Herrick Hollow Creek

Final Remedial Action (RA) Report

Remedial Action for Herrick Hollow Creek Restoration

March 2009

Barton & Loguidice, P.C.

Engineers • Environmental Scientists • Planners • Landscape Architects

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March 2009

Prepared For:

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1.0 Introduction

1.1 Purpose

This Remedial Action (RA) Report describes construction activities for the Remedial Action for Herrick Hollow Creek Restoration. This work is a component of the Remedial Action for the Richardson Hill Road Landfill (RHRL) Site, United States Environmental Protection Agency (USEPA) Site #NYD980507735. The Remedial Action for Herrick Hollow Creek Restoration includes construction of the restored Herrick Hollow Creek channel, restoration of adjacent wetlands and those adjacent to South Pond, and associated operation and maintenance activities. This report has been prepared pursuant to the requirements of the Consent Decree entered into by AlliedSignal, Inc., a predecessor company of Honeywell International, Inc. (Honeywell) and Amphenol Corporation (Amphenol), effective February 16, 1999 (USEPA, 1999), and Section X.I.C. of the Statement of Work. The guidance document "Closeout Procedures for National Priorities List Sites" (USEPA, 2000) provided guidance in preparing this RA Report. Various elements of this RA Report regarding site background, site operations history, excavation and removal of sediments, and project chronology are derived from the "Final Remedial Action Report, Remedial Work Element I - Remedial Excavations and Capping Richardson Hill Road Landfill Site" prepared by Parsons (2007) and approved by the USEPA on September 12, 2007. For the Remedial Action for Herrick Hollow Creek Restoration, construction activities were mobilized on July 1, 2008 and completed the week of September 22, 2008. A final inspection was conducted on September 26, 2008, and as-built survey work was completed in October 2008.

All preliminary data collection, reporting, and restoration design efforts were documented utilizing the existing stationing system established during the

previous stream restoration effort. All stationing referred to in this report reflects the as-built stationing based upon the constructed stream channel centerline.

1.2 Project Team

This section provides a summary of the stakeholder parties directly involved and their roles. Contact information for each party is provided in Table 1.

1.2.1 Agencies

USEPA

The USEPA was the lead agency for the RHRL Remedial Action, including the Remedial Action for Herrick Hollow Creek Restoration. Young Chang was the USEPA project manager, and served as the point of contact for the agencies.

NYSDEC

Gerard Burke, P.E. and Corbin Gosier represented the New York State Department of Environmental Conservation (NYSDEC) and conducted design review and periodic site inspections.

NYCDEP

The New York City Department of Environmental Protection (NYCDEP) was involved with the project because the RHRL is located within the Delaware Watershed System, which is part of the New York City water supply system. Sarah Miller and Joe Damrath

represented NYCDEP and conducted design review and periodic site inspections. Chuck Malinowski also represented NYCDEP, and conducted periodic site inspections during installation of STIMs in 2005 and 2006. James Watkins conducted a site inspection in 2008 during final construction.

1.2.2 Amphenol/Honeywell

Amphenol and Honeywell were ultimately responsible for completing the Remedial Action in accordance with the Consent Decree. Joseph Bianchi (Project Coordinator pursuant to Section XII of the Consent Decree) and Samuel Waldo represented Amphenol. Richard Galloway represented Honeywell. As described below, Amphenol and Honeywell procured the remedial action contractors (DA Collins) and the Engineer (Barton & Loguidice, P.C.) for the Remedial Action for Herrick Hollow Creek Restoration.

1.2.2.1 DA Collins Environmental

DA Collins Environmental (DA Collins) completed all construction components of the Remedial Action for Herrick Hollow Creek Restoration. Dave MacDougall was DA Collins Project Manager and Steve Bullock was Site Superintendent.

1.2.2.2 JTM Associates

JTM Associates is conducting ongoing groundwater investigations at the site associated with previous remediation work covered under Remedial Work Element I - Remedial Excavations and Capping Richardson Hill Road Landfill Site. JTM Associates has also operated in a liaison role between activities conducted under Remedial Work Element I and the Remedial Action for Herrick Hollow Creek Restoration. James T. Mickam was Program Manager for JTM Associates.

1.2.2.3 Barton & Loguidice

Barton & Loguidice provided full-time on-site construction oversight during the construction of the Remedial Action for Herrick Hollow Creek Restoration. Specific activities conducted by Barton & Loguidice included conducting daily inspections of construction activities, documenting of work activities, providing engineering support for design and field changes, quality assurance of construction activities, coordinating reviews of submittals and work plans with the agencies, development of a Stormwater Pollution Prevention Plan, and coordinating periodic project meetings. Barton & Loguidice also subcontracted the services of Bioengineering Group, Inc. for inspection of the constructed stream channel in conjunction with their efforts in providing support for the stream channel restoration design. On-site representatives of Barton & Loguidice included: Todd Phillips, Shaun McAdams, and James Saxton. Bioengineering Group was represented by Doug

Smith. Project Manager for Barton & Loguidice was John Condino. Project principal for Barton & Loguidice was Scott Nostrand.

1.3 Report Basis

This report is based on the results of the implementation of the Herrick Hollow Creek Restoration Design as approved by the USEPA on June 10, 2008. Portions of the report regarding site history and operations frequently reference the Final Remedial Action Report, Remedial Work Element I- Remedial Excavations and Capping Richardson Hill Road Landfill Site, prepared by Parsons (2007).

1.4 Report Organization

This report is organized as follows:

- Section 1 provides an introduction to the project and presents the project team.
- Section 2 provides site background information, including site history, and a summary of the remedial design.
- Section 3 describes construction activities for the Remedial Action for Herrick Hollow Creek Restoration.
- Section 4 presents a chronology of events.
- Section 5 presents a summary of performance standards and construction quality control.

- Section 6 presents supplemental information, including a summary of health and safety during construction, and site-specific observations and lessons learned.
- Section 7 presents a summary of operation and maintenance activities.
- Section 8 presents a summary of final inspections and certifications.

Supporting the text are the following appendices:

Appendix A: Record Drawings
Appendix B: Photographs
Appendix C: Daily Field Reports
Appendix D: Supplemental As-built Data

Table 1
Contact Information

Company	Contact	Phone
Amphenol Corporation	Joseph Bianchi Amphenol Corporation Manager, Environmental 40-60 Delaware Avenue Sidney, NY 13838-1395	607.563.5011
	Samuel Waldo Amphenol Corporation Director of EH&S and Support Services World Headquarters 358 Hall Avenue Wallingford, CT 06492	203.265.8900
DA Collins	Dave MacDougall DA Collins 101 Route 67 Mechanicville, NY 12118-0190	518.664.9855

Table 1 Contact Information		
Company	**Contact**	**Phone**
Honeywell	Richard Galloway, P.E. Honeywell 101 Columbia Road, MEY-3 Morristown, NJ 07962	973.455.2000
New York City Department of Environmental Protection	Joe Damrath NYSDEP Bureau of Water Supply, Quality & Protection 71 Smith Avenue Kingston, NY 12401	845.340.7634
New York State Department of Environmental Conservation	Gerard Burke DEC Division of Environmental Remediation 625 Broadway, 12th Floor Albany, NY 12233-7013	518.402.9814
Barton & Loguidice, P.C.	John Condino Senior Project Manager Barton & Loguidice, P.C. 290 Elwood Davis Road Box 3107 Syracuse, NY 13220	315.457.5200
Bioengineering Group, Inc.	Doug Smith Ecology Branch Coordinator Bioengineering Group, Inc. 18 Commercial Street Salem, MA 01970	978.740.0096
JTM Associates	James T. Mickam, P.G. JTM Associates 290 Elwood Davis Road Liverpool, NY 13088	315.641.1216
United States Environmental Protection Agency, Region II	Young Chang U.S. Environmental Protection Agency, Region II CNY Remediation Section, NY Branch Emergency and Remedial Response Division 290 Broadway, 20th Floor New York, NY 10007-1866	212.637.4253

2.0 Background

2.1 Site Location and Description

The RHRL site is located in the Towns of Sidney and Masonville, Delaware County, New York. The site is located in a rural residential area on Richardson Hill Road, approximately 2.5 miles southeast of Sidney Center.

Information regarding the site can be found at the following website: www.epa.gov/region02/cleanup/sites/nytoc_sitename.htm.

The RHRL site consists of the South Area and the North Area. Within the South Area is the main landfill, which is approximately 8 acres in size and is situated along a hillside above a marsh and the South Pond. The landfill was used primarily for the disposal of municipal refuse. Located within the landfill was a former pit, approximately 25 ft wide by 105 ft long by 14 ft deep, which was used for the disposal of waste oil. Some of the disposed oils contained volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs). Surface water and groundwater from the landfill and adjacent hillside drain towards the marsh and South Pond. Water from the South Pond drains into Herrick Hollow Creek (HHC), which eventually flows into Trout Creek and ultimately into the Cannonsville Reservoir on the West Branch of the Delaware River. Cannonsville Reservoir is part of the Delaware Watershed System, supplying water to the New York City metropolitan area (USEPA, 1997).

As described above, South Pond and the adjacent wetlands to the west, north, and east comprise the extreme headwaters of Herrick Hollow Creek, which originates at the outlet of South Pond. The Herrick Hollow Creek channel extends approximately 4500 feet from its origin downstream in a southerly

direction to a culvert passing under Richardson Hill Road. Beyond this culvert, the stream continues for approximately 3 miles before joining Trout Creek near the village of Trout Creek, NY.

Activities associated with the Remedial Action for Herrick Hollow Creek Restoration encompassed the Herrick Hollow Creek channel, and wetland and upland areas adjacent to the stream and South Pond, extending from the wetland area north of South Pond to a point approximately 200 feet upstream of the culvert under Richardson Hill Road.

2.1.1 Topography

As part of the Catskill Range, the general area is characterized by high relief. The ridge topography is strongly influenced by the bedrock lithology and structure. Valleys are comprised of significant amounts of glacial till. The landscape in the vicinity of the project area can be described as a series of rolling, high elevation hills and low-lying valleys, generally oriented north to south. The ridges marking the eastern and western limits of the Herrick Hollow Creek watershed reach nearly 2,150 feet above sea level. Between these ridges, elevations along the stream corridor range from 1,739 to 1,644 feet above sea level. The bowl-shaped drainage basin (Rosgen Type II-Type V) is common to regions affected by glacial activity, and these basins are often seen throughout the region.

2.1.2 Climate and Precipitation

National Weather Service precipitation data for the Binghamton, NY airport (located approximately 35 miles west) shows average monthly precipitation ranging from a high of 3.73 inches in June to a low of 2.45

inches in January. Average annual precipitation (1961-1990) at the project site is approximately 42 inches, much of it falling as snow during the winter months (Thaler, 1996). The climate is temperate with average daily temperatures ranging from 69.2 degrees Fahrenheit in July to 22.0 degrees in January.

2.1.3 Geology and Soils

This portion of Delaware County is part of the Allegheny Plateau, the northernmost of the Appalachian plateaus, and is located within New York State Hydrologic Region 5 (Miller and Davis, 2003). The northern edge of the Allegheny Plateau forms the Catskills Mountains and the north-south drainage patterns in this area were formed and broadened by runoff from glacial melting (Rogers, et al., 1990). Higher ridges are dominated by Devonian bedrock, whereas much of the low-lying valleys and stream basins are comprised mainly of glacial till deposited during the retreat of the Wisconsin Glacier approximately 14,000 years ago. The character of these late-Pleistocene materials is reflected in the local parent soils.

Historically, the project area has been part of an extensively wooded forest. Wooded vegetation can be observed in the uplands adjacent to the flood plains of the creek. Regionally, the area consists of a dissected upland; relatively steep hills separated by narrow stream valleys that trend primarily from north to south. The upland is developed in bedrock of the Walton Formation, which consists of well imbedded shale, sandstone, and conglomerate. Southern New York State was heavily glaciated during Pleistocene time; consequently, bedrock in the region is overlain by varying thicknesses of unconsolidated glacial deposits,

including basal till, kames, eskers, kame terraces, and outwash material. Clastic material in the deposits ranges in size from silt and fine-grained sand to cobbles and boulders. Given the distribution of grain sizes in the glacial deposits, it seems likely that weathering and erosion of the local bedrock provided much of the material subsequently incorporated into the glacial deposits. The stream banks and floodplains support palustrine emergent wetlands, scrub-shrub habitat, wet meadows, and hardwood forest and forest wetlands along various reaches of the stream.

NRCS Soil Survey data of the study area obtained in May, 1997 indicates the following native (pre-remediation) soil types:

- OnA (Ontusia Channery Silt Loam; 0-3% slopes),
- OnC (Ontusia Channery Silt Loam; 8-15% slopes) and
- VoB (Volusia Channery Silt Loam; 3-8% slopes).

The native soils of the area are very poorly drained. The basin is comprised of soils in hydrological group "C". Existing soils within the portions of the project area previously excavated as part of Remedial Work Element I consist of unclassified soil from the groundwater extraction trench work platform and imported topsoil. Existing soils consist of native parent sub-soils underlying imported fill material and topsoil of varying thicknesses.

2.1.4 Watershed Characteristics

The project portion of the Herrick Hollow Creek watershed is found within a Type II – Type V valley (Rosgen, 1996). Basin relief ranges from 2150 feet on the surrounding ridges to 1644 feet at the lower end of the

study channel reach. The drainage area of the project reach is approximately 608 acres (.95 square miles). Major drainage features in the basin include South Pond and the Herrick Hollow Creek channel. Prior to restoration, large portions of runoff within the watershed reached the pond and/or stream as channelized flow. Through the middle and lower reaches of the project area, roadway drainage along Richardson Hill Road entered the system through road culverts and drainage ditches dug adjacent to the construction access road. These ditches also collected and channelized a large amount of overland and sub-surface flow from the western half of the drainage basin. At three points along the middle and lower reaches of the channel, these ditches drained across the access road and enter the channel. These discharges increased channel turbidity during storm events through erosion of sediment within the ditch, erosion of material from the access road, and gully erosion between the access road and stream channel. Drainage from the surrounding basin to the stream was also effected through a series of rock-lined drainage ditches that collected runoff from the landfill, a discharge from the water treatment plant in the upper wetlands above South Pond, and significant wetlands both around South Pond and adjacent to the middle and lower segments of the study channel reach. From 2004 to the end of 2006, the landfill adjacent to South Pond was in the process of being capped and as a result had a significant effect on both the quantity and quality of surface water flow entering Herrick Hollow Creek. Capping of this landfill was completed in 2006.

Groundwater infiltration/discharge and adjacent wetlands are both substantial contributors to the water budget of Herrick Hollow Creek through the project area. Groundwater at the site exists in the overburden, shallow bedrock (18 to 70 ft), and the deeper bedrock

(greater than 70 ft). The overburden and shallow bedrock flow regimes appear to be hydraulically connected and isolated from the deeper bedrock groundwater flow system. Groundwater in the overburden and shallow bedrock flows towards the center of the valley and generally follows the site topography (Parsons, 2007).

Existing cover types in the project area consisted of secondary brush-shrub and emergent wetlands communities in the immediate stream corridor and beech-birch-maple forest on the lower basin slopes. Some limited areas of mixed forest are present adjacent to Segment III. Vegetation on the upper ridges consists mostly of white pine, hemlock, oak, and maple species. Historically, widespread beaver activity in the watershed led to the formation and maintenance of several beaver dams and ponds, especially in the lower portion of the study reach. These dams played an important role in the development of the adjacent wetland communities and maintenance of the water table through the project area.

2.2 Site History

The land on which the main landfill is located was purchased by Mr. Devere Rosa, Jr. in 1964 for the purpose of operating a refuse disposal area. Devere Rosa, Sr. received a permit from the New York State Department of Health (NYSDOH) in June 1964 to operate the landfill. The landfill was operated from approximately July 1964 until October 1968. In October 1968, Mr. Rosa Sr. signed an order issued against him by the NYSDOH to close the landfill (USEPA, 1997).

Waste materials deposited in the landfill consisted primarily of municipal refuse from the Town of Sidney. In addition to municipal waste, spent oils from

the Scintilla Division of the Bendix Corporation, a predecessor to Honeywell and Amphenol, were disposed in the landfill from approximately July 1964 until July 1966. The spent oils were reportedly disposed as free liquids in the waste oil disposal pit.

Based on the results of a USEPA site investigation and a New York State Department of Environmental Conservation (NYSDEC) Phase II investigation, the RHRL site was listed on the National Priorities List (NPL) on July 1, 1987. On July 22, 1987, Amphenol and Honeywell entered into an Administrative Order on Consent (AOC), Index Number II CERCLA-70205, with the USEPA to perform a remedial investigation and feasibility study (RI/FS) at the site. On September 30, 1993 USEPA issued an AOC, Index Number II CERCLA-93-0214, and a Unilateral Administrative Order (UAO), Index Number II CERCLA-93-0217, to Amphenol and Honeywell in response to a reported fish kill in the South Pond. The work performed pursuant to these orders included excavation of approximately 2,200 cubic yards (cy) of sediment from the South Pond, installation of seep interceptor collection basins upgradient of the South Pond, installation of a sediment trap weir system at the outlet of the South Pond, and installation and maintenance of two whole-house supply water treatment systems (USEPA, 1997).

