in range of rig while moving so that wireless signal will not be too weak and cause errors to the controls.	
		4	Sampling sleeves must be cut to obtain access to soil. Cutting can cause lacerations.	It's preferable to let the driller cut the sleeves open. Many drillers have holders for the sleeve to allow for stability when cutting. If you cut the sleeves, use a hook blade, change blade regularly, and cut away from the body.	
		5	Soil cores may contain contaminated media.	Wear nitrile gloves and saftey glasses for protection from contaminated media when logging soil borings.	
10	Rock coring	1	Flying debris can hit workers or cause debris to get in eyes.	Rock chips or overburden may become airborne from drilling method. Wear safety glasses and hard hat and remain at a safe distance from back of drill rig.	
		2	Heavy lifting of cores can cause muscle strain.	Always use 2 people to move core containers. Use caution moving core samples to layout area. Plan layout area to ensure adequate aisle space between core runs for logging. Keep back straight and use job rotation.	
11	Sample collection and processing	1	Injuries can result from pinch points on sampling equipment, and from breakage of sample containers.	Care should be taken when opening sampling equipment. Look at empty containers before picking them up, and do not over-tighten container caps. Use dividers to store containers in the cooler so they do not break.	Sample Cooler Handling JSA
		2	Lifting heavy coolers can cause back injuries.	Use two people to move heavy coolers. Use proper lifting techniques.	
12	Monitoring well installation and decommissioning	1	Same hazards as in Step 3 with general drill rig operation	See step 3	
		2	Monitoring well construction materials can clutter the work area causing tripping hazards.	Well construction materials should be picked up during the well installation process.	

12	Monitoring well installation	3	Heavy lifting can cause muscle strains, and cutting open bags can cause lacerations.	Well construction materials are usually 50 lbs or greater. Team lift or use drill rig to hoist bags. Always use work gloves while cutting open bags.	
		4	Well pack material (i.e. sand, grout, bentonite) can become airborne and get in your eyes.	Wear safety glasses for protection from airborne sand and dust.	
		5	Cutting the top of the well to size can cause jagged/sharp edges on the top of the well casing.	Wear gloves when working with the top of the well casing, and file any sharp jagged edges that resulted from cutting to size.	
13	Soil cutting and purge water management	1	Moving full drums can cause back injury, or pinching/crushing injury.	Preferably have the drilling contractor move full drums with their equipment. If this is not practicable, use lift assist devices such as drum dollies, lift gates, etc. Employ proper lifting techniques, and perfrom TRACK to identify pinch/crush points. Wear leather work gloves, and clear all walking and work areas of debris prior to moving a drum.	Drum Handling JSA

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs		Required
Miscellaneous PPE	traffic vest--Class II or III		Required
Respiratory Protection	dust mask		Recommended

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Decontamination	Decon supplies (specify type)	Driller to Provide and Manage	Recommended
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
Personal	eye wash (specify type)	bottle	Required
	water/fluid replacement		Recommended
Traffic Control	traffic cones		Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Coppola, Mija HASP Reviewer Approve 2/2/2009	