Upon completion of the RI/FS, a Record of Decision (ROD) documenting selection of a remedial action for the site by USEPA was signed on September 30, 1997. On February 16, 1999, a Consent Decree between USEPA, Honeywell and Amphenol was lodged with the United States District Court. The Consent Decree (USEPA, 1999) required Honeywell and Amphenol to implement the Remedial Action (RA) specified in the ROD for the RHRL.

A Remedial Design Work Plan (RDWP) for the RHRL was submitted to and approved by USEPA (Parsons Engineering Science, Inc. (Parsons), August 1999). The RDWP included a Pre-Design Investigation and the Remedial Design. The pre-design investigation was conducted between October 1999 and January 2000 to supplement information presented in previous reports and to refine the basis of the Remedial Design. A description of the activities and findings from the pre-design investigation was presented in the Pre-Design Investigation Report (Parsons, 2000).

The Final (100%) Remedial Design Report (Parsons, 2002) was submitted to USEPA on August 22, 2002. USEPA approved the portion of the Remedial Design pertaining to the GWTP on August 26, 2002. On October 14, 2002, revised drawings were issued by Parsons reflecting the relocation of the GWTP from the South Area to the North Area. On May 7, 2003, USEPA approved the Remedial Design (i.e., portions other than the GWTP), including those portions associated with Remedial Work Element I.

As a component of Remedial Work Element I, contaminated sediments and soil were excavated from the Herrick Hollow Creek channel and floodplain between June 23, 2004 and October 14, 2004. The "Final Remedial Action Report, Remedial Work Element I- Remedial Excavations and Capping Richardson Hill Road Landfill Site" prepared by Parsons (2007), includes detailed descriptions of the efforts undertaken regarding the excavation and removal of soils and sediments from the vicinity of South Pond and Herrick Hollow Creek, the offsite disposal of certain soils, the consolidation of certain soils and sediments in a TSCA cell constructed at the location of the former landfill, the consolidation of remaining soils and sediments beneath a cap constructed over the former landfill, and associated operations and maintenance activities. Information specific to the areas affected under the Remedial Action for Herrick

Hollow Creek Restoration can be found in Section 3.5 (pages 3-11 thru 3-15) of that report.

The excavated areas along Herrick Hollow Creek corridor were backfilled using unclassified soil from approved off-site sources and imported topsoil. The topsoil was seeded with a wetland seed mix and then covered with a biodegradable erosion control blanket in areas immediately adjacent to the creek.

A sand and gravel habitat substrate was placed in the Herrick Hollow Creek channel. Clusters of live black willow, alder, and cottonwood whips were installed in several areas along the creek alignment in November and December 2004.

Shortly after completion of the backfilling activity, the passing of Tropical Storm Ivan in late September 2004 resulted in severe degrading of the Herrick Hollow Creek channel. Another storm event in April 2005 further impaired channel morphology and function. Subsequent to the damages incurred in September 2004 and April 2005, Barton & Loguidice and Bioengineering Group formulated a Field Investigation Work Plan (FIWP) (Barton & Loguidice, 2005) which was implemented in August 2005. The plan called for the installation of Short-Term Interim Measures (STIMs) along those portions of the channel most significantly damaged, and outlined the data collection efforts required to design a restored stream channel which would maintain stable morphology under typical conditions.

The purpose of these STIMs was to provide short-term tenable grade control through those sections of the channel where the storm had caused severe bed and bank degradation and erosion. The steep middle segment of the channel was most severely impacted, and as such, fifteen short-term grade

control structures were installed through this segment in September 2005. The most severely failing stream banks were matted and disturbed areas adjacent to the channel were re-seeded. In the short-term, these measures worked well in stabilizing the most severely disturbed areas, maintaining grade control and preventing the upstream migration of headcuts that had previously formed. However, the deterioration of these intended short-term structures, aggrading of sediment upstream of these structures, and the high flows associated with the storm event of June 2006 caused many of these structures to be breached, further impairing the channel. In September 2006, these structures were repaired or replaced, many of them with temporary rock structures. The structures were placed so as to establish a channel pattern and profile compatible with that anticipated for the final design. Random boulders were placed in the channel to help provide minor grade control, increase channel roughness, and provide in-stream habitat. Several sections of the stream bank were re-graded to increase connectivity to the floodplain, and were re-seeded.

Data collection efforts associated with the FIWP commenced in October 2005. A meeting of project stakeholders was held in October 2005 to identify unified goals and objectives that would drive the restoration design for Herrick Hollow Creek and adjacent wetlands.

Driven by these stakeholder agreed upon goals and objectives and informed by data collected through the FIWP effort, a Basis of Design for the Restoration of Herrick Hollow Creek (Barton & Loguidice, 2007) was prepared and submitted for agency review on February 14, 2007. Subsequent to a review and comment meeting of project stakeholders on June 14, 2007, the Final Basis of Design Report containing supplemental reference reach data was approved by USEPA in July 2007.

In November 2007, a Preliminary (50%) Restoration Design package was submitted to USEPA for agency review and comment. Comments were addressed and a final design submitted in March 2008. The Final (100%) Herrick Hollow Creek Restoration Design package was approved by USEPA in June, 2008.

2.3 Cultural Resource Investigation

According to information derived directly from The Final Remedial Report – Remedial Action Element I - Remedial Excavations and Capping Richardson Hill Road Landfill Site prepared by Parsons (2007), Phase 1 cultural resource surveys were initially conducted at the RHRL site by the Public Archaeology Facility (PAF) of the State University of New York at Binghamton in 1991 and 1992 (PAF, 1991; PAF, 1992, respectively). The reports were updated and submitted to the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) in 2001 for review. NYSOPRHP subsequently determined that the surveys did not address the entire project area, namely, the North Area, South Pond, Herrick Hollow Creek downstream of the South Pond, and between Herrick Hollow Creek and Richardson Hill Road. An additional Phase 1 cultural resource survey was conducted for these areas by PAF in September and October 2001. The additional Phase 1 cultural resource survey found seven prehistoric sites, named Herrick Hollow I thru VII (HHI thru HHVII), within the work area (PAF, 2001). The additional Phase 1 report was submitted to NYSOPRHP and USEPA for review. The agencies determined that Phase 2 cultural resource surveys would be required if it was not possible to avoid disturbing the sites, including a surrounding 50-ft buffer zone.

Phase 2 surveys were conducted by PAF between December 2001 and Fall 2002 since disturbance of the sites during remediation could not be avoided.

Based on the results of those surveys, NYSOPRHP and USEPA determined that the sites were eligible collectively as a prehistoric district for inclusion on the National Register of Historic Places and that Phase 3 data recovery investigations were required prior to disturbance.

The Phase 3 data recovery investigations were conducted by PAF for each Herrick Hollow Creek site between July 2002 and April 2003. Disturbance (remediation) of each site was allowed upon completion of the Phase 3 field work at each site. PAF prepared a consolidated report for the Phase 3 Data Recovery which was submitted to NYSOPRHP and USEPA in July 2005 (PAF, 2005).

An additional Phase 1 cultural resource survey was also conducted in 2003 for the downstream portion of Herrick Hollow Creek which had been added to the remediation. No cultural resources were discovered; therefore, no additional cultural resource work was required prior to disturbance of the downstream portion of Herrick Hollow Creek (PAF, 2003).

2.4 Remedy Summary

Remedial Objectives – In response to the damage to the initially reconstructed Herrick Hollow Creek in 2004 and 2005, the PRP's were required to develop a plan for restoring the creek utilizing natural stream channel design principles. Data collection in support of the design was done from Fall 2005 through the Spring of 2006. Two rounds of interim measures were implemented to provide short-term stability to the stream while the final design was developed. This design was approved in June of 2008 and construction commenced on July 1st, 2008.

2.4.1 Remedial Design

A summary of the primary components of the Remedial Action for Herrick Hollow Creek Restoration, as presented in the Basis of Design Report and Final (100%) and Herrick Hollow Creek Restoration Design Package (Barton & Loguidice, 2008), is presented below. Also presented are clarifications and field adjustments to the design that occurred during construction. In the subsections below, each summary of the design component is followed by a summary of the constructed component, in italics, for comparative purposes.

2.4.1.1 Stream Channel Profile

The approved design proposed an appropriate channel slope for restored stream Segments I, II, and III. The design slopes were derived from reduction of channel geometry data collected at two reference streams, and were adjusted to properly accommodate existing valley slope through the project area. Constructed channel profile would mimic the stable morphological form compatible with the restored stream valley and setting, as informed by reference reach data.

Stream channel slopes were constructed in accordance with the approved design and, as indicated, vary slightly, albeit within established ranges contained in the design documents, through the course of the restored stream in accordance with existing variations in valley conditions. Throughout the length of the restored channel, multiple instream structures (cross vanes, log vanes, and

cascades) were constructed to maintain the constructed stream bed at design elevations, create bed feature diversity, and enhance habitat.

During construction, a deviation from design profile occurred by a reduction in design elevations through stream design stations 14+54 to 16+80 (constructed stations 13+98 to 16+80). This change was made to eliminate the necessity to fill existing fringe wetlands and floodplains. This modification was achieved without any significant increase in average overall stream gradient. Specifics of this change are described in Section 3.2.7.2 of this report.

2.4.1.2 Stream Channel Planform

The approved design proposed that the restored channel planform exhibit a sinuosity compatible with a stable channel configuration given the existing valley conditions. Channel sinuosity would mimic that observed at a reference stream, adjusted to match the existing Herrick Hollow Creek corridor. Planform through Segments I and II would deviate from the existing impaired channel, while the constructed channel planform through Segment III would follow the pre-construction stream channel.

Channel planform was constructed in accordance with the approved design plans. Channel planform was greatly enhanced from the existing condition in Segments I and II, while in Segment III, the existing channel planform was mimicked.

2.4.1.3 Stream Channel Dimension

Stream channel dimension (bankfull channel cross-section geometry) would be constructed in a manner that mimics the appropriate morphologically stable form, as informed from reference reach data and depicted in the approved design. Bankfull geometry would accommodate the bankfull discharge, while creating channel sinuosity and slope that allowed for the appropriate transport of sediment during storm flows without excessive aggrading or degrading of the channel, maintaining stable channel morphology over time without contributing to sedimentation of downstream waterways (namely lower Herrick Hollow Creek, Trout Creek, and Cannonsville Reservoir).

Bankfull cross-section (stream channel dimension) was constructed in accordance with the approved design. Bankfull elevations were established at the top of stream banks to allow for floodplain access and connectivity of the stream channel to adjacent wetlands. Channel geometry allows for a stable sediment transport regime compatible with the given channel and valley conditions.

2.4.1.4 Wetland Restoration

Soil and vegetation conditions in the restored wetland areas would be enhanced and improved, and hydrologic connectivity to the stream channel would be restored. Stormwater and sediment detention features would be modified to replicate the form, function, and appearance of natural features in the landscape.

Wetland restoration areas were augmented with peat, tilled, and seeded with a wetland seed mix. Stream channel elevations were raised in the landscape to improve connectivity with adjacent wetlands. The restored stream channel was constructed to allow for floodplain access during high flows. Level spreaders were constructed in strategic locations to maintain and improve existing wetland hydrology and eliminate unnecessary point discharges of surface water to the stream thereby reducing the energy dissipation needs for the stream. Existing stormwater and sediment detention basins were restored to micro-pools that improve wildlife habitat and site aesthetics. Disturbed areas were seeded, and stream bank and floodplains areas were planted with shrubs and live stakes.

3.0 Construction Activities

3.1 Site Preparation and Construction Mobilization

Site preparation included clearing and grubbing of areas to be restored as wetlands, and some areas adjacent to the stream corridor to be restored. Stockpile areas in the vicinity of station 0+80 were protected with silt fence, and existing stockpiles of rock material to be used in the construction activities were secured.

Construction mobilization began on Tuesday July 1, 2008. Activities included receiving and stockpiling of construction materials onsite, including bank treatment materials such as coir fascines, coir mats, and rolls of erosion control mat. Construction equipment was brought on-site, originally consisting of an excavator and front-end loader. Additional hardware and tools required for construction were brought on site as needed.

3.2 Stream Channel Restoration

The primary construction component of the Project consisted of realignment and reconfiguration of the Herrick Hollow Creek stream channel. The restored reach extends 3,200 station feet, from the first existing ford downstream of South Pond (electric company ford) to a point approximately 200 feet upstream of the culvert under Richardson Hill Road. The restoration effort resulted in an extension of stream channel length to 3,558 feet in the as-built condition.

3.2.1 Construction Sequence

Typically, construction of the stream channel followed a daily routine. The sequence of activities generally was as follows:

- Set up of the pump-around system
- Channel layout
- Excavation of the new channel to be constructed that day
- QA check of sub-grade elevations
- Installation of coir fascines along the stream bank
- Excavation of footers for in-stream structures
- Construction of in-stream structures
- QA check of finished bank and structure elevations
- Installation of imported substrate (bed) material
- QA check of bed elevations and finished channel depth
- Grading of floodplain areas, including the pre-existing abandoned stream channel
- Installation of bank treatments and silt fence (where applicable)
- Shutdown of pump-around system (return stream flow to the channel)

3.2.2 Channel De-watering (Pump-Around System)

All construction activities within the channel were completed in a non-flowing condition. At the start of each construction day, stream flow was diverted around the portion of the stream to be constructed that day through the use of a pump-around system. The pump hoses returned water to the stream downstream of the active work area. At the end of the

day, the pump-around system was shutdown, allowing stream flow to return to the channel overnight. Dewatering was consistent with Constructions plans and specifications.

3.2.3 Channel Layout and Excavation

Prior to excavation of the design channel, the design channel layout was staked by the construction foreman and crew, usually to a length one hundred to two hundred feet in advance of ongoing excavation. Location of the design channel centerline was determined by scaling distances from established benchmark locations as indicated on the Construction Plans. These benchmarks were surveyed and marked with capped rebar pins in the field prior to mobilization at the site. Wooden grade stakes were set along the design channel centerline at the start, apex, and end of each channel meander (curve), indicating the depth of cut or fill needed at each point. Grade stakes were also set at locations where instream structures were to be constructed, indicating the depth of excavation required to establish a suitable footer for the structure.

Installation of appropriate substrate material in the design channel required the placement of imported gravel and cobble from an off-site source (Warren Gravel and Stone, Afton, NY; see Section entitled *Channel Substrate*). The design channel was excavated an additional 0.66 ft. (approx. 8 inches) below final design grade to accommodate the placement of this material. The toe of bank was excavated to 1.0 ft (12 inches) below final top of bank grade, to allow for the placement of coir fascines (twelve inches in diameter). Rough grades were prepared with an excavator, while fine grading was accomplished by hand.

Earth material generated through excavation of the design channel was used in various ways. In most instances, this material was used to fill portions of the existing channel abandoned by the design channel. Because the majority of the design channel was constructed at an elevation higher than the existing channel, fill was also used to regrade the floodplain so it would meet existing grade beyond the immediate stream bank area. In instances where substantial material was required to adjust floodplain grades so they would match both final streambank elevations and existing grades beyond the immediate channel area, borrow areas were developed as sources of additional fill. Borrow areas were created outside of the immediate stream corridor, and were constructed in compliance with Construction Specifications outlining acceptable criteria for borrow area creation. All borrow areas were constructed with side slopes of 10:1 or less, and were surrounded by silt fence and hydroseeded once no more fill was to be removed from the location. Multiple borrow areas were located along the course of the project corridor, with the two largest areas located in a wet meadow area to the east of the stream, near the lower project boundary.

Significant amounts of fill were required to reconstruct wetland fringe and floodplain areas through Segments I and II, namely because the stream channel bed was built higher in the landscape than the pre-existing channel, and because construction of a new channel planform required filling-in of the abandoned pre-existing channel. However, excess fill was generated during construction of stream Segment III, due to the fact that the existing channel planform was restored in place (leaving no abandoned channel to be filled in), and the existing channel was over-excavated to allow for placement of the imported gravel substrate. This material was then used to replenish those borrow areas

created during construction of Segments I and II. The restored borrow areas were then tilled and seeded. Additional fill material was stockpiled in a spoil area located on the hill directly north of the existing water treatment facility. This spoil area has been graded and seeded.

3.2.4 Bank Treatments

Biodegradable coir fascines were utilized throughout the length of the restored channel to provide additional short-term stabilization of the stream banks until such time as substantial bank vegetation can become established. Coir fascines were placed along the toe of the bank so that the top of the fascine matched the desired top of bank (bankfull) elevation, and the width of the channel between the two fascines on opposite banks matched the desired channel bankfull width.

Coir fascines were secured through the use of duckbill earth anchors, wood stakes and string. A pair of wood stakes, one to either side of the fascine, was driven into the ground. The tops of the wood stakes were bound to each other using string, effectively locking the coir fascine between the wood stakes. Earth anchors were attached to the fascines using 1/8 inch steel cable, and were then driven into the ground using a hammer drill and driving rod. Wood stakes and duckbill anchors were alternately installed along the length of each fascine at 3 ft intervals. Each fascine was sewn to the next downstream fascine by butting the ends together and sewing them with string.

Upon construction of the active stream channel, adjacent floodplain areas on both banks were graded to match existing grade outside of the disturbance area to the constructed top of bank elevations. These areas

were then stabilized by the application of a six foot wide coir mat immediately outside of the coir fascine along the streambank. The coir mat was sewn with string to the top of the coir fascine along its entire length, and secured in place using 6 inch pins. A seven foot wide erosion control mat was then secured to the outside edge of the coir mat. The erosion control mat was secured in place using 6 inch pins, and by burying the outside edge of the erosion control mat six inches into the ground, and securing with biodegradable wood stakes. This provided for 13 feet of stabilization mat outward from both of the constructed stream banks. In areas where minimal floodplain disturbance occurred, and soils were still well-vegetated, the outer erosion control mat was not applied.

3.2.5 In-Stream Structures

The Construction Plans for this Project included the installation of 33 cross vanes, 46 cascades, and 26 log vanes. These were constructed as indicated on the Construction Plans, with the exception of a proposed cascade at station 14+54, which was replaced with a cross vane, and a proposed cascade at station 16+27, which was eliminated from the design (see Section 3.2.7.2 entitled *Adjustments to Channel Elevations Stations 14+54 through 16+80)*. These adjustments were approved by the construction field engineer, in compliance with the Construction Specifications regarding installation of these structures. As a result of these changes, the final restored channel contains 34 cross vanes, 44 cascades, and 26 log vanes. A ford-style crossing was also constructed at the location of the existing Dimatos Crossing.

3.2.5.1 Cross Vanes

The cross vanes were constructed using a combination of blocky native rock and quarry stone measuring approximately 1 ft x 1.5 ft x 2 ft (12 x 18 x 24 inches) which made it possible for the contractor to achieve the necessary arm angles and arm slopes indicated in the Construction Plans and Specifications, while still utilizing rock large enough to resist design storm flows.

Cross vanes were built of two tiers of rock; a footer tier and vane (upper) tier. All rocks were placed using an excavator with hydraulic thumb. Footer rocks were placed keyed into the streambed, usually partly or mostly buried into the streambed. Vane rocks were placed in a recessed fashion on top of the footer rocks, so that water flowing over the vane rocks spills onto the top of the footer, thereby reducing the likelihood of undermining. Vane arms were keyed into each bank using rock averaging 1 ft x 1 ft x 2 ft in size. The top of the throat rock was constructed at the desired bed elevation as indicated on the Construction Plans. Cross vane arm angles were constructed at 20° to 30° tangent to the near bank; cross vane arm slopes ranged from 4% to 6%. Upon construction, all cross vanes were assigned an ID number of CV-1 through CV-34, progressing sequentially from upstream to down.

In all, 11 cross vanes were constructed in stream Segment I (station 0+00 to Dimatos Crossing) and 23 cross vanes were constructed in stream Segment II (Dimatos Crossing to station 22+95). As indicated, all cross vanes were constructed utilizing a

combination of blocky native rock and quarry bluestone supplied from a local quarry.

3.2.5.2 Cascades

Cascade structures were built of native rock material previously imported to the site, suitable native rock material found onsite, or from suitable native rock material unearthed during excavation of the design stream channel and structure footers. Rock used in construction of cascades was typically flat, blocky, angular, and ranged in median axis size from 0.63 ft to 1.83 ft (7.5 to 22 inches). The size of rock used in the construction of cascades was equal to, or in many cases (particularly in Segment II) larger than the material dictated by the Construction Plans and Specifications. Cascades were constructed of three or four tiers of rock, depending upon the thickness of rocks used. Cascades were constructed so that the throat of the cascade (point of interface between cascade and finished streambed) matched the desired bed elevation indicated on the Construction Plans.

Upon construction, cascades were assigned an ID number of A-1 through A-44 progressing sequentially from upstream to down. In all, 20 cascades were constructed in Segment I, and 24 cascades were constructed in Segment II.

3.2.5.3 Log Vanes

Twenty-six log vanes were constructed through stream Segment III (station 22+95 through 35+45). Log vanes were

constructed of red maple logs between 8 inches and 10 inches in diameter. Because of a request by NYSDEC to eliminate the use of rebar in the stream construction, duckbill earth anchors were used in their place (due to an editorial error, rebar is still indicated in the approved design detail for log vane construction). Log vanes were constructed of a footer log and a vane log, with the vane log slightly recessed on top of the footer log to reduce the threat of undermining. Footer logs were buried part way into the stream bed, and secured by driving two wood stakes on the downstream end of the footer log. The vane log was then placed over the footer log, and secured in position by attaching two earth anchors of the log with steel cable, and then driving the earth anchors into the streambed upstream of the log to prevent it from moving in high flows. Both the footer and vane logs were keyed into the stream bank two to three feet. A large boulder was placed in the streambank immediately downstream of the log key to prevent the keyed portion of the structure from moving downstream. Vane logs were placed so that the interface of the vane log with the final stream bed matched the desired bed elevation at that point. Log vane slopes were constructed at 4% to 6%, and log vane arm angles range from 20° to 30° tangent to the near bank. Upon construction, log vanes were assigned an ID number of L-1 through L-26 progressing sequentially from upstream to down.

3.2.3.5.4 Dimatos Crossing

A ford-style crossing was constructed at the location of the existing Dimatos Crossing, using articulated interlocking concrete paving blocks. Use of the blocks allowed the finished ford to exhibit

a more reduced, gradual slope than what could have been achieved with the concrete cattle slats originally prescribed in the design. This will provide greater ease of passage for vehicles utilizing the ford. The finished dimensions of the ford structure are 12 feet long (upstream to downstream) by 38 feet wide (from access road to access road on each bank).

3.2.6 Restored Channel Bed

Restoration of appropriately sized substrate material was achieved by placing a mix of cobble and finer gravel material into the reconstructed stream channel. Cobble and gravel was delivered to the site separately, and mixed onsite prior to placement in the channel. Substrate particle distribution was intended to mimic the specified gradation as indicated in the Construction Specifications. Constructed bed gradations, as indicated by random pebble counts collected within each stream Segment, were as follows:

Segment I	Segment II	Segment III
D_{16}= 6.5 mm	D_{16}= 5.3 mm	D_{16}= 2.8 mm
D_{35}= 23 mm	D_{35}= 38 mm	D_{35}= 7.6 mm
D_{50}= 33 mm	D_{50}= 54 mm	D_{50}= 21 mm
D_{84}= 55 mm	D_{84}= 90 mm	D_{84}= 80 mm
D_{95}= 73 mm	D_{95}= 130 mm	D_{95}= 110 mm

In construction of the stream bed, it was impossible to place each excavator bucket load of mixed cobble and gravel bed material to the precise specification intended. However, it is expected that as the stream is exposed to multiple bankfull flow events, the stream will mobilize, sort, and deposit bed material in a fashion more applicable to the given channel

morphology, and that the resultant bed particle distribution will more closely mimic the specifications over time. This natural and expected alteration of bed material will be tracked and reported through the prescribed post-construction monitoring plan.

3.2.7 Constructed Elements Deviating from the Design

3.2.7.1 Construction of Channel Block

Although not originally included in the design, a channel block was constructed across a low spot in the floodplain in the vicinity of station 9+25. The channel block consists of several large rocks (average median axis = 2 feet) across the low spot in the floodplain perpendicular to the flow path. The function of this channel block is to prevent excessive scour of the floodplain in this area that could potentially cause the stream to abandon the constructed channel in this reach and relocate to the west. The channel block eliminates this possibility. A photograph of the channel block is included in Appendix B.

3.2.7.2 Adjustments to Cross Vane Construction

There were two components of cross vane construction that deviated from the approved design documents.

1. Rock size – As written, the cross vane specification calls for a rock size of a minimum of 2 feet by 2 feet by 3 feet. In fact, this rock size specification was carried over in error from the original documents used

to define the construction of rock structures installed in the stream as interim remedial measures (IRMs) in September 2006, and was unnoticed during internal reviews of the document prior to distribution. Use of rocks of this size in the approved design would have made the cross-vanes un-constructible, as the large size of these rocks coupled with the relatively narrow width of the reconstructed channel would have prevented the contractor from achieving the appropriate slope and angle criteria of the cross vanes dictated in the specifications. In order to provide a rock material that would more effectively meet the performance requirements of the design and allow specified construction criteria to be met, the rock size was reduced to a minimum size of 1 foot by 1 foot by 1.5 feet.

2. Rock surfaces – As specified in SR03 – Cross Vanes, rock surfaces are to be free of cracks and other blemishes. As constructed, all surfaces of the rocks used in cross vane construction were flat, smooth, and unblemished. Upon requests from NYSDEC to enhance fish and wildlife passage, a jackhammer was used to chip and blemish the edges and surfaces of the rocks.

3.2.7.3 Adjustments to Channel Elevations Stations 14+54 through 16+80

During construction of Segment II, it became apparent that as the work progressed downstream in the vicinity of station 14+20, construction of the stream channel at the prescribed elevation would necessitate the filling of an exceptionally large area of wetlands adjacent to the stream in order to maintain the constructed stream channel as the feature of lowest elevation in the landscape. To resolve this issue, the channel components (structures and bankfull elevations) were constructed at elevations incrementally lower than those prescribed in the design between stations 14+54 and 16+80. Lowering the constructed elevation of in-stream structures built at stations 14+87, 15+04, 15+36, 15+74 and 16+17, gradual, incremental drops in stream elevation were made to achieve an overall drop in 1.5 feet between constructed and design elevation from station 14+54 to 16+80. The constructed elevation once again matched design elevation at station 16+80. Although the changes in stream channel elevations between stations 14+54 and 16+80 (a distance of 188 feet) result in localized variations in bed slope from those in the design, both average bed slope and overall channel slope was maintained through this reach of stream by maintaining design channel elevations upstream of 14+54 and downstream of 16+80. This change was made in order to eliminate the need to fill up to 200 feet of floodplain through this reach in order to maintain connection of floodplain to the channel at an appropriate slope. To provide additional support, the cascade structure prescribed in the design at station 14+54 was upgraded to a cross vane structure to add

additional grade control and remove the threat of channel headcutting across the adjusted reach.

Original bed and bankfull elevations are compared against constructed elevations below:

Cross vane (originally cascade) at 14+54

Design Bed – 1688.0
Design Bankfull – 1689.1
Constructed Bed – 1687.9
Constructed Bankfull – 1689.0

Cross Vane at 14+87

Design Bed – 1687.4
Design Bankfull – 1688.5
Constructed Bed – 1685.8
Constructed Bankfull – 1687.0

Cascade at 15+04

Bed – 1686.8
Bankfull – 1687.9
Constructed Bed – 1684.9
Constructed Bankfull – 1686.1

Cross Vane at 15+36

Bed – 1685.4
Bankfull – 1686.5
Constructed Bed – 1683.6
Constructed Bankfull- 1684.7

Cascade at 15+74

Bed – 1683.6
Bankfull – 1684.7
Constructed Bed – 1682.1
Constructed Bankfull – 1683.1

Cross Vane at 16+17

Bed – 1682.1
Bankfull – 1683.2
Constructed Bed – 1680.5
Constructed Bankfull – 1681.4

The cascade structure originally designed at station 16+27 was eliminated (was not constructed) due to the fact that the structure may have been close enough to the downstream end of the preceding cross vane (located 8 feet upstream at station 16+17) to potentially inhibit the ability of that structure to function properly, especially during high flow events. The constructed channel was 'reconnected' with original design elevations at the construction of a cascade structure prescribed in the design at station 16+80.

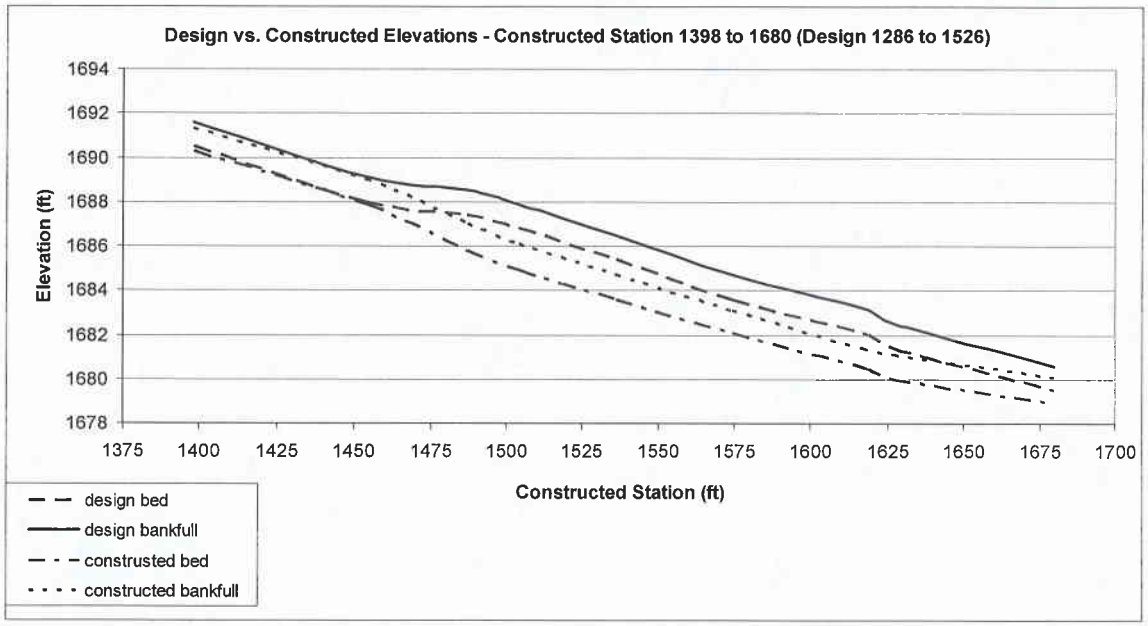


Figure 1
Design and constructed elevations through stations 13+98 through 16+80.

3.2.7.4 Dimatos Crossing

The construction of the Dimatos crossing deviated from the design through the use of porous concrete pavers instead of the cattle slats specified in the design drawings. This alternative method was proposed by the contractor as a method which would result in a more natural profile with similar or improved durability and identical functionality to that achieved through the use of the cattle slat structure. It should be noted that the plans allowed for the substitution of these types of materials for this structure.

3.3 Wetland Restoration

3.3.1 Grading, Tilling and Seeding

Existing wetland and transition areas were machine tilled, and seeded with a wetland seed mix as indicated in the Construction Specifications in the following areas:

- Area to the immediate east, southeast, and southwest of South Pond
- Area to the east of Herrick Hollow Creek from the outlet of South Pond downstream to station 0+00
- Area immediately to the east of the restored stream channel in the vicinity of stations 21+45 to 35+45
- Area to the west of the restored channel from the vicinity of stations 10+50 to 30+80

Restored wetland areas to the west of the stream channel were re-graded upon excavation and removal of the pre-existing access road that paralleled the stream corridor. Rock and soil material removed from the access road was stockpiled in the spoil area to the north of the water treatment facility. Peat was added to all tilled areas within the wetland restoration area to achieve a minimum 5% organic matter concentration by weight.

Portions of the proposed wetland seed mix 1 tilling/seeding area on the east bank between stations 26+70 and 30+80 were not tilled nor seeded based on well established wetland vegetation in these areas. Established wetland plant species already established in these areas included boneset (*Eupatorium perfoliatum*), cattail (*Typha sp.*), willow shrubs (*Salix sp.*), narrow-leaved meadowsweet (*Spiraea alba*), and spotted Joe-Pye-weed (*Eupatoriadelphus maculates*).

3.3.2 Level Spreaders

Level spreaders have been constructed in the following locations, in accordance with design plans:

- Two concentrated flows from the headwater wetland into South Pond, located along the north edge of the pond.
- In the left (east) floodplain area of Herrick Hollow Creek, in the vicinity of station 9+25, just downstream of Dimatos Crossing where drainage from a large seepage area and a constructed pond entered the creek and created a head cut. The level spreader will stop this erosive situation and create

a vernal pool during high surface and groundwater discharges within the basin.

- At outlet to the wetland area in the right (west) floodplain in the vicinity of station 25+25.
- At the fringe and outlet of the large wetland area to the east of the stream, in the vicinity of station 26+80.
- At the stream outlet exiting the large wetland area to the east of the stream, in the vicinity of station 29+25.
- Within the wet meadow to the east of the stream near station 33+20.

3.3.3 Plantings

Woody plantings consisting of various species of shrubs were made in the areas listed below. These locations were identified as potential high shear stress areas of the stream and warranted supplemental plantings which would establish more quickly than the live stakes. Shrubs grown utilizing the Root Propagation Method (RPM) developed by RPM Ecosystems were used. Shrub species planted include silky and red-osier dogwood, elderberry, and pussy willow.

- Along the existing drainage ditch and sediment basin to the northwest of South Pond.
- Along both banks of Herrick Hollow Creek from the outlet of South Pond downstream to the wet area approx. 300 feet north of stream station 0+00.

- Around the perimeter of the modified stormwater basin at the upper end of the stream restoration area.
- At the level spreader constructed in the vicinity of station 9+25.
- Along both banks of the stream from stations 11+00 to 14+20.
- Along the right bank of the stream from station 14+80 to ~16+10.
- Along both stream banks from station 17+60 to 19+25.
- Along both stream banks from station 22+10 to 22+75.
- Between the stream and level spreader constructed at station 25+25.
- Along the level spreader constructed to the east of the stream near station 26+80.
- Around the level spreader constructed near 29+25.
- Around the level spreader near 33+20.