Job Safety Analysis

General

JSA ID	38	**Status**	(3) Completed
Job Name	General Industry-Surveying - land	**Created Date**	2/2/2009
Task Description	land surveying	**Completed Date**	02/02/2009
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Coppola, Mija	2/4/2009	2/2/2009	Coates, Gary	☑
HASP Reviewer	Coppola, Mija	2/4/2009	2/2/2009	Coates, Gary	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Site reconnaissance and walk-around	1	Slips/trips/falls can occur from walking on uneven ground surface.	Survey the site upon arrival. Note any site conditions that may pose a potential hazard.	JLA-Roadway Work ARCHSFS017
		2	Site workers or equipment can be struck by site vehicular traffic	Wear Class II traffic vest and cone off the work area. Follow the JLA and Field H&S Handbook for roadway work.	
2	Deployment and retrieval of traffic control devices during roadway work	1	Stuck by vehicles	Face traffic and use spotter if not facing traffic, stay off the travelled roadway to extent practical, wear Class II (minimum) traffic vest. Familiarize yourself with work zone control layout prior to deploying devices.	
		2	Slips trips and falls on uneven road or land surfaces	Do not carry objects that obscure visibility of ground surface when walking, wear footgear with ankle support and good tread, use buddy system when carrying large bulky objects.	
		3	Lifting heavy or bulky signage or traffic channeling device	Brake down load to manageable size. Do not over reach to grab cones from the interior of the project vehicle. Use proper lifting techniques, maintain good vehicle housekeeping to easily retrieve control devices. Use buddy system to move heavy objects like barrels.	
		4	Pinch points to hands on folding components of sign stands	Wear leather gloves or other suitable glove. Watch for hazard and avoid placing hands in pinch areas. Do not hurry through setup/take down task.	
3	Sharpen machete, brush axe or other cutting tool	1	Sharpening machete can cause lacerations and can generate metal shavings that can cause eye abrasions.	Secure blade to a sturdy fixture such as work bench and use vice. Make sure that sharp edge does not come in contact with fingers/body when sharpening. Sharpen blade 4"-10" above handle. Tip is not sharpened. Use Kevlar gloves and safety glasses.	
		2	Cuts from unsheathed/uncovered cutting tool upon completion of sharpening activity	Promptly sheath or cover cutting blade of cutting tool upon completion of sharpening task, do not "stick" machetes in ground until needed for use.	
4	Line cutting with machete	1	Improper use of the machete can cause lacerations	Do not reach or over-extend when cutting, and cut away from the body at 45 degree angle. Always keep machete sharpened. Do not use tool if the handle becomes wet/slippery. Never stick the blade into the ground--sheath machete when not in use. See the Field H&S Handbook for detailed machete use instructions (section DD).	Field H&S Handbook Section DD

4	Line cutting with machete	2	Utility lines can be accidentally severed during cutting	Inspect area for location of overhead lines prior to starting the task. Do not use machete when cutting vegetation that is close to utility lines. Use more appropriate tools such as garden clippers or shears.	
		3	Biologicals such as poisonous plants, bees/wasps, and other insects can be encountered during cutting of vegetation or brush.	Attempt to identify biological concerns prior to starting task. Use identification techniques outlined in the Field H&S Handbook.	
		4	Cardio and muscle fatigue can be experience from prolonged use of machete or when using machete for cutting of thick vegetation.	Take proper rest breaks, and rotate work jobs with co-workers. For thick vegetation, make sure the machete is the best tool for the job.	
		5	Impalement hazards from falls onto stumps of cut vegetation	Be aware of hazard and avoid walking in cut areas where vegetation exists that could present an impalement hazard. In areas where longer term work areas are cleared, take time to cut vegetation closer to ground surface without an angular cut.	
		6	Objects can fall once cut, or particles can become airborne getting into eyes or puncturing skin.	Wear hard hat, safety glasses and steel-toe shoes. Determine a safe fall zone. Do not use hard strokes when cutting with the machete to limit flying particles.	
		7	Fallen branches and vegetation can cause tripping hazard	Remove freshly cut limbs and brush from the work area to ensure balance, reduce slips and falls, and reduce obstructions.	
5	Line cutting using brush axe or chainsaw (must be approved by Party Chief).	1	Improper use of the bush axe or chainsaw can cause serious injury	Inspect equipment before use, and keep chain sharp. Hold the chainsaw with both hands, never cut above shoulder height. Keep saw close to your body. Carry brush axes sheathed and blade facing away from body. Do not carry brush axes when carrying other large or bulky objects.	Site clearing JLA
		2	Struck by brush axe	Maintain proper separation distance when cutting, ensure anti-slip tape or other material on handles of brush axe to prevent slipping out of hands , wear gloves with good gripping capability.	
		3	Utility lines can be accidentally severed during cutting	Inspect area for location of overhead lines prior to starting the task. Note direction of fall for trees and ensure contact with utility lines will not occur	
		4	Objects can fall once cut, or particles can become airborne getting into eyes or puncturing skin.	Wear hard hat, safety glasses and steel-toe shoes. Determine a safe fall zone. to limit flying particles.	
		5	Fallen branches and vegetation can cause tripping hazard	Remove freshly cut limbs and brush from the work area to ensure balance, reduce slips and falls, and reduce obstructions.	
		6	Noise hazards (chainsaw)	Wear hearing protection (ear plugs or ear muffs)	
6	Removal of manhole covers	1	Pinch points and scrape hazards when removing MH cover.	Do not place fingers under lid during removal, use shovels, pry bars, etc to place under lid edge to lift. Wear sturdy work glove. Wear steel toe boot, do not purposely drop lids.	
		2	Back/neck/arm/shoulder strains and hand blisters could occur from over lifting, or not lifting properly.	Use proper lifting techniques, keep back straight, lift with legs, use “J” Hook or pry bar, Buddy System required	
7	Equipment set-up, calibration and survey of target area	1	Slips/trips/falls can occur from walking on uneven ground surface.	Watch for uneven ground, debris, and trip hazards. If possible clear area of trip hazards. Wear gloves and heavy denim work pants to avoid cuts when working in heavy brush/briers. Use buddy system to spot for uneven ground while surveying.	