3.3.4 Live Stakes

Live stakes have been installed within the immediate stream corridor (within the area 13 feet to either side of the channel, stabilized with coir mat or erosion control mat). Species installed include silky dogwood (*Cornus amomum*), red-osier dogwood (*Cornus stolonifera*), pussy willow (*Salix discolor*), and black willow (*Salix nigra*). Additional live

stakes were placed in areas of low relief along the constructed floodplain in Segments I and II, to aid in revegetation of these areas. Specifically, additional live stakes were placed in the following areas:

- Along the outer edge of the left (east) floodplain from location of cascade A-15 (5+60) downstream to Dimatos Crossing, and from the downstream side of the crossing downstream to the level spreader constructed in the vicinity of station 9+25.
- In the low-lying area to the outside of the right (west) floodplain from CV-12 (8+25) downstream to around station 9+25.
- In the area between the left stream bank and existing tree line from roughly station 13+35 downstream to cascade A-35 (station 15+04).

Live stakes have been planted at the site as shown on the design plans and in the supplemental areas identified above.

4.0 Chronology of Events

Date	Event
September 30, 1997	ROD signed for Richardson Hill Road Landfill
February 16, 1999	Consent Decree between USEPA, AlliedSignal, and Amphenol lodged with US District Court.
August 18, 1999	Remedial Design Work Plan submitted to USEPA.
September 22, 1999	Remedial Design Work Plan approved by USEPA.
October 11, 1999	Revisions to Remedial Design Work Plan distributed.
August 22, 2002	Final (100%) Remedial Design Report submitted to USEPA.
March 17, 2003	Draft Remedial Action Work Plan for Remedial Work Element I submitted to USEPA.
April 7, 2003	Mobilization for Remedial Work Element I
May 7, 2003	Remedial Design Report approved by USEPA. (Balance of remediation, including Remedial Work Element I. Approval based on letters submitted by Parsons on January 16, 2003 and April 11, 2003). Herrick Hollow Creek Segments #9 through #13 incorporated into remedial excavations.
October 14, 2004	Completed excavation of Herrick Hollow Creek
November 16, 2004	Completed topsoil placement and seeding at South Pond.
December 12, 2004	Completed backfilling, topsoil placement, seeding, and installed plantings at Herrick Hollow Creek.
July 2005	Field Investigation Work Plan Submitted to USEPA
August 2005	Field Investigation Work Plan Approved by USEPA
September 16, 2005	Construction of initial STIMs completed
September 14, 2006	Repair and upgrade of STIMs completed
February 14, 2007	Draft Basis of Design Report submitted to USEPA
May 2007	Final (100%) Basis of Design submitted to USEPA
July 2007	Final (100%) Basis of Design approved by USEPA
December 2007	Preliminary (50%) Herrick Hollow Creek Restoration Design submitted to USEPA
March 2008	Final (100%) Herrick Hollow Creek Restoration Design submitted to USEPA
June 10, 2008	Final (100%) Herrick Hollow Creek Restoration Design approved by USEPA
July 1, 2008	Mobilization for Remedial Action for Herrick Hollow Creek Restoration
July 8, 2008	Stream channel restoration commenced
June 30, 2008	Initial stream Segment I restoration completed
September 2, 2008	Restoration of stream Segment II completed
September 17, 2008	Restoration of stream Segment III completed

Date	Event
September 26, 2008	Final Site Inspection
October 3, 2008	All seeding and shrub plantings completed
November 14, 2008	Installation of live stakes completed

5.0 Performance Standards and Construction Quality Assurance/Quality Control

5.1 Overview

No formal QAPP was prepared for this Remedial Action. However, documented quality assurance measures were consistently implemented in the field through the construction of the Project.

5.2 Construction Observation and Inspection

One or more construction inspectors from Barton & Loguidice were on site for the duration of the Remedial Action until all substantive aspects of the stream and wetland restoration work were completed. While on site, inspectors worked in close coordination to document proper installation of all components of the stream and wetland restoration work, including stream bank treatments, in-stream structures, channel layout, substrate restoration, etc. All excavated sub-grades for channel excavation and footer excavations for construction of in-stream structures were checked prior to construction by transit-stadia survey, tied to a benchmark of known elevation established in the field. Finished elevations of key structure aspects (bed elevation at throat, bankfull elevation at arms) and coir fascines (top of bank/bankfull elevation) were checked upon construction of each structure, or placement of coir fascines. Appropriate channel width was checked by measuring between coir fascines along either stream bank both prior to and after securing the coir fascines in place. Angles, slopes and elevations of in-stream structures were verified in the field upon completion of each structure. Periodically, finished channel cross-sections were surveyed and plotted by construction inspectors to ensure that proper channel cross-section geometry was achieved.

Given that natural materials used for construction were understood to have some minor inconsistencies in size and shape, field verification of all constructed stream restoration component elevations maintained a 0.15 ft. acceptable margin of error. Final constructed elevations within 0.15 ft +/- design elevation were accepted. These numbers will be validated once the as-built survey becomes available.

5.3 Daily Inspection Reports

Construction inspectors from Barton & Loguidice prepared daily inspection reports for each work day. These reports contain information such as work performed, equipment used, daily progress, number and location of instream structures constructed, weather conditions, and general notes regarding daily events. These daily reports were routinely posted on the project ftp site for stakeholder review, and are included as Appendix C to this report.

5.4 Photographic Log

Throughout the construction process, photographs were taken to document construction procedures, site conditions, daily progress, condition of completed instream structures, etc. Many of these photographs were included with daily inspection reports posted on the project ftp site for stakeholder review. A catalogue of selected photographs depicting key aspects of the construction process is included as Appendix B to this report.

5.5 Project Status Meetings

Bi-weekly status meetings were held during the course of this Remedial Action. Progress meetings were open to participation by representatives of USEPA, NYCDEP, NYSDEC, USFWS, DA Collins, Amphenol/Honeywell, and Barton & Loguidice. Meeting minutes were recorded for each meeting, and include information on project progress, concerns, projected schedules, materials information, etc. Bi-Weekly meeting minutes were made available electronically to all project stakeholders through the project ftp site.

6.0 Supplemental Information

6.1 Health and Safety

DA Collins prepared a Project Health and Safety Plan specific to the duties they would conduct during the construction of this Remedial Action. A daily safety meeting was held by DA Collins prior to the start of each work day. No incidents or injuries occurred during construction of this Remedial Action.

6.2 Site Specific Observations and Lessons Learned

Site specific observations and lessons learned include:

- The use of properly sized and shaped rock material is essential in construction of cross vane structures. In the case of Herrick Hollow Creek, the narrow channel width made constructing these structures at the specified arm angles and slopes quite challenging, requiring selection of rocks uniform enough in shape to achieve precise angles and slopes over short distances and limit leakage through the structure. At the same time, the rocks must be sized small enough to allow manipulation in the channel, but large enough to withstand the design flood events.

6.3 Project Costs

A table outlining project costs, as provided by Amphenol, is included as Table 2 below.

Table 2 Richardson Hill Landfill Site Herrick Hollow Creek Restoration Cost Summary			
Cost Item	**Estimated Costs**	**Actual Costs**	**Notes**
RA Capital Cost	$1,099,030	$1,494,023	
RA Monitoring Costs	$ 93,000	$ 93,000 (est.)	1
RA Total Costs (includes est monitoring costs)	$1,192,030	$1,494,023	
Difference between Actual and Estimated Capital Costs			

Notes:
1. Stream monitoring proposed for (3) year period
2. Difference attributable to factors such as weather, schedule, additionals to scope.

6.4 Status of Institutional Controls

The status of institutional controls has been provided to USEPA by separate communication by Amphenol and Honeywell. A Notice to Successors-in-Title for the property on which the Richardson Hill Road Landfill (Property) is located has been recorded in the Delaware County Clerk's Office in the State of New York on September 20, 2007, that the Property is subject to environmental restrictions.

7.0 Operation and Maintenance

7.1 Operation and Maintenance Manual

A site-wide Operation and Maintenance Manual for Post Remedial Activities (site-wide O&M Manual) has been prepared for the site (Parsons, 2007b). This site-wide O&M Manual includes procedures for inspection and maintenance of the landfill cap, TSCA cell, stormwater control features, and other site features.

7.2 Herrick Hollow Creek Restoration Post-Construction Monitoring Plan

A post-construction monitoring plan has been developed for the Herrick Hollow Creek Restoration. This plan is provided in Appendix E of this report.

8.0 Final Inspection and Certification

8.1 Final Inspections

Barton & Loguidice and DA Collins participated in a pre-final inspection walkthrough of the Remedial Action for Herrick Hollow Creek Restoration project site on September 18, 2008. A punchlist prepared from that inspection was developed and submitted to USEPA on September 25, 2008 for use in the final inspection, which was held September 26, 2008. Present at the final inspection were representatives of USEPA, NYSDEC, NYCDEP, JTM Associates, Barton & Loguidice and DA Collins.

8.2 Record Drawings

Pursuant to Section 10.C.4.b of the Statement of Work, Record Drawings for constructed elements of Remedial Action for Herrick Hollow Creek Restoration constructed pursuant to the Consent Decree are included as Appendix A to this report. These drawings are sealed and signed by a Professional Engineer licensed in the State of New York.

8.3 Notice of Completion

Pursuant to Section 10.C.6 of the Statement of Work, the following notice of completion is given, signed and sealed by a Professional Engineer licensed in the State of New York.

> I certify that I am a Professional Engineer licensed in the State of New York. In my professional opinion, based on review of available project documents and observations during site visits, the Remedial Construction for Remedial Action for Herrick Hollow Creek Restoration was completed in full satisfaction of the Consent Decree, Statement of Work, and USEPA-approved Restoration Design, as documented in this Remedial Action Report (RAR), which includes documented design and construction modifications.

By: Scott D. Nostrand

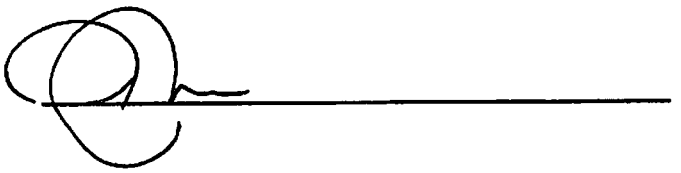
NYS PE # 075454

BARTON & LOGUIDICE, P.C.

8.4 Certification

Pursuant to Section 10.C.8 of the Statement of Work, the following certification is given, signed by a qualified Amphenol representative.

To the best of my knowledge, after thorough investigation, I hereby certify that the information contained in or accompanying this submission is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

By: 

Title: GROUP MANAGER, EH+S

AMPHENOL

9.0 References

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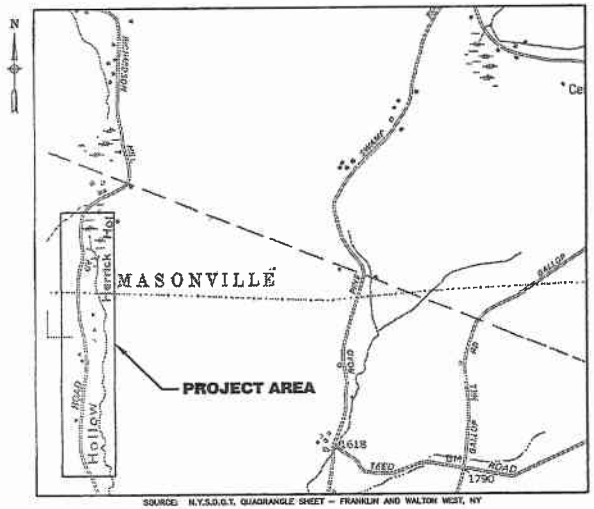
Appendix A

Record Drawings



SOURCE: N.Y.S.D.O.T. QUADRANGLE SHEET – FRANKLIN AND WALTON WEST, NY

LOCATION PLAN

NOT TO SCALE

COMPLETED CONSTRUCTION DRAWINGS

DRAFT

AMPHENOL CORPORATION

HERRICK HOLLOW CREEK RESTORATION

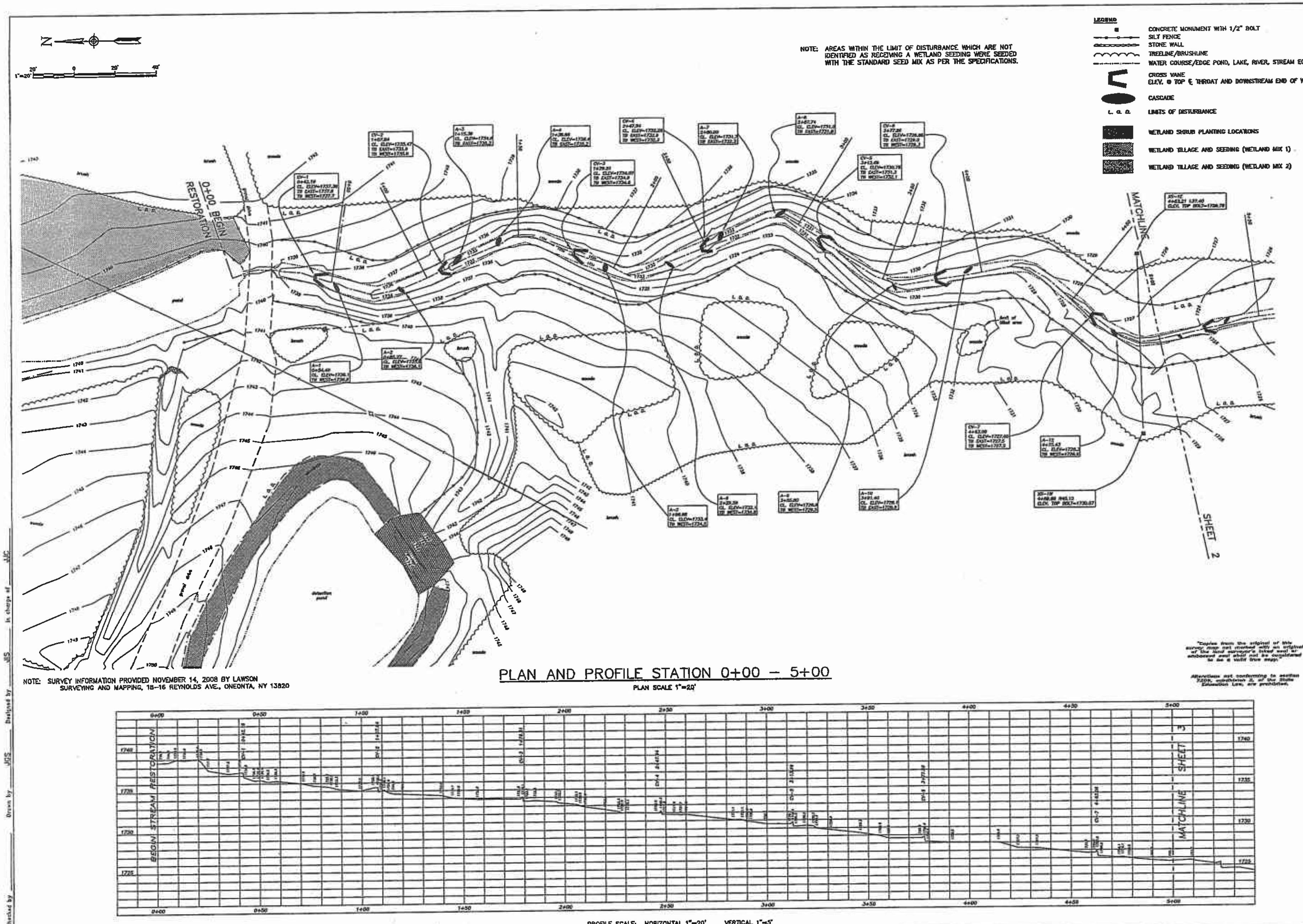
TOWN OF SIDNEY AND MASONVILLE
DELAWARE COUNTY, NEW YORK

NOVEMBER 2008

INDEX

Barton & Loguidice, P.C.
Engineers · Environmental Scientists · Planners · Landscape Architects

FILE NO. 824.006-01S



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COMPLETED CONSTRUCTION

Significant Construction Changes Are Shown

By ____ Date ____

Ch'd ____ Date ____

REVISIONS

AMPHENOL CORPORATION
HERRICK HOLLOW CREEK RESTORATION
COMPLETED CONSTRUCTION DRAWINGS

AS-BUILT CONDITIONS (SHEET 1 OF 10)

TOWN OF SIDNEY AND MASONVILLE, DELAWARE COUNTY, NEW YORK

Barton & Loguidice, P.C.