8	Placement of stakes	1	Hands/fingers/arms can get struck by hammer/mallet. Splinters and lacerations can occur if stake splints during hammering.	Wear leather work gloves and safety glasses when placing stakes.	
9	Placement of monuments	1	Back strain from digging holes or mixing concrete	Use proper shoveling techniques and keep back straight, Use right tool for the job.	refer to Concrete work JLA
		2	Exposure to concrete can cause skin irritation or illness	Wear impermeable glove during mixing and concrete placement, promptly wash exposed skin. Do not use bare hands to mix, place, or finish concrete.	
		3	Inhalation of concrete dust during mixing	Keep face away from concrete when poured out of bag, Promptly wet concrete to be mixed.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	work gloves (specify type)	Kevlar for machete use, leather for cutting	Required
Head Protection	hard hat		Required
Miscellaneous PPE	other	chainsaw chaps	Required

Supplies

Type	Supply	Description	Required
Miscellaneous	fire extinguisher		Required
	first aid kit		Required
	Other	snake chaps depending on work location	Recommended
Personal	water/fluid replacement		Required
Traffic Control	traffic cones	for roadway surveying	Required

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Coppola, Mija HASP Reviewer Approve 2/2/2009	

Job Safety Analysis

General

JSA ID	2291	**Status**	(3) Completed
Job Name	Construction-Excavation and trenching	**Created Date**	4/26/2010
Task Description	Soil Excavation	**Completed Date**	04/27/2010
Template	True	**Auto Closed**	False

Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	NO PROJECT MANAGER

User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Moyers, Sam	4/26/2010	4/26/2010	Coppola, Mija	☑
HASP Reviewer	Edwards, Lauren	5/10/2010	4/27/2010	Coppola, Mija	☑

Job Steps

Job Step No.	Job Step Description		Potential Hazard	Critical Action	H&S Reference
1	Site preparation	1	Improper utility clearance may result in utility/equipment damage or injury.	Perform utility clearance with a minimum of 3 lines of evidence. document utility clearance for reference including any ticket numbers or phone numbers of utilities.	
		2	Clearing vegetation may result in impact hazards.	Stand at least 25 ft from clearing operations using manual or mechanized methods. Larger vegetation like trees may be under stress and may break and wood parts my fly in any direction.	
		3	Slip trip and fall hazards from walkover activites (vegetation, uneven surfaces, etc and applies to all job steps in this JLA)	Plan route and focus on the task at hand (walking). Do not walk while looking at utility maps/drawings or talking on cell phones.	
2	Excavation and backfilling	1	Struck by equipment during excavation.	Stay at least 10 feet beyond the reach of excavation equipment unless establishing communication with operator. wear PPE required by this JSA for increased visibility. Keep unneccessary workers away from the excavation area.	
		2	Equipment/worker falls into excavations from edge collapse	Stand at least 6 ft from edge of excavation. Competent person to oversee sloping, benching, bracing excavation to ensure stability.	
		3	Worker entrapment/suffocation/chemical overexposure/engulfment in excavation	Entry into excavations are prohibited unless approved by a Competent Person. Keep spoil piles at least 2 ft from excavation edge. Ensure proper slope/bench/shileding is in place prior to entry. Air monitor for toxic vapors and oxygen deficiency. Ensure proper means of access and egress.	
		4	Chemical exposure to site contaminants.	Wear protective clothing specified in this JSA, avoid skin contact with soil materials or any liquids in the excavation. Use air monitoring to ensure TLVs are not exceeded. Wash hands and face prior to eating, drinking or consuming tobacco.	
		5	Noise from excavation equipment	Keep distance from equipment to reduce noise levels. If levels cannot be controlled wear hearing protection appropriate for the hazard.	
3	Excavation equipment decontamination	1	Slips and falls on wet surfaces.	Wear footwear appropriate for wet environments. Reduce amount of pressure washing required by removing soils using dry methods to extent practical	

3	Excavation equipment decontamination	2	Flying particles from cleaning activities.	Wear eye and skin protection during decontamination activities. Use face shield if overspray or flying debris is a persisitent problem. Avoid cleaning (pressure washing) in direction of other nearby workers, keep uneccessary workers clear of decontamination activity.	

PPE — Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	chemical protective suit (specify type)	Tyvek per SSO	Required
Eye Protection	faceshield	During decontamination (per SSO)	Required
	safety glasses		Required
Foot Protection	rubber boots	Wet environments per SSO	Required
	steel-toe boots		Required
Hand Protection	chemical resistant gloves (specify type)	Nitrile when handling impacted soils	Required
	work gloves (specify type)	leather or equivalent (per SSO)	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs		Required
Miscellaneous PPE	traffic vest--Class II or III	Class II	Required

Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
	walkie talkie	per SSO	Required
Miscellaneous	auxilary lighting	Light plant for night work	Required
	fire extinguisher	ABC 10 pound minimum	Required
	first aid kit		Required
Personal	eye wash (specify type)	Bottle	Required
	insect repellant		Recommended
	sunscreen		Recommended

Review Comments

Reviewer		Comments
Employee: **Role** **Review Type** **Completed Date**	Edwards, Lauren HASP Reviewer Approve 4/27/2010	

Attachment D
Subcontractor
Acknowledgement Form

Memorandum of Acknowledgement

To: ARCADIS
From "Subcontractor": _____
{Insert Subcontractor Name}
Date: _____
Re: Subcontractor Health and Safety Plan

Pursuant to its obligations under the referenced Site and Project, Subcontractor submits the following **as the** Subcontractor's Health and Safety Plan ("HASP") for the following project and client:

Client: Georgia-Pacific, LLC **Site Name:** Willsboro Black Ash Pond Site

Project Name: Willsboro Black Ash Pond **ARCADIS Project Number:** B0066127

Start Date: _____ **End Date:** _____

Subcontractor acknowledges that it is responsible for the health and safety of its workers and others relating to the Subcontractor's Work and Site. The Subcontractor is required to submit its Health and Safety Plan for its Work. To comply with its requirements, the Subcontractor represents that its Health and Safety Plan for its Work shall include the Subcontractor's compliance (including compliance by Subcontractor's employees, officers, agents, representatives, invitees, and sub-subcontractors) with the ARCADIS Health and Safety Plan, together with any further amendments to such plan particular to the Subcontractor's Work and Site deemed necessary and appropriate by the Subcontractor.

Subcontractor agrees and understands that ARCADIS claims no responsibility for the use of the HASP and ARCADIS does not represent that the HASP is sufficient to address the Work or Site conditions of the Subcontractor. Subcontractor shall not hold ARCADIS responsible for any claims arising from the Subcontractor's use of the HASP and agrees to indemnify, defend and hold harmless ARCADIS from any claims for personal injury or property damages arising from or related to the compliance with, utilization or application, or any alleged deficiencies of the HASP. Nothing herein, including the use by Subcontractor of the HASP or acknowledgment of the Subcontractor's HASP shall create any duty, obligation, liability, or responsibility of ARCADIS for any act or failure to act in respect to any safety provision of the HASP and the Subcontractor shall remain solely responsible for the health and safety of Subcontractor, its employees or any person entering the Subcontractor's Work Site.

Signed: _____
{Insert Subcontractor Name}

By: _____
Name: _____
Title: _____
Date: _____

Appendix E

Site-wide Inspection Form

ANNUAL SITE-WIDE INSPECTION CHECKLIST
WILLSBORO BLACK ASH POND SITE

DOCUMENT REVIEW

Conducted By: _____
Representing: _____ Review Start Date: _____

1. ☐ Check here to confirm that the Environmental Easement (EE) has been reviewed.

2. ☐ Check here to confirm that the Plan of Restricted Area (as revised if appropriate) has been reviewed.

3. ☐ Check here to confirm that the description of this property in the Final Engineering Report and the as-built survey drawings covering this property included in the Final Engineering Report (and any alternative plan proposed for the comparison described in Item 8 on next page) have been reviewed.