DRAFT

Date: NOVEMBER, 2008

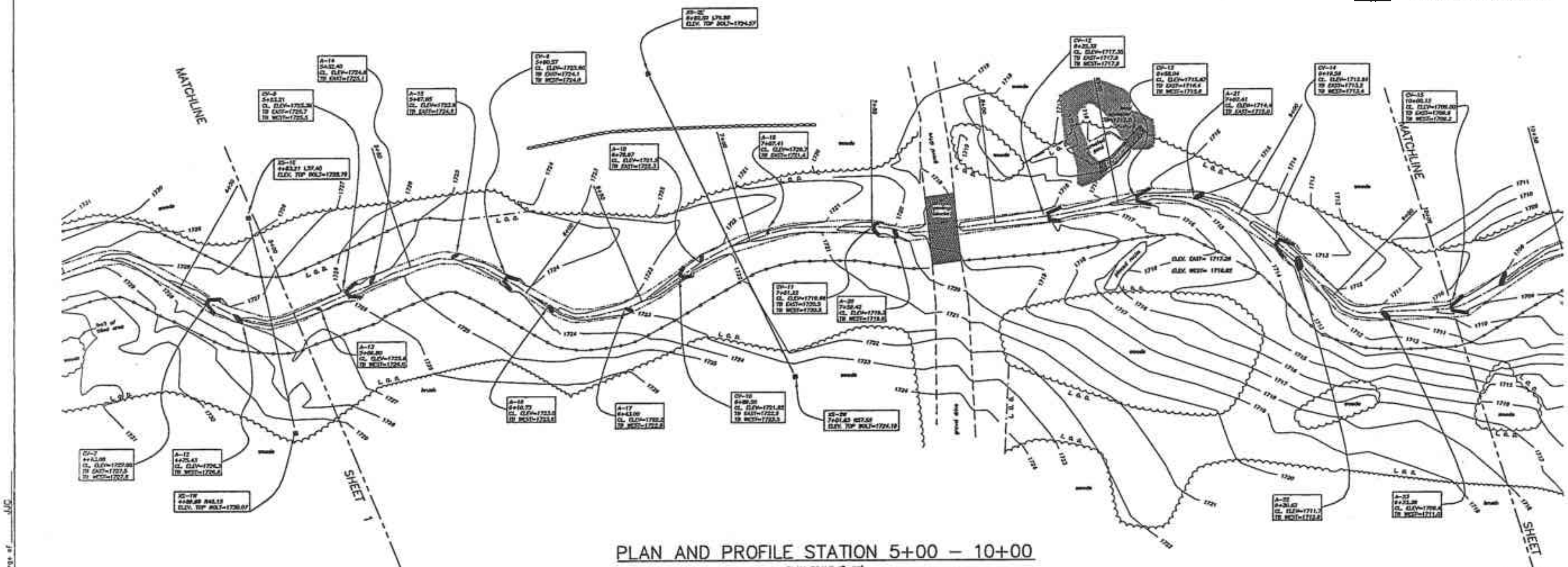
Scale: AS SHOWN

Sheet Number: 1

File Number: 824.006-02S

NOTE: AREAS WITHIN THE LIMIT OF DISTURBANCE WHICH ARE NOT IDENTIFIED AS RECEIVING A WETLAND SEEDING WERE SEEDED WITH THE STANDARD SEED MIX AS PER THE SPECIFICATIONS.

LEGEND
- CONCRETE MONUMENT WITH 1/2" BOLT
- SILT FENCE
- STONE WALL
- TREELINE/BRUSHLINE
- WATER COURSE/EDGE POND, LAKE, RIVER, STREAM ECT.
- CROSS VANE ELEV. @ TOP ℄ THROAT AND DOWNSTREAM END OF WING
- CASCADE
- L.O.D. LIMITS OF DISTURBANCE
- WETLAND SHRUB PLANTING LOCATIONS



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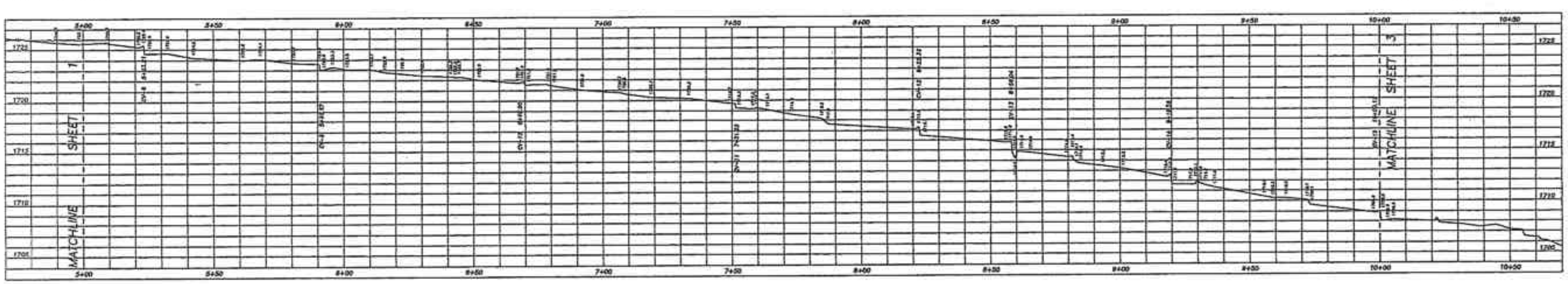
NOTE: SURVEY INFORMATION PROVIDED NOVEMBER 14, 2008 BY LAWSON SURVEYING AND MAPPING, 18-16 REYNOLDS AVE., ONEONTA, NY 13820



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COMPLETED CONSTRUCTION

Significant Construction Changes Are Shown

By ____ Date ____
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REVISIONS

AMPHENOL CORPORATION
HERRICK HOLLOW CREEK RESOTRATION
COMPLETED CONSTRUCTION DRAWINGS
AS-BUILT CONDITIONS (SHEET 2 OF 10)

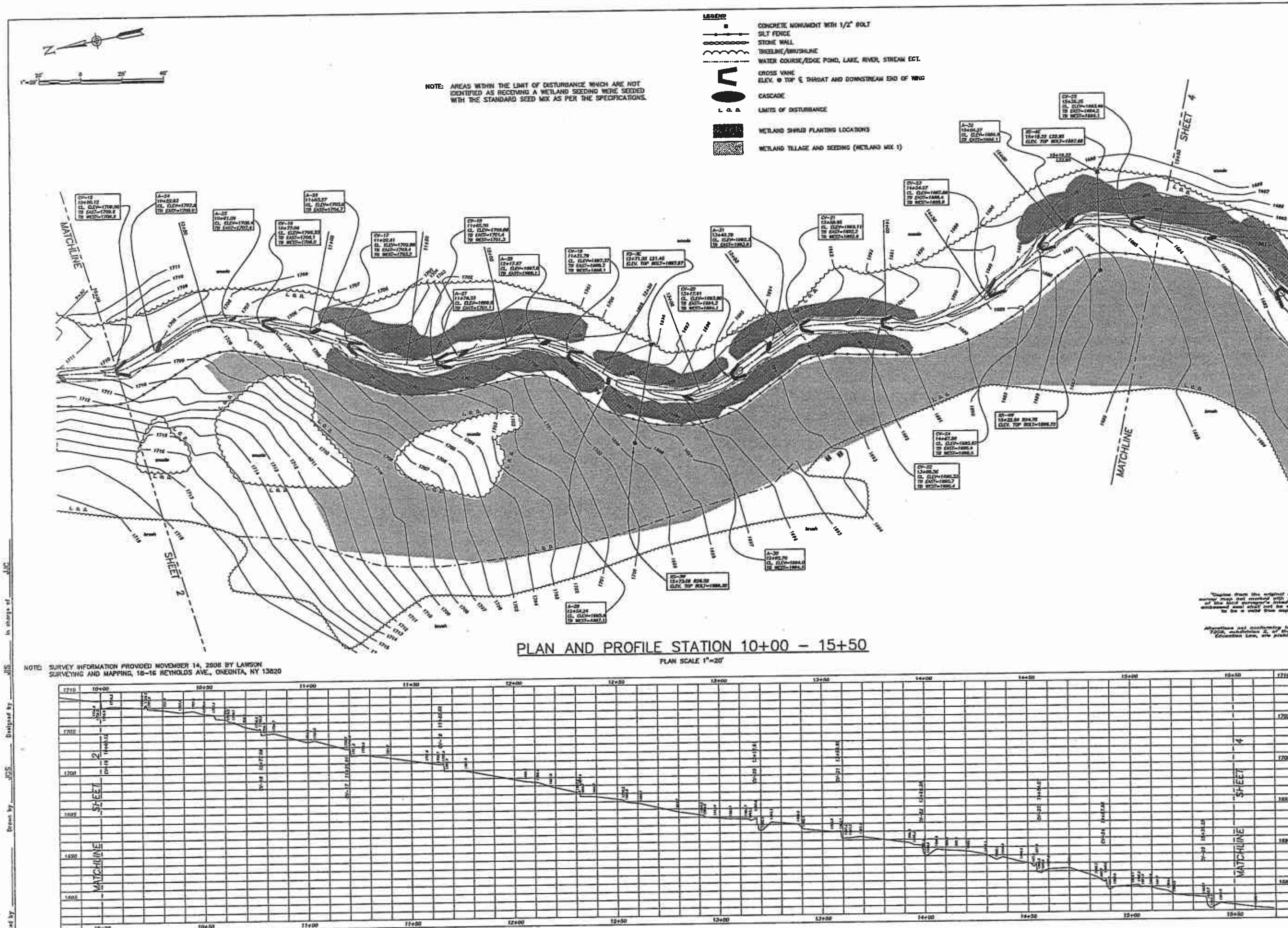
TOWN OF SIDNEY AND MASONVILLE — DELAWARE COUNTY, NEW YORK

Barton & Loguidice, P.C.

DRAFT

Date: NOVEMBER, 2008
Scale: AS SHOWN
Sheet Number: 2
File Number: 824.006-03S

Drawn by: JRS — Designed by: JRS — In charge of: JJC — Checked by



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By____ Date____
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REVISIONS

AMPHENOL CORPORATION
HERRICK HOLLOW CREEK RESOTRATION
COMPLETED CONSTRUCTION DRAWINGS

AS-BUILT CONDITIONS (SHEET 3 OF 10)

TOWN OF SIDNEY AND MASONVILLE — DELAWARE COUNTY, NEW YORK

Barton & Loguidice, P.C.

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Date: NOVEMBER, 2008

Scale: AS SHOWN

Sheet Number: 3

File Number: 824.006-04S

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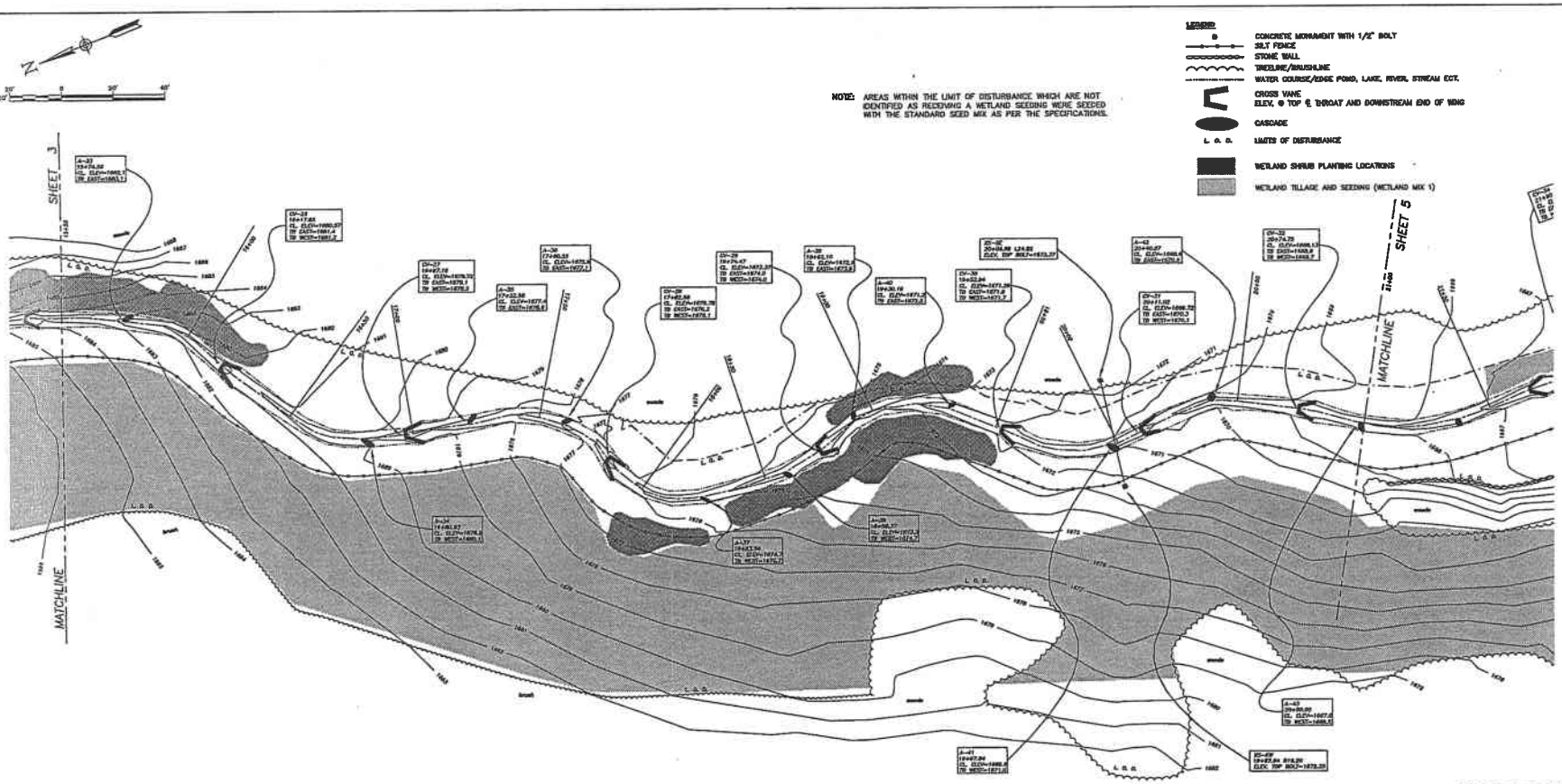

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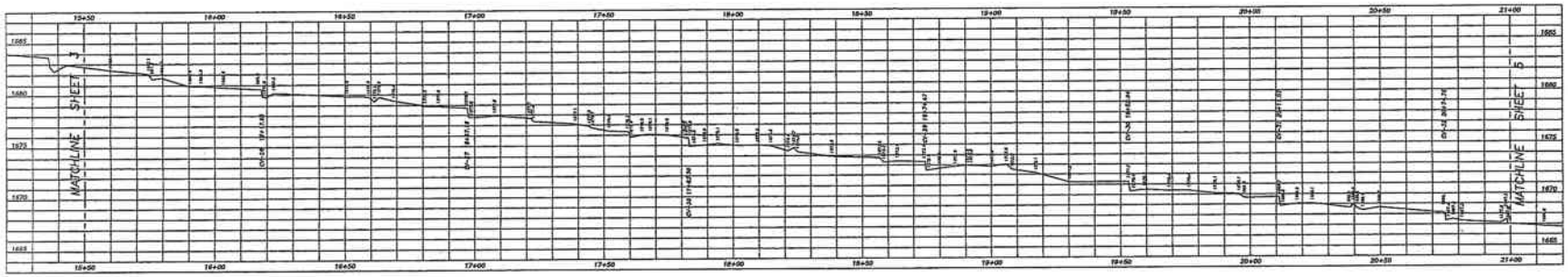

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By _____ Date _____

REVISIONS

AMPHENOL CORPORATION
HERRICK HOLLOW CREEK RESTORATION
COMPLETED CONSTRUCTION DRAWINGS

AS-BUILT CONDITIONS (SHEET 4 OF 10)