4. Are there any recorded amendments to or releases from the EE, and/or any known conditional exceptions under the EE and of which the reviewing party has a copy, and/or any other documents in the Owner's possession relevant to the EE or the use of the property?
   ☐ No
   ☐ Yes – If yes, review those items for background information purposes and list them below (along with the book and page reference in the Registry of Deeds where applicable). (Note that the document reviewer has no obligation to verify the accuracy or completeness of any of these documents, either as of the time they were prepared or as compared to the current conditions.)

   _____
   _____
   _____
   _____
   _____

5. Review Completed Date: _____

VISUAL ON-SITE INSPECTION

Conducted By: _____
Representing _____ Inspection Start Date: _____

1. Weather

   _____

2. List other individuals and their company/agency that were present during the visual on-site inspection.

   _____
   _____
   _____

3. Is there any visual evidence of activities and uses of the property since the last inspection that are potentially contrary to the restrictions of the EE?
   ☐ No
   ☐ Yes - If yes, describe below.

   _____
   _____
   _____

4. Is there any visual evidence of utility work or building construction, modification, addition, or demolition at the property since the last inspection?
   ☐ No
   ☐ Yes - If yes, describe below and show the location(s) of such activity on a plan.

   _____
   _____
   _____

5. Is there any visual evidence of soil excavation at the property that generated more than 10 cubic yards of soil since the last inspection?
   ☐ No
   ☐ Yes - If yes, describe below and show the location(s) of such activity on a plan.

   _____
   _____
   _____

ANNUAL SITE-WIDE INSPECTION CHECKLIST
WILLSBORO BLACK ASH POND SITE

6. Is there any visual evidence of significant soil erosion at the property since the last inspection, specifically in the soil cover area and/or the stabilized riverbank area?
   - ☐ No
   - ☐ Yes - If yes, describe below and show the location(s) of such erosion on a plan.

   _____
   _____
   _____

7. Is there any visual evidence of significant pavement construction, disturbance, or excavations at the property since the last inspection?
   - ☐ No
   - ☐ Yes - If yes, describe below and show the location(s) of such activity on a plan.

   _____
   _____
   _____

8. Is there any visual evidence of significant disturbance to the vegetation installed during restoration in the upland Soil Cover Area or the Riverbank Area? Has at least 85% of the installed vegetation survived?
   - ☐ No
   - ☐ Yes - If yes, describe below and show the location(s) of such activity on a plan.

   _____
   _____
   _____

9. Do invasive species account for more than a total of 5% of the restored area?
   - ☐ No
   - ☐ Yes - If yes, describe below and show the location(s) of such activity on a plan.

   _____
   _____
   _____

10. Is there any visual evidence of significant disturbance to or movement of the riprap installed to stabilize the Riverbank
    - ☐ No
    - ☐ Yes - If yes, describe below and show the location(s) of such activity on a plan.

    _____
    _____
    _____

11. Is there any visual evidence of significant bare spot(s) in the Undisturbed Area?
    - ☐ No
    - ☐ Yes - If yes, describe below and show the location(s) of such activity on a plan.

    _____
    _____
    _____

12. If any of the conditions listed in the response to Questions 4 through 11 appears likely to have significantly altered the surface grade of the property compared to the surface grade shown on the as-built drawings included in the Final Engineering Report (or an alternative, more recent plan proposed by the Owner), identify the approximate area/location(s) of such grade change on a plan and compare the new surface grade in such area(s) to the surface grade shown on the above listed drawing and/or plan. (If the Owner proposes use of an alternative plan for this comparison, include a copy of that plan and describe the rationale for its proposed use.)

13. Inspection Completed: _____

**If necessary, attached additional pages for descriptions of any items observed related to the above questions.

Appendix F

Stormwater Pollution Prevention Plan

ARCADIS

Infrastructure · Water · Environment · Buildings

Georgia-Pacific LLC

Storm Water Pollution Prevention Plan

Willsboro Black Ash Pond Site
Willsboro, New York

August 2012

Storm Water Pollution Prevention Plan

Willsboro Black Ash Pond Site
Willsboro, New York

Prepared for:
Georgia-Pacific LLC

Prepared by:
ARCADIS of New York, Inc.
6723 Towpath Road
P.O. Box 66
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.449.0017

Our Ref.:
B0066127

Date:
August 2012

ARCADIS

Table of Contents

1. Introduction

1.1 General

Georgia-Pacific LLC (Georgia-Pacific) and ARCADIS prepared this Storm Water Pollution Prevention Plan (SWPPP) to support the implementation of the remedial action for the Willsboro Black Ash Pond site located in Willsboro, New York (the Site). During the remedial action, storm water management practices will be implemented to 1) control potential impacts (i.e., erosion and sediment loading) to Site-related storm water runoff; and 2) achieve the following objectives:

- Minimize potential erosion of existing soil/sediments within active work areas.
- Minimize the potential for the conveyance of sediment-laden storm water beyond the project work limits.
- Minimize accumulation of water within active work areas.

1.2 Site Description

The Site encompasses approximately 25 acres at the terminus of School Street in the Town of Willsboro, Essex County, New York, approximately two miles west of Lake Champlain. The Site is bounded to the north and west by the Boquet River, to the east by lands owned by the Adirondack Nature Conservancy (ANC), and to the south by additional lands owned by the ANC and Town. The Town of Willsboro Wastewater Treatment Plant occupies a contiguous 2.7 acre parcel along the southern border. The undeveloped Site lies at an elevation of approximately 50 feet above mean sea level, and the surface is relatively flat with the topography slightly climbing to the south and west.

1.3 Overview of Remedial Action

The remedial action includes the following design components approved by the New York State Department of Environmental Conservation (NYSDEC):

- Site mobilization/preparation.
- Clearing of trees and vegetation that interfere with the stream bank stabilization work, as needed (mature trees and vegetation that are found to be stable may be retained).

- Consolidation of black ash waste, excluding certain sections of the riverbank without significant river erosive forces, and movement of the black ash waste away from the river.

- Grading of the Site to mitigate the infiltration of water by diverting storm water flow around the waste mass and reducing the potential for ponding on the waste mass.

- Construction of the stream bank stabilization features along a portion of the riverbank (i.e., given existing conditions and forces on several segments of well-vegetated riverbank, only armoring with riprap at the toe of the slope may be required at those locations), and reinforcing the riverbank with riprap underlain with a geotextile fabric.

- Construction of a soil cover for consolidated black ash that is graded to provide proper storm water control, drainage, and enhance recreational opportunities. Once constructed, the soil cover area will be revegetated or otherwise stabilized.

- Construction of an inlet/outfall structure to connect the site's low lying area as floodplain to the Boquet River.

Additional details related to each of these components of the selected remedy are discussed in the Remedial Action Work Plan (RAWP) to which this SWPPP is an appendix.

2. Erosion and Sediment Control Plan

2.1 General

The Contractor will be responsible for installing and maintaining erosion and sediment control measures required during the remedial action. Erosion and sediment controls will be installed and maintained in accordance with the *New York Standards and Specifications for Erosion and Sediment Control* (NYSDEC 2005; NYS Standards and Specifications), unless otherwise noted. Erosion and sediment control measures will be installed prior to initiating any intrusive activities as site preparation activities allow. The Contractor will also be responsible for providing additional erosion and sediment control measures during construction (as needed) to achieve the storm water management objectives of this SWPPP.

2.2 Erosion and Sediment Control Measures

The erosion and sediment control measures anticipated to be used during the remedial action include the following:

- Temporary Seeding: Temporary seeding will be applied to provide a temporary protective cover in disturbed areas when construction activities have temporarily ceased (as deemed necessary by the Owner and/or Engineer) or to provide cover when permanent seeding is likely to fail due to mid-summer heat and drought. Temporary seeding will be performed in accordance with the requirements of Materials and Performance (M&P) – Section 02210 (Topsoil and Seeding).

- Material Staging Areas: Material staging areas will be used to reduce the potential for migration of stockpiled materials (via storm water runoff) to adjacent areas. Materials will be staged in these areas will be covered with polyethylene tarps whenever the materials are not actively being placed in accordance with the Construction Drawings and M&P – Section 02201 (Earthwork). Refer to the Construction Drawings for the anticipated locations and details for material staging areas.

- Equipment/Personnel Cleaning Areas: These areas will be used for the cleaning of personnel and equipment prior to leaving the Site in accordance with the procedures outlined in the RAWP. Refer to the Construction Drawings for the anticipated locations and details of cleaning areas.