TOWN OF SIDNEY AND MASONVILLE DELAWARE COUNTY, NEW YORK

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Date: NOVEMBER, 2008

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Sheet Number: 4

File Number: 824.006-05S

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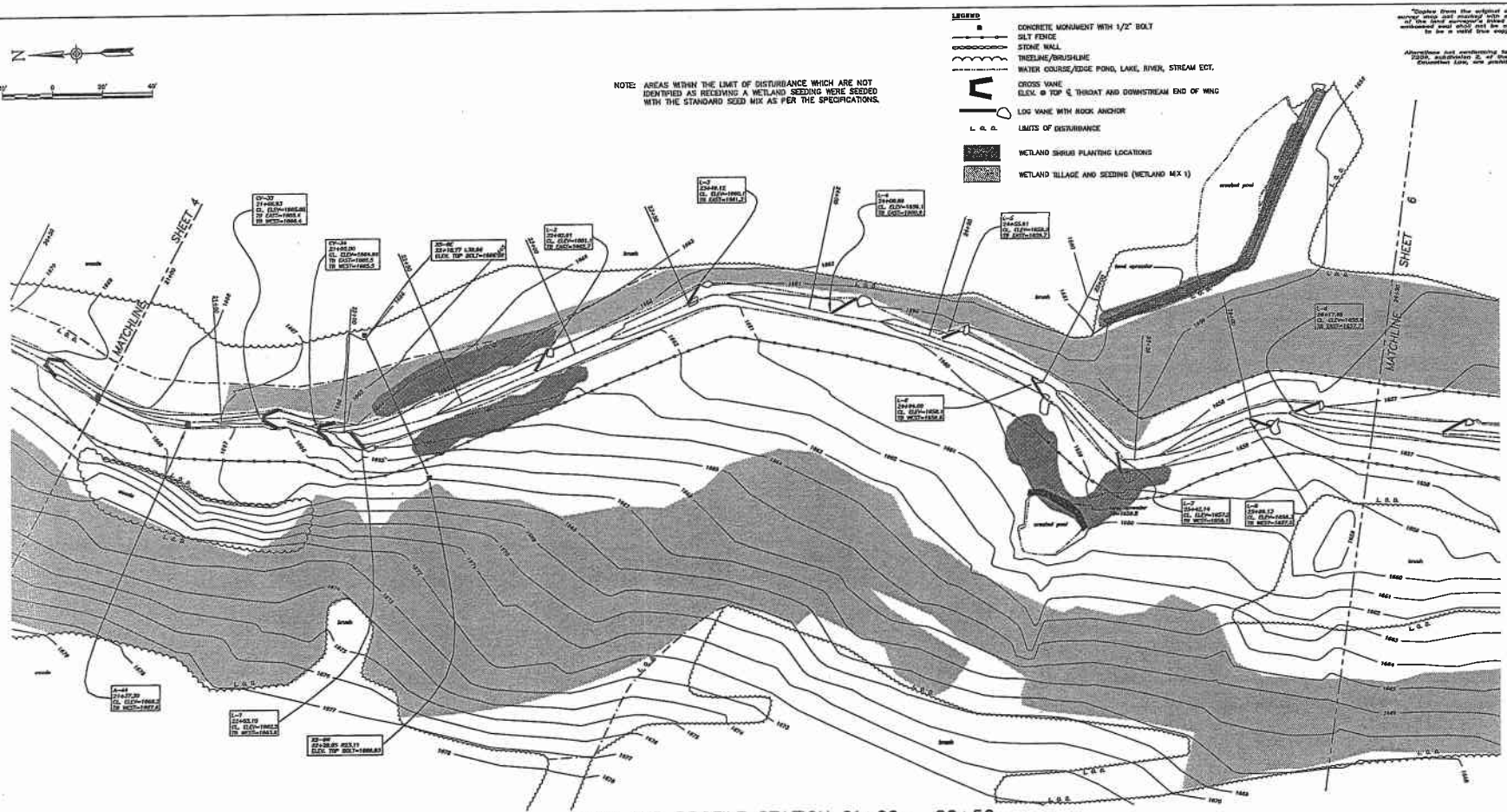

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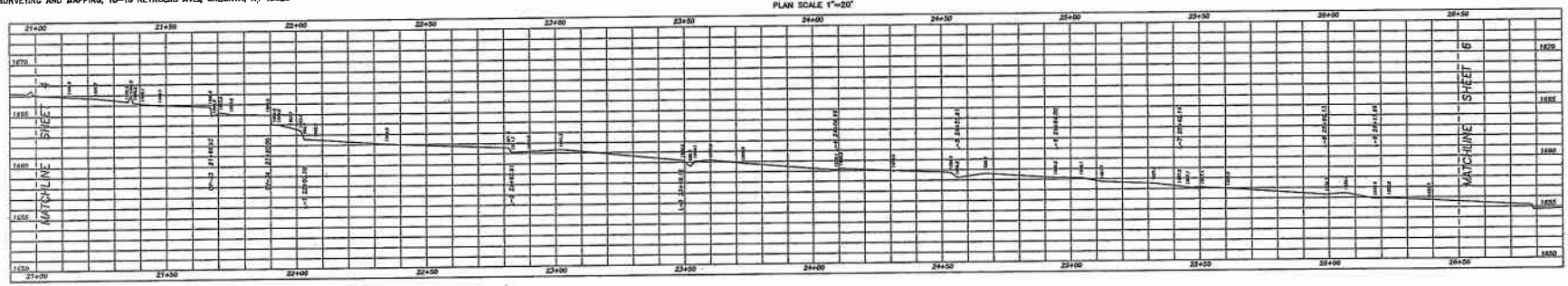

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By _____ Date _____

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REVISIONS

AMPHENOL CORPORATION

HERRICK HOLLOW CREEK RESOTRATION
COMPLETED CONSTRUCTION DRAWINGS

AS-BUILT CONDITIONS (SHEET 5 OF 10)

TOWN OF SIDNEY AND MASONVILLE DELAWARE COUNTY, NEW YORK

Barton & Loguidice, P.C.

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Date: NOVEMBER, 2008

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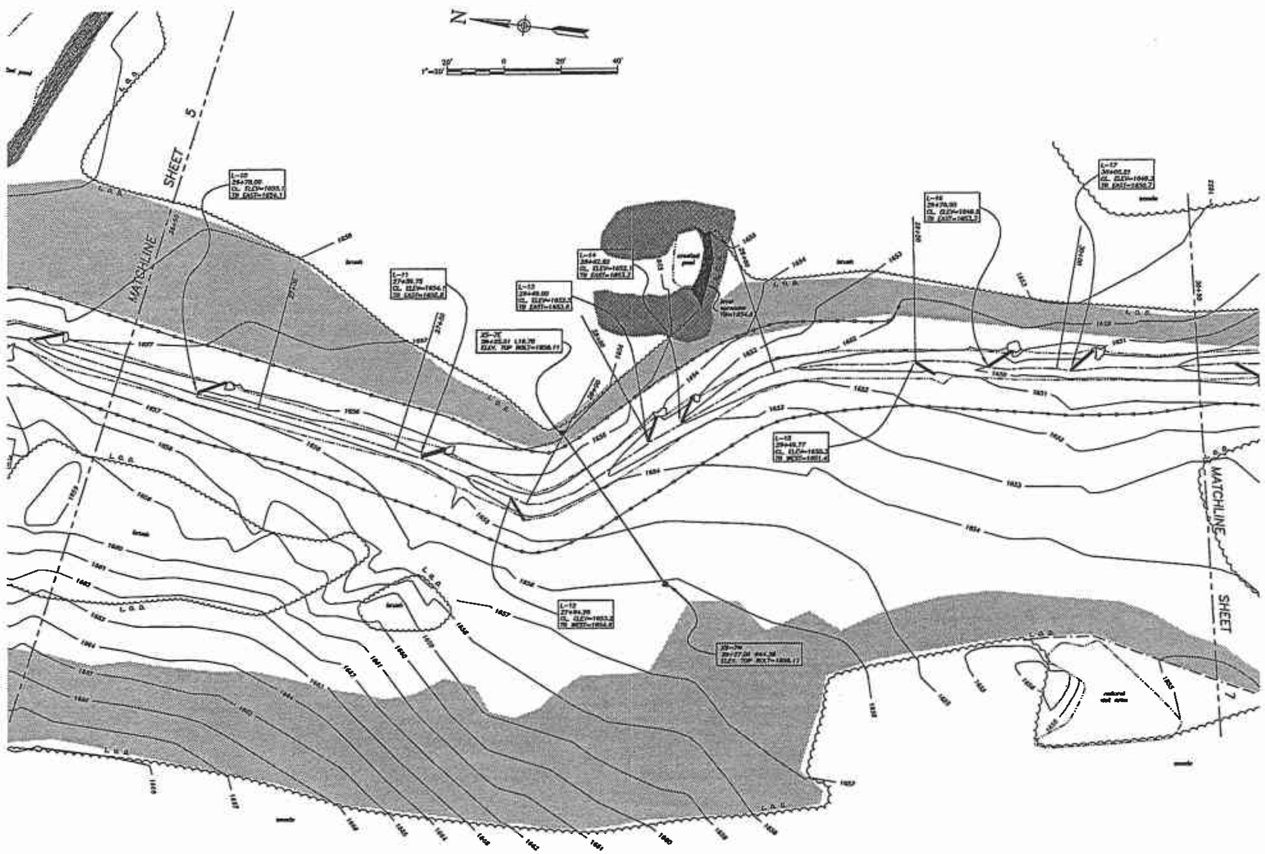

LEGEND

- CONCRETE MONUMENT WITH 1/2" BOLT
- SILT FENCE
- STONE WALL
- TREELINE/BRUSHLINE
- WATER COURSE/EDGE POND, LAKE, RIVER, STREAM ECT.
- CROSS VANE ELEV. @ TOP & THROAT AND DOWNSTREAM END OF WING
- LOG VANE WITH ROCK ANCHOR
- L. O. D. LIMITS OF DISTURBANCE
- WETLAND SHRUB PLANTING LOCATIONS
- WETLAND TILLAGE AND SEEDING (WETLAND MIX 1)

NOTE: AREAS WITHIN THE LIMIT OF DISTURBANCE WHICH ARE NOT IDENTIFIED AS RECEIVING A WETLAND SEEDING WERE SEEDED WITH THE STANDARD SEED MIX AS PER THE SPECIFICATIONS.

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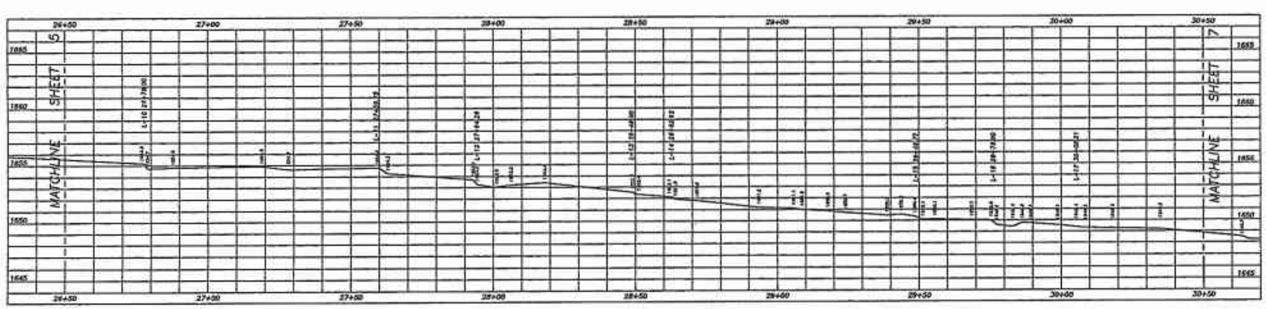

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COMPLETED CONSTRUCTION

Significant Construction Changes Are Shown

By ____ Date ____

Ck'd ____ Date ____

REVISIONS

AMPHENOL CORPORATION
HERRICK HOLLOW CREEK RESOTRATION
COMPLETED CONSTRUCTION DRAWINGS

AS–BUILT CONDITIONS (SHEET 6 OF 10)

TOWN OF SIDNEY AND MASONVILLE DELAWARE COUNTY, NEW YORK

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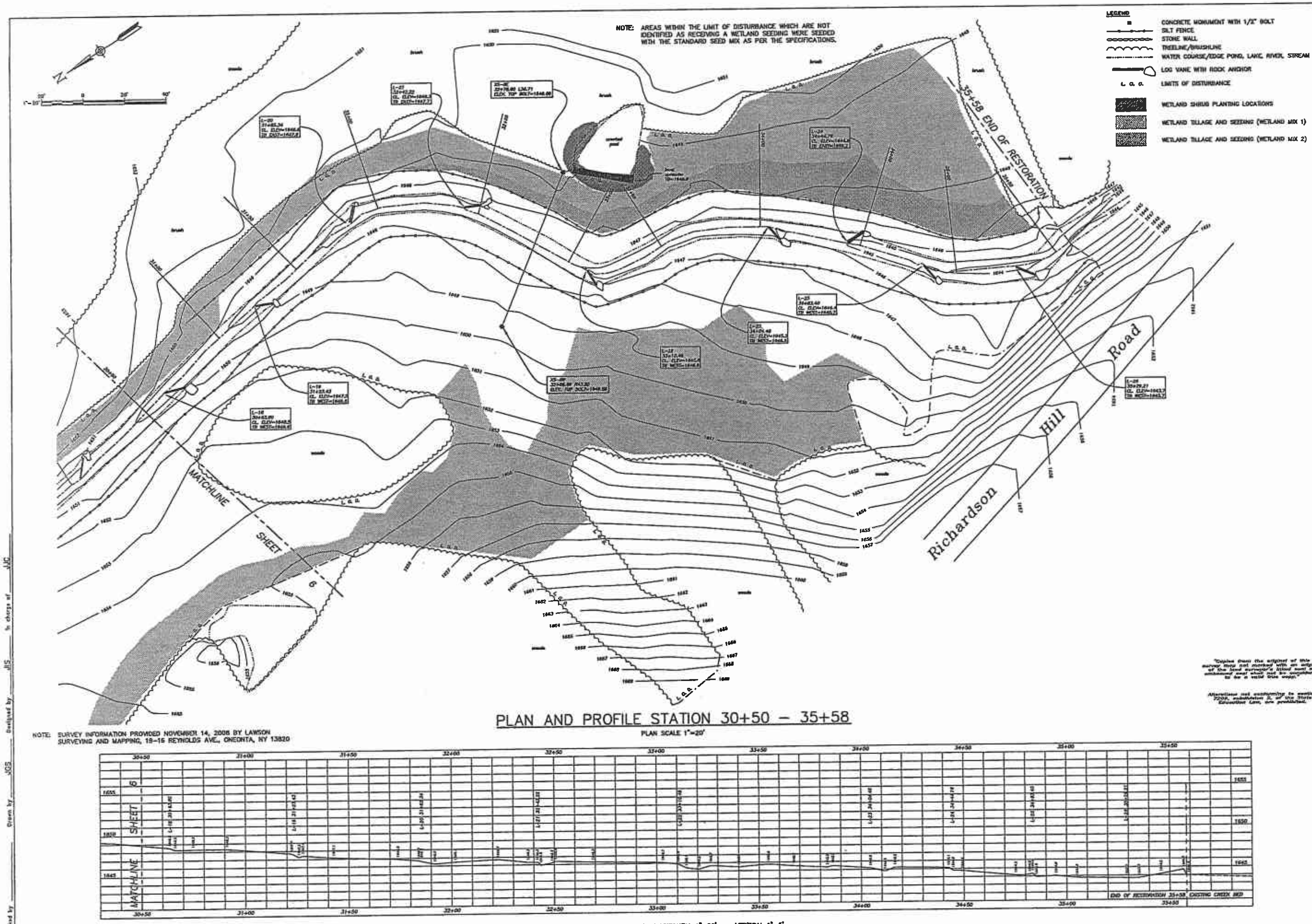

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Significant Construction Changes Are Shown

By ____ Date ____
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REVISIONS

AMPHENOL CORPORATION
HERRICK HOLLOW CREEK RESOTRATION
COMPLETED CONSTRUCTION DRAWINGS

AS-BUILT CONDITIONS (SHEET 7 OF 10)

TOWN OF SIDNEY AND MASONVILLE — DELAWARE COUNTY, NEW YORK

Barton & Loguidice, P.C.

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Date	NOVEMBER, 2008
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File Number	824.006-08S

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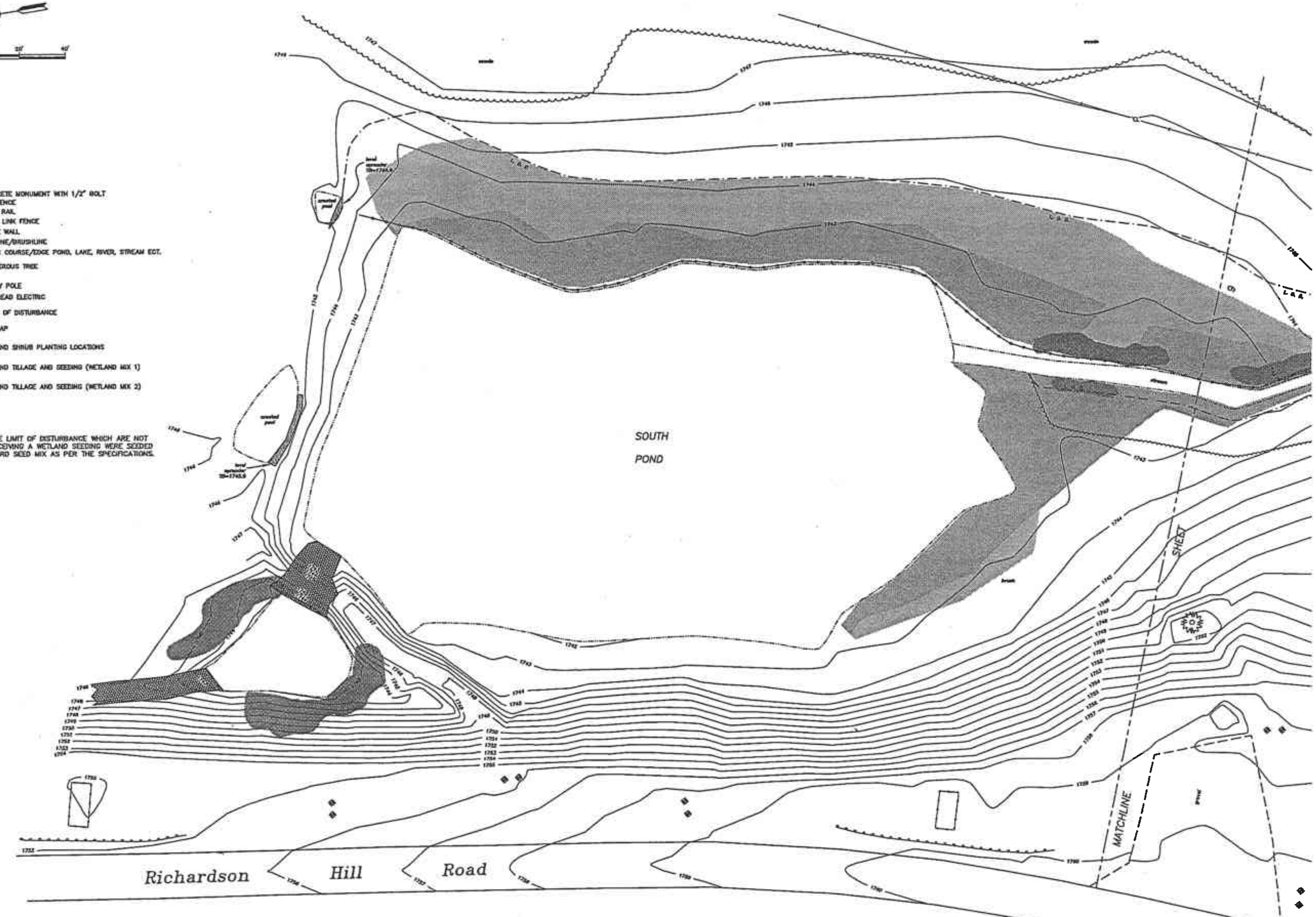

SITE PLAN

PLAN SCALE 1"=20'

1"=20' 20' 0 20' 40'

LEGEND

- CONCRETE MONUMENT WITH 1/2" BOLT
- SILT FENCE
- GUIDE RAIL
- CHAIN LINK FENCE
- STONE WALL
- TREELINE/BRUSHLINE
- WATER COURSE/EDGE POND, LAKE, RIVER, STREAM ECT.
- CONIFEROUS TREE
- UTILITY POLE
- OVERHEAD ELECTRIC
- L.O.D. LIMITS OF DISTURBANCE
- RIP-RAP
- WETLAND SHRUB PLANTING LOCATIONS
- WETLAND TILLAGE AND SEEDING (WETLAND MIX 1)
- WETLAND TILLAGE AND SEEDING (WETLAND MIX 2)

NOTE: AREAS WITHIN THE LIMIT OF DISTURBANCE WHICH ARE NOT IDENTIFIED AS RECEIVING A WETLAND SEEDING WERE SEEDED WITH THE STANDARD SEED MIX AS PER THE SPECIFICATIONS.