- Silt Fencing/Hay Bale Dikes: Silt fencing and/or hay bale dikes will be used to reduce the potential for migration of suspended sediments beyond the project work limits.

Refer to the Construction Drawings for the anticipated minimum locations and details of silt fencing. Hay bale dikes may be installed in lieu of or in addition to silt fencing. Silt fencing and hay bale dikes will be installed in accordance with the Construction Drawings and M&P – Section 01110 (Environmental Protection Procedures).

- Turbidity Controls: Water-based sedimentation (resuspension) controls will be utilized during the performance of excavation activities in or near the river. These controls include operational and equipment controls and use of diversion barriers (e.g., Jersey barriers and water stilling techniques. Turbidity controls will be installed immediately upstream of active work areas, visually inspected on a daily basis, and maintained throughout the construction period. Turbidity monitoring will be performed. Additionally, turbidity curtains or silt fence may be used to provide additional turbidity control in the event that the water stilling techniques are not found to sufficiently control the effects of construction on the turbidity levels in the Boquet River. If monitoring results indicate that stilling techniques are not sufficiently controlling the effects of construction on the turbidity levels in the Boquet River, additional turbidity control measures, such as use of turbidity curtains or silt fence, will be implemented. The Contractor will be responsible to meet turbidity performance standards defined in the RAWP. Details regarding installation of the turbidity controls are included on the Construction Drawing.

- Dust Controls: Dust control measures will be implemented to reduce the potential for the dust generation. The Contractor will be responsible for implementing appropriate dust control measures in accordance with the RAWP and M&P – Section 01110.

- Good Housekeeping Practices: Good housekeeping practices will be implemented to reduce the potential for construction materials becoming entrained in storm water discharges from the Site. Throughout construction, the Contractor will be responsible for maintaining the Site in a neat and orderly condition. This will include routine waste management activities (e.g., the collection and disposal of trash, rubbish, construction waste, and sanitary wastes); prompt cleanup of spills liquid or dry; and prompt cleanup of materials tracked by construction vehicles.

Refer to the Construction Drawings and Technical Specifications for additional information regarding material and installation requirements for the erosion and sediment control measures identified above.

2.3 Inspection and Maintenance of Erosion and Sediment Control Measures

Inspections of erosion and sediment controls will be performed to confirm that the erosion and sediment control plan is being implemented properly and remains functional relative to Site conditions. The Contractor will be responsible for maintaining erosion and sediment controls in accordance with the NYS Standards and Specifications and to the satisfaction of the Owner/Engineer and NYSDEC. The Contractor is also responsible for inspecting erosion and sediment controls at least once every seven calendar days per M&P – Section 02260. The Contractor will prepare an inspection report that summarizes the results of the weekly inspections. The minimum requirements for inspection reports are set forth in M&P – Section 01110.

Maintenance of existing erosion and sediment controls and/or required installation of additional controls, as determined during inspections, will be initiated within 48 hours following the inspection and completed prior to the next scheduled inspection. If Site conditions (e.g., weather, ground conditions) prevent maintenance/installation activities from being completed prior to the next inspection, such conditions will be noted in the subsequent inspection report and maintenance/installation activities will be completed as soon as Site conditions permit. Erosion and sediment control measures will be maintained for the duration of the remedial action until such time that the Site has been stabilized (i.e., soil-disturbing activities at the Site have been completed, and a uniform vegetative cover has been established or equivalent stabilization measures, such as the use of mulches, woodchips, geotextiles, or stone cover have been employed per M&P – Section 02260).

2.4 Site Restoration

Disturbed areas will be restored in accordance with the Construction Drawings and Technical Specifications. A final Site inspection will be performed by the Engineer to verify that disturbed areas are stabilized with the prescribed soil cover, woodchips, or stone. If inadequacies are found during the inspection, measures will be implemented to correct inadequate areas and another final Site inspection will be performed by the Engineer. Following acceptance of final site stabilization, the Contractor will remove temporary erosion and sediment control features that are no longer needed (e.g., silt fencing, hay bale dikes, etc.).

2.5 Construction Sequence

Refer to the Construction Drawings for additional information regarding construction sequencing.

3. Pollution Prevention Plan

3.1 General

The Contractor will be required to prepare and implement a Pollution Prevention Plan (as part of the Contractor's Contingency Plan) for the Site in accordance with the minimum requirements listed below. In general, the Contractor's Pollution Prevention Plan will outline measures to prevent spills from occurring (a Spill Prevention Plan) and measures to be implemented in the event of a spill or spill-related emergency (a Spill Response Plan). Each of these components is briefly described below.