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COMPLETED CONSTRUCTION

Significant Construction Changes Are Shown

By ______ Date ______
Ch'd ______ Date ______

REVISIONS

AMPHENOL CORPORATION
HERRICK HOLLOW CREEK RESOTRATION
COMPLETED CONSTRUCTION DRAWINGS

AS-BUILT CONDITIONS (SHEET 8 OF 10)

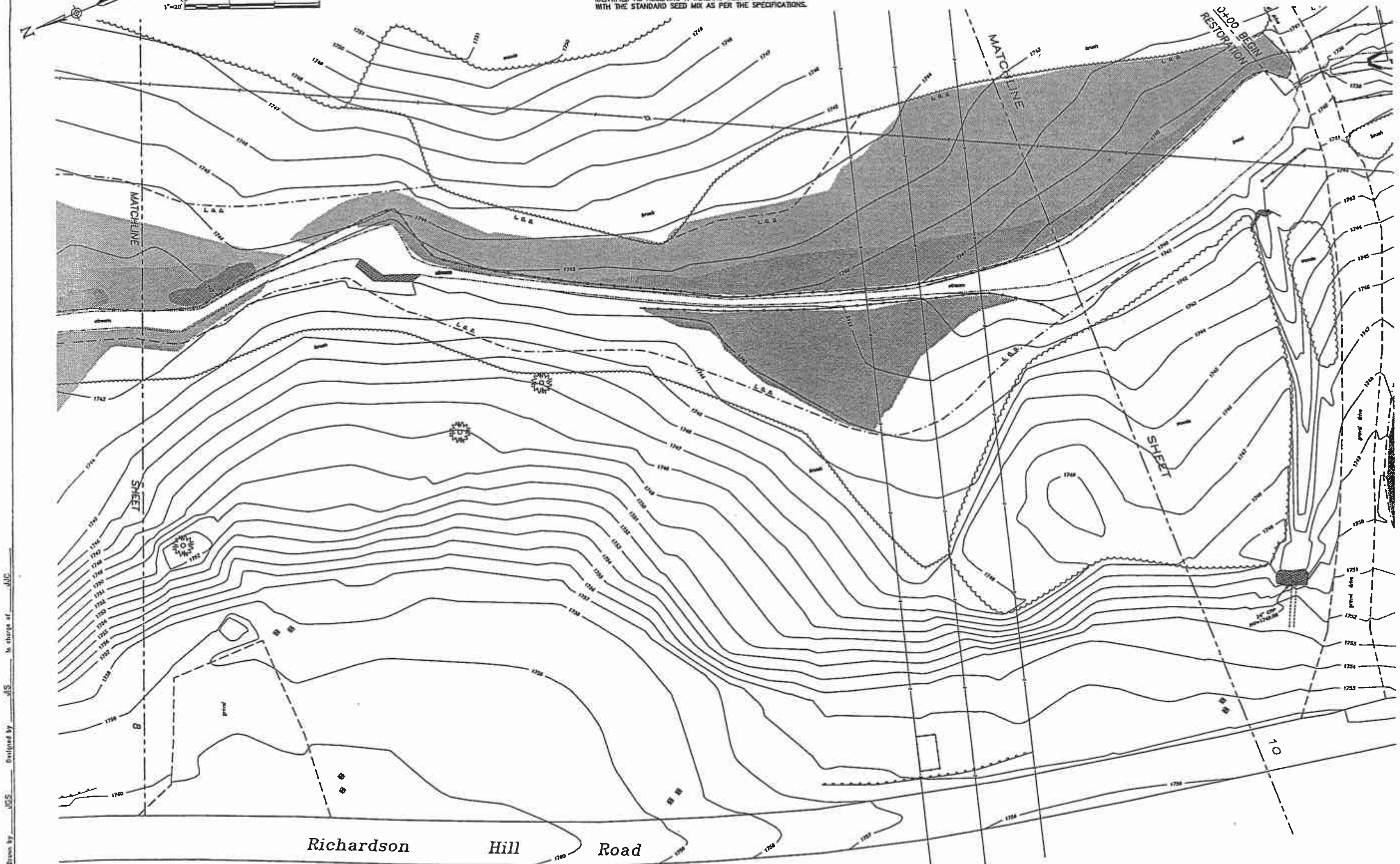
TOWN OF SIDNEY AND MASONVILLE DELAWARE COUNTY, NEW YORK

Barton & Loguidice, P.C.

DRAFT

Date	NOVEMBER, 2008
Scale	AS SHOWN
Sheet Number	8
File Number	824.006-09S

NOTE: AREAS WITHIN THE LIMIT OF DISTURBANCE WHICH ARE NOT IDENTIFIED AS RECEIVING A WETLAND SEEDING WERE SEEDED WITH THE STANDARD SEED MIX AS PER THE SPECIFICATIONS.



SITE PLAN

PLAN SCALE 1"=20'

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LEGEND

- CONCRETE MONUMENT WITH 1/2" BOLT
- SILT FENCE
- GUIDE RAIL
- CHAIN LINK FENCE
- STONE WALL
- TREELINE/BRUSHLINE
- WATER COURSE/EDGE POND, LAKE, RIVER, STREAM ECT.
- CONIFEROUS TREE
- UTILITY POLE
- OVERHEAD ELECTRIC
- L.O.D. LIMITS OF DISTURBANCE
- RIP-RAP
- WETLAND SHRUB PLANTING LOCATIONS
- WETLAND TILLAGE AND SEEDING (WETLAND MIX 1)
- WETLAND TILLAGE AND SEEDING (WETLAND MIX 2)

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COMPLETED CONSTRUCTION

Significant Construction Changes Are Shown

By____ Date____

Ck'd____ Date____

REVISIONS

AMPHENOL CORPORATION
HERRICK HOLLOW CREEK RESOTRATION
COMPLETED CONSTRUCTION DRAWINGS

AS-BUILT CONDITIONS (SHEET 9 OF 10)

TOWN OF SIDNEY AND MASONVILLE — DELAWARE COUNTY, NEW YORK

Barton & Loguidice, P.C.

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Date: NOVEMBER, 2008

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Sheet Number: 9

File Number: 824.006-10S

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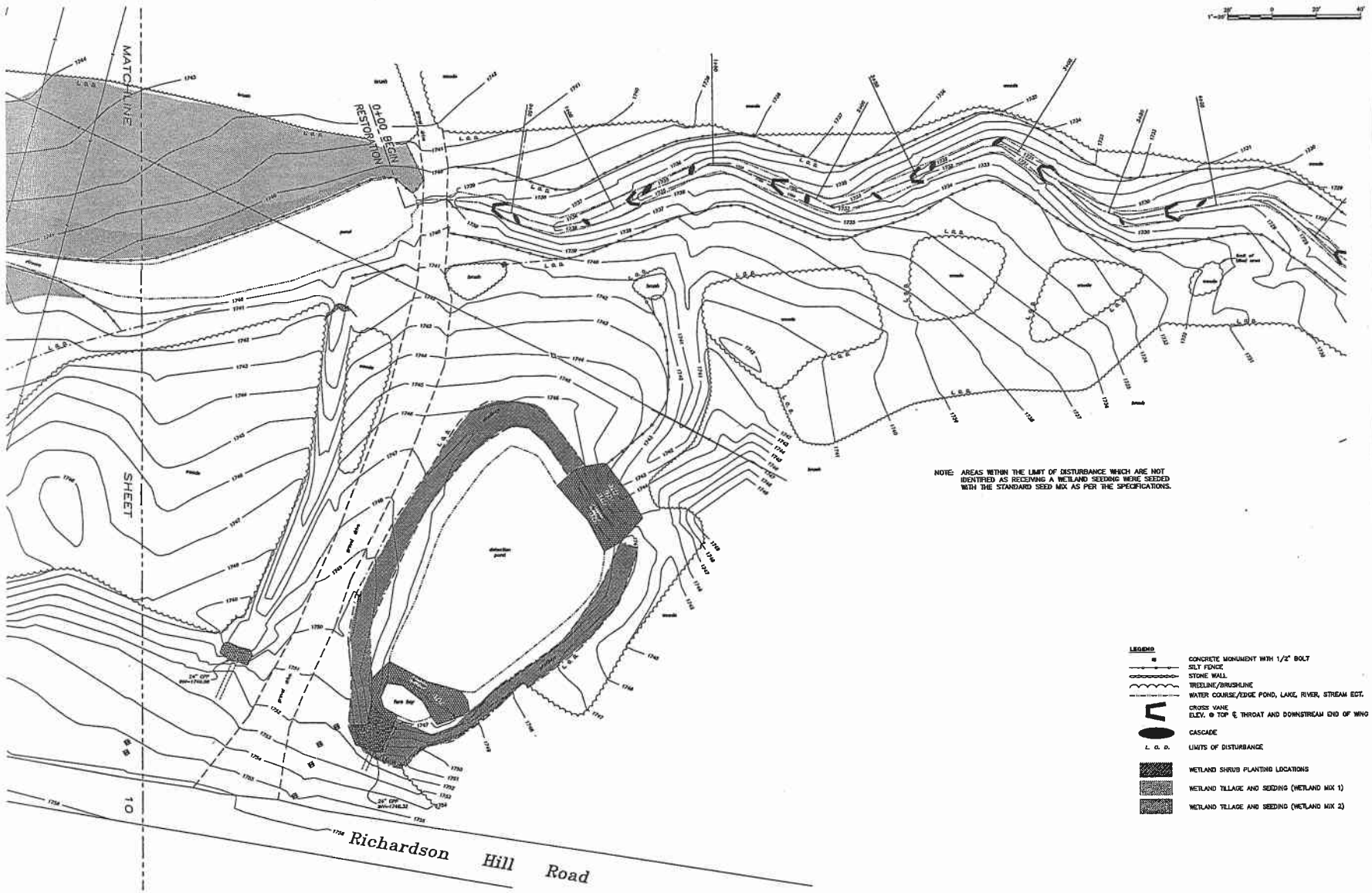

SITE PLAN
PLAN SCALE 1"=20'

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Significant Construction Changes Are Shown

By _____ Date _____

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REVISIONS

AMPHENOL CORPORATION
HERRICK HOLLOW CREEK RESOTRATION
COMPLETED CONSTRUCTION DRAWINGS

AS-BUILT CONDITIONS (SHEET 10 OF 10)

TOWN OF SIDNEY AND MASONVILLE — DELAWARE COUNTY, NEW YORK

Barton & Loguidice, P.C.

DRAFT

Date: NOVEMBER, 2008

Scale: AS SHOWN

Sheet Number: 10

File Number: 824.006-11S

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Drawn by _____ Designed by JDS In charge of JJS

Checked by _____

Appendix B

Photographs

1. Pre-construction view of stream Segment I. The channel is straightened and incised as a result of impaired morphology and repeated storm events.

2. Post-construction view of stream Segment I. Restored channel has ample floodplain access, appropriately sized bed material, and stable channel geometry based upon reference reach conditions.

3. Pre-construction view of stream Segment II. Channel is straightened, incised and entrenched due to impaired morphology subjected to a series of storm events.

4. Post-construction view of stream Segment II. Channel has ample floodplain access, and channel sinuosity has been restored to reflect stable reference reach conditions.

5. Pre-construction view of stream Segment III, indicating channel braiding due to deposition of sediment from upstream and a lack of bankfull capacity.

6. Post-construction view of stream Segment III. Increased bankfull cross-sectional area (derived from stable reference reach conditions) will allow for maintenance of flood flows without excessive sediment aggrading or channel braiding.

7. Step 1 of channel construction. Pump-around system was installed in a sump left at the end of the previous day's work, typically at a cross-vane structure. The entire downstream area to be constructed each day was dewatered.

8. Step 2 of channel construction. Sub-grades were excavated for the streambed and bank treatments downstream to the location of the next grade control structure to be built. Rough grades were dug with the excavator and fine-tuned by hand.

9. Step 3 - elevations of all sub-grades and structure footers were verified prior to continuation of the construction process.

10. Step 4 - rock cascades were constructed by hand in locations indicated in the design. Sub-grade and final elevations were verified with survey equipment prior to continuation of the construction sequence.

11. Step 5 - A footer was excavated at the location of each cross-vane and log vane as indicated in the design plans.

12. Step 6 - Gravel was placed to create a stable sub-grade for the placement of cross vane footer rocks. Gravel sub-grade was sloped so that footer and vane rocks would achieve the desired arm slope of 4% to 7% as indicated in the cross vane details and specifications.

13. Step 7 - Rocks used to construct cross vanes were installed with an excavator, and fine-tuned in place by hand. Use of a hydraulic thumb is paramount to successful cross vane construction.

14. Step 8 - Footer rocks were checked to ensure proper elevation, arm slope and arm angle was achieved prior to installing the vane (upper) tier of rocks.

15. Step 9 - Footer rocks were placed and backfilled.

16. Step 10 - Vane rocks were installed. Vane rocks are set back upon the footer rocks to prevent undercutting of the structure.

17. Step 11 - Constructed cross vanes were backfilled with soil and fine gravel.

18. Step 12 - Streambank treatments were installed up to and beyond the location of the completed cross vane. Coir logs were used along the stream banks, with coir mats and erosion control fabric installed across disturbed portions of the floodplain.

19. Step 13 - Finished stream bank and structure elevations were verified in the field prior to proceeding with the construction sequence.

20. Step 14 - Imported gravel material was mixed on-site and placed in the stream channel. Over time, response of the stream to flood events will progressively sort and distribute bed material in an appropriate manner.

21. Step 15 - At the end of each work day, the pump-around system was disabled, and flow retuned to the constructed channel. A sump hole was left at the downstream end of the last constructed cross vane to set the pump-around the following day.

22. Step 16 - The finished portion of the stream channel was hydroseeded.

23. Shrubs were planted in the riparian corridor in select areas.

24. Live stakes were installed in the riparian corridor along the entire course of the restored channel.

25. Level spreaders were constructed to maintain the hydrology needed to sustain existing wetlands adjacent to those areas disturbed during construction of the stream channel. Restored wetland areas were treated with peat and seeded with a wetland seed mix.

26. The existing stormwater detention basin near stream station 1+00 was converted to a micro-pool, greatly enhancing it's habitat value.

Appendix C

Daily Construction Inspection Reports

Barton & Loguidice, P.C.

Engineers • Environmental Scientists • Planners • Landscape Architects

Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	1
	Project No:	824.006
	Date:	7/8/08
	Day of the Week	
	S M T W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Partly cloudy in the PM. High in the mid 80's.	
Operators	2				
Laborers	3				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Honda Generator	1				
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

First day of construction, excavation begins at station 0+20. Cross vane at station 0+34 completed. Treatment 2 used to stabilize banks. Construction completed up to station 0+95. Constructed stream tied in to existing stream bed to allow for the continuation of flow.