3.2 Spill Prevention Plan

Prior to mobilization, each piece of equipment to be brought onsite will be visually inspected by the Contractor for potential sources of spills of hydraulic fluid, engine oil, transmission fluid, fuel, grease, etc. (by inspecting the condition of hydraulic cylinders, hoses, gaskets, fuel tanks, etc.). If a potential spill source is identified, the Contractor will conduct the necessary repairs or replace the piece of equipment prior to mobilizing such equipment to the Site.

The Contractor will take the following precautions to minimize potential spills of fuel during the implementation of the remedial action:

- Conduct refueling activities on level ground within a designated area away from steep slopes.
- Place on-site fuel storage tanks in containment areas.
- Do not leave equipment unattended during refueling.
- Do not re-fill internal combustion engine fuel tanks with a flammable liquid while the engine is running.
- Replace fuel caps before starting the engine.
- Secure (i.e., lock) fuel pump dispensers when not in use to avoid accidental fuel release.

- Conduct visual inspections of equipment/portable fuel tanks to check for leaks. If leaks are observed, transfer the tank contents to an alternate tank and replace or repair the leaking tank, as appropriate.

- Maintain equipment in accordance with the manufacturer's specifications.

- Operate vehicles and equipment safely, and park them a safe distance away from site hazards and sensitive resources, to the extent practicable.

- Locate and operate diesel-powered bypass pumps within a fully-lined containment area (constructed in accordance with the Remedial Design).

3.3 Spill Response Plan

The Contractor will be responsible for implementing appropriate spill response procedures when responding to unplanned releases of oil, products, or other materials to soil, surface water, or sediment during the project. The Contractor will be responsible for immediately reporting all spills to the Owner and Engineer and maintaining an emergency contact list with phone numbers for the following personnel at the Site throughout the implementation of the remedial action: the Willsboro Fire Department; ambulance service; local, county, and state police; and local hospital. The Contractor shall identify responsible personnel who will be in a position at all times to receive incoming phone calls and to dispatch Contractor personnel and equipment in the event of an emergency situation. The Contractor will also maintain a spill kit at the Site throughout the remedial action that includes solid booms (harbor booms), sorbents, absorbent booms, and fire extinguishers.

The Contractor will be responsible for implementing the following spill response procedures:

- Ceasing Operation of the Affected Equipment: This will consist of shutting off the equipment and/or closing any valves and stopping the leak, if possible.

- Containing the Spill: If the spilled material is floating on a water surface, spill-absorbent pads/booms will be placed across the path of the floating spill. If the spilled material sinks below the water surface, a dam, weir, or other containment method will be used to stop the flow of the spilled material. If the spill occurs on land, a containment unit will be constructed to stop the flow of the spilled material. Absorbent material will be applied as necessary.

- Cleaning Up the Spill: Spills in water will be recovered using pumps, sorbent material, etc. as necessary until the spilled material is recovered (and no sheen or other

evidence related to the spill is observed on the water surface). Spills on land will be recovered using pumps, sorbent material, and heavy equipment, as necessary until the spilled material is recovered. Other activities to be conducted during spill cleanup activities include: removing impacted soil/sorbent pads; and using rags and cleaning solution to remove excess spilled material from equipment.

- Containerizing Spill Materials: Spill materials, impacted soil, sorbent pads, etc. will be containerized in New York State Department of Transportation (NYSDOT)-approved containers. The containers will be labeled with the waste type and date of accumulation in accordance with applicable regulations. Samples will be collected to characterize the spilled materials for disposal.

- Disposing of Spill Materials: Impacted materials and spill cleanup debris will be disposed of at a facility permitted to accept the materials. The Contractor will be responsible for coordinating and documenting the disposal activities.

- Performing Post-Spill Maintenance: Following cleanup of the spill, the Contractor will verify and document that all used spill cleanup material and equipment have been disposed of or decontaminated, as appropriate. If the equipment that caused the spill cannot be properly repaired, replacement equipment will be obtained.

4. References

NYSDEC. 2005. New York Standards and Specifications for Erosion and Sediment Control. August 2005. Available at: http://www.dec.ny.gov/docs/water_pdf/bluebook.pdf