Todd J. Phillips, Environmental Scientist II, Site Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	2
	Project No:	824.006
	Date:	7/9/08
	Day of the Week	
	S M T W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly cloudy in the AM. Mostly cloudy in the PM. High in the mid 80's.	
Operators	2	**TBG**			
Laborers	3	Inspector	1		
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Honda Generator	1				
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Begin construction at station 0+95. Two cascade structures completed at stations 0+53 and 0+84. Supply truck arrives, laborers needed to unload supplies. Finish treatment two on banks of constructed on 7/8. No new channel excavation occurs. Temporary spoils area constructed south of drainage swale. This area is then silt fenced.

Todd J. Phillips, Environmental Scientist II, Site Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	3
	Project No:	824.006
	Date:	7/10/08
	Day of the Week	
	S M T W **TH** F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly cloudy in the AM. Mostly cloudy in the PM. High in the mid 80's.	
Operators	2				
Laborers	3				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Honda Generator	1	500-gal. hydroseeder	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Supply truck arrives at 7:00 and is unloaded by laborers. Construction begins at 0+95. Cross vane constructed at station 0+99. Silt fence in staging area completed and is now ready to accept spoils. Excavation and placement of treatment 2 is performed up to station 1+63. Existing and newly constructed stream channels connected to allow for flow downstream.

Todd J. Phillips, Environmental Scientist II, Site Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	4
	Project No:	824.006
	Date:	7/11/08
	Day of the Week	
	S M T W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Cloudy with thunderstorms in the PM.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Construction left off at 1+63 on previous day. No new excavation takes place today. Cross vane at station 1+61 constructed. Hydroseeding of disturbed areas within stream corridor, as well as drainage swales is performed. The northern drainage swale that discharges roughly at station 0-20 is excavated and covered with the correct treatment.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**				Report No:	5		
Owner: **Amphenol Corp.**				Project No:	824.006		
Contractor: **DA Collins**				Date:	7/14/08		
				Day of the Week			
				S	M	T	W	TH	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Partly cloudy in the PM.	
Operators	2				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Honda Generator	1		1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Construction begins at station1+63. Excavation and placement of treatment 2 conducted up to station 2+23, end of construction. Cross vane constructed at 2+23. Cascades at stations 1+09, 1+32, 1+76, and 2+07 constructed. Spoils from excavation are being stored at a staging area that is silt fenced.

Todd J. Phillips, Environmental Scientist II, Site Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	6
	Project No:	824.006
	Date:	7/15/08
	Day of the Week	
	S M T W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Partly cloudy in the PM. Temp. in high 70's.	
Operators	2				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Honda Generator	1	Hilti	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Construction begins at 2+23. Cross vane constructed at station 2+83. Cascades constructed at 2+34 and 2+65. Construction of temporary road, leading from staging area to western bank, is completed. This will be removed when equipment no longer needs access to this area. Construction completed for the day at station 2+83.

Todd J. Phillips, Environmental Scientist II, Site Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**				Report No:	7		
Owner: **Amphenol Corp.**				Project No:	824.006		
Contractor: **DA Collins**				Date:	7/16/08		
				Day of the Week			
				S	M	T	W	TH	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Partly cloudy in the PM. Temp. in mid 80's.	
Operators	2				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Honda Generator	1	Hilti	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Construction begins at 2+83. Excavation and treatment 2 performed up to station 3+50. Cascade constructed at station 3+25 and cross vane at station 3+44.

Todd J. Phillips, Environmental Scientist II, Site Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	8
	Project No:	824.006
	Date:	7/17/08
	Day of the Week	
	S M T W **TH** F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Partly cloudy in the PM. Temp. in mid-80's.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Honda Generator	1	Hilti	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Construction begins at 3+50. Excavation of new channel and placement of treatment number 2 in specifications performed up to 4+50. Stream connected back to existing stream bed to allow for continued flow downstream. Cross vane completed at station 4+15 with cascades constructed at stations 3+58 and 3+90.

Todd J. Phillips, Environmental Scientist II, Site Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**				Report No:	9		
Owner: **Amphenol Corp.**				Project No:	824.006		
Contractor: **DA Collins**				Date:	7/18/08		
				Day of the Week			
				S	M	T	W	TH	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Partly cloudy in the PM. Extremely hot, high heat index, little wind, temp around 90F.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Honda Generator	1	Hilti	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Construction begins at 4+50. Excavation of new stream bed and specified treatment 2 placed on banks up to station 4+75. Construction of cross vane at station 4+75 and cascade at 4+59 completed. Treated banks and disturbed areas were hydro-seeded, approximately a 400-foot section. Track truck begins transporting spoils to new staging area south of Dimatos crossing. All silt fences closed for the weekend.

Todd J. Phillips, Environmental Scientist II, Site Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	10
	Project No:	824.006
	Date:	7/21/08
	Day of the Week	
	S M T W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Mostly cloudy in the PM.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Honda Generator	1	Hilti	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Construction begins at 4+75. Excavation of new stream bed and specified treatment 2 placed on banks up to station 5+38. Construction of cross vane at station 5+38, and cascades at 4+86 and 5+19 completed. Track truck continues transporting spoils to new staging area south of Dimatos crossing. Whirli bird seed thrower used to sew annual rye grass through out site.

Todd J. Phillips, Environmental Scientist II, Site Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No: 11
Owner: **Amphenol Corp.**	Project No: 824.006
Contractor: **DA Collins**	Date: 7/22/08
	Day of the Week

S	M	T	W	TH	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Cloudy with thunderstorms in the PM.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Construction begins at station 5+38. Threat of rain cancels in stream construction. Continue moving spoils from temporary staging area located next to drainage swale, to the next downstream staging area south of the Dimatos crossing. Silt fence begins to be placed along top of straw erosion control mats. Centerline of stream laid out for next 66-feet. Thunderstorm shuts down site for one hour, 2:30-3:30.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	12
	Project No:	824.006
	Date:	7/25/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Cloudy in the PM.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Setup of pump around starts at 7:00. No new construction performed. Previously constructed section between stations 3+50 and 4+15 discovered to have low elevations on bank full and bed. Measures taken to correct, all elevations as per plans now. Construction ends at 5:15.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	13
	Project No:	824.006
	Date:	7/28/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM. Cloudy in the PM. Light shower at 4:00.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:

Setup of pump around starts at 7:30. Excavation of new stream and placement of new stream bank treatment begins at 5+38, ending at 6+04. Sixty-six feet of station completed and approximately 75-feet of treatment placed. Cross vane constructed at Station 6+04. Cascades constructed at Stations 5+57 and 5+89. Silt fence reinstalled in areas that were removed in order to access site in morning.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	14
	Project No:	824.006
	Date:	7/29/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM with fog. Sunny in the PM.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1	Dump Truck	1		
Gas pump	1				

Description of Work Completed:

Setup of pump around starts at 7:00. New construction begins at Station 6+04. Approximately 80-feet of bank treatment placed, ending at Station 6+80. Silt fencing placed along entire edge of straw erosion control mat. Soil transferred from southern staging area to temporary area south of Dimatos crossing. Cascades constructed at Stations 6+13 and 6+44. Construction completed at 6:40.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	15
	Project No:	824.006
	Date:	7/31/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM with fog. Sunny in the PM.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1	Dump Truck	1		
Gas pump	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around functioning properly at 7:00. Depression addressed on west bank, fill added. Dimatos crossing blocks placed the previous day, 7/30, were removed to re-construct the bed of the crossing to conform to the proper grade. When it was determined that the additional bed material needed could not be scheduled for delivery until tomorrow the site was stabilized and connected to existing stream bed. Crossing and construction to be completed up to 7+50 tomorrow, 8/1.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	16
	Project No:	824.006
	Date:	8/1/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM with fog. Partly cloudy in the PM.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1	Dump Truck	1		
Gas pump	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around, functioning properly at 7:00. Grade set for crusher run base beneath pavers at Dimatos crossing. Crusher run placed and tamped with plate vibrator. Geotextile placed over crusher run base, pavers placed, crossing completed. New channel excavated downstream of crossing up to 7+40. Bank treatment 3 placed in newly constructed area. Bank treatments completed up to 6+50 hydroseeded. Connecting channel between existing and constructed stream stabilized for weekend.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	17					
	Project No:	824.006					
	Date:	8/4/08					
	Day of the Week						
	S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM with fog. Mostly sunny in the PM.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1	Dump Truck	1		
Gas pump	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around functioning properly at 7:00. Reconstruct cross vane at 6+04. Wait on correcting other cross vanes until proper rock arrives at site. Take corrective action on east bank by increasing grade and creating slight berm to concentrate flow towards stream, not away from stream, at Station 5+00 to roughly 6+00. B&L performs differential leveling of five cross sections. New cobble material begins to arrive, to be used as bed material in constructed stream.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**					Report No:	18		
Owner: **Amphenol Corp.**					Project No:	824.006		
Contractor: **DA Collins**					Date:	8/5/08		
					Day of the Week			
					S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly cloudy in the AM with fog. Mostly sunny in the PM.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1	Dump Truck	1		
Gas pump	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around functioning properly at 7:00. Grading of east bank completed between 5+50 and 7+00 as per comments by NYCDEP. Hydroseeded areas upslope of silt fencing on either bank. Level spreader constructed on east bank between stations 7+50 and 8+10. Quarry found that will cut rock to dimensions suitable, to begin delivery on Thursday afternoon. Cobble placed in portions of existing stream bed as per NYCDEP comments.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	19
	Project No:	824.006
	Date:	8/6/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Cloudy in the AM with slight mist. Sunny in the PM.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Gas pump	0	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around functioning properly at 7:00. Complete 10-feet of bank treatment three (double coir log) leading up to cross vane at Station 7+50, cross vane constructed. Complete 20-feet of single log treatment down stream of constructed cross vane. Construction ends at Station 7+70. CAT front end loader fixed by mechanic at 2:15. Lack of loader slowed progress.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No:	20					
Owner: **Amphenol Corp.**	Project No:	824.006					
Contractor: **DA Collins**	Date:	8/7/08					
	Day of the Week						
	S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Cloudy in the AM with slight mist. Cloudy in the PM, rain at 5:45.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around functioning properly at 7:00. Construction begins at 7+70. Construct cross vane at 7+84. Construct cascade at 8+10. Tilling test conducted with ripper attached to dozer. Area silt fenced where test conducted. Placement of bank treatment and grading of slopes up to 8+20. End of daily construction at 8+20 and offsite at 6:00.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**					Report No:	21	
Owner: **Amphenol Corp.**					Project No:	824.006	
Contractor: **DA Collins**					Date:	8/8/08	
					Day of the Week		
					S M T W T H F S		

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Cloudy in the AM, rain at 10:45. Cloudy in the PM.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Dozer with gripper	1
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around functioning properly at 7:00. Construction begins at 8+20. Construct cross vane at 8+24. Hydroseeded till test area. Placement of bank treatment and grading of slopes up to 8+42. Centerline stream staked out for next five structures, stakes marked for grade on next two structures. Made sure everything properly protected in case of weekend rain events. End of daily construction at 8+42 and offsite at 3:30. Precipitation and threat of thunderstorms slowed progress.

Todd J. Phillips, Environmental Scientist II, Inspector

Barton & Loguidice, P.C.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	22
	Project No:	824.006
	Date:	8/11/08
	Day of the Week	
	S M T W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Thunderstorms.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	1				
Gas pump	1				

Description of Work Completed:
No new construction completed due to thunderstorms.

Shaun P. McAdams, Environmental Scientist III, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No:	23
Owner: **Amphenol Corp.**	Project No:	824.006
Contractor: **DA Collins**	Date:	8/12/08
	Day of the Week	
	S M ■ W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Off and on rain showers throughout the day, heavy rain around noon.	
Operators	3				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Makita Generator	1		
Gas pump	1				

Description of Work Completed:

Constructed new stream channel from station 8+42 to Station 9+20 (cross vane). Constructed 78 feet of channel (station to station) including placement of coir logs and bank treatments, streambank grading, two cascades (at stations 8+54 and 8+88) and one cross vane (at station 9+13). Work was only slightly affected by rain showers.

Shaun P. McAdams, Environmental Scientist III, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No: 24
Owner: **Amphenol Corp.**	Project No: 824.006
Contractor: **DA Collins**	Date: 8/14/08
	Day of the Week

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly sunny all day.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around functioning properly at 7:20. Construction begins at 9+83. Construct cascade at 10+09. Construct cross vane at 10+27. Placement of bank treatments up to 10+67. Silt fence installed along western bank at edge of straw erosion control blanket. Rip rap outlet protection "C" on Richardson Hill Road completed. Centerline stream staked for next two structures. Total of 84-feet of station completed, ending at 10+67. Construction of cross vane at 10+67 to start work tomorrow.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	25
	Project No:	824.006
	Date:	8/15/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Mostly sunny all day.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around functioning properly at 7:20. Construction begins at 10+67. Construct cascade at 10+82. Construct cross vane at 10+67. Placement of bank treatments up to 11+14. Rip rap outlet protection "D" on Richardson Hill Road completed. Centerline stream staked for next two structures. Total of 47-feet of station completed, ending at 11+14. Hydroseeded areas disturbed by machines while constructing rip rap outlet protection.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	26
	Project No:	824.006
	Date:	8/16/08
	Day of the Week	

S	M	T	W	T H	F	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Mostly sunny all day, except for a rain shower from 2:30 to 3 pm.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Crew began work at 11+14, and continued to 11+53. Activities included construction of cross vane at 11+34, and construction of cascades at stations 11+18 and 11+53.Additional activities included placement of coir logs and bed gravel, bank grading, and installation of bank treatments from station 11+14 to station 11+53. Hydroseeding was done from station 9+50 (transition of upland to wetland mix) upstream to approx. 7+50. A portion of the work crew (2 operators and 1 laborer) continued work on the roadway outfall protection along Richardson Hill Rd. The day's effort resulted in the completion of 39 feet (station to station) of restored stream channel.
The weather had no deleterious effect on the day's work.

Shaun McAdams, Environmental Scientist III, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	27
	Project No:	824.006
	Date:	8/18/08
	Day of the Week	
	S M T W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly sunny all day, no rain.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dozer w/ ripper (Idle)	1		
Hilti	1				

Description of Work Completed:

On site at 7:15. Pump around set up and functioning properly. Construction begins at Station 11+53. Cascade at Stations 11+91 and 12+27 constructed, as well as cross vane at Station 12+13. Silt fence extended along top edge of bank treatment on western bank. Completed 100-feet of coir log, secured and anchored, ending at Station 12+50. Coir and straw mat bank treatment completed up to 12+27, with temporary measures incorporated to Station 12+50. Work completed at 5:45.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	28
	Project No:	824.006
	Date:	8/19/08
	Day of the Week	
	S M ▮ W T H F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Intermittent rain in the a.m., Sunny and clear in the afternoon.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Crew began work at 12+50, and continued to 13+20. Activities included construction of cross vanes at 12+50 and 12+86.Additional activities included placement of coir logs and bed gravel, bank grading, and installation of bank treatments from station 12+50 to station 13+20. Hydroseeding was done at all areas disturbed during construction of the Richardson Hill Road cross-pipe outlets. Construction of all roadway culvert outlets was completed. The day's effort resulted in the completion of 70 feet (station to station) of restored stream channel. Channel alignment was staked out down to station 14+00
The weather had no impact on the day's work.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No: 29
Owner: **Amphenol Corp.**	Project No: 824.006
Contractor: **DA Collins**	Date: 8/20/08
	Day of the Week

S	M	T	■	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Sunny and clear all day	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Crew began work at 13+20, and continued to 13+80. Activities included construction of cross vanes at 13+38 and 13+58. One cascade was also constructed at station 13+70. Additional activities included placement of coir logs and bed gravel, bank grading, and installation of bank treatments from station 13+20 to station 13+80. Two operators spend the day replenishing the soil (fill) stockpile in the vicinity of station 14+00. The day's effort resulted in the completion of 60 feet (station to station) of restored stream channel. Channel alignment was staked out down to station 15+50.
The weather had no impact on the day's work.

Shaun McAdams, Environmental Scientist III, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	30
	Project No:	824.006
	Date:	8/21/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Mostly sunny all day.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	2
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Setup of pump around functioning properly at 7:00. Construction begins at Station 13+80. Constructed cross vane at 14+00, cascade at 14+40, and cross vane at 14+81. Coir logs set and anchored up to 14+81, along with cobble material for bed. Coir mats and straw erosion control mats placed along entire constructed stream bank. Completely finished up to 14+40. Mats needs to be sewn in to coir logs from 14+40 to 14+81. Work completed at 14+81, 101-feet of Station.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**					Report No:	31	
Owner: **Amphenol Corp.**					Project No:	824.006	
Contractor: **DA Collins**					Date:	8/22/08	
					Day of the Week		
					S M T W T H F S		

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Mostly sunny all day.	
Operators	4				
Laborers	4,	5th arrived at noon			
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	2
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:00. Construction begins at 14+81. Centerline of stream laid out to 17+73. Silt fence installed along west bank at top of straw erosion mat. Cascade constructed at 15+26. Cross vane constructed at 15+46. Logs anchored and set up to 15+46 with bed material placed in channel. 65-feet of Station completed, 80-feet of log laid. Construction ends and offsite at 5:00.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	32
	Project No:	824.006
	Date:	8/25/08
	Day of the Week	
	S M T W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Cloudy with light rain in early AM. Mostly sunny during the PM.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dozer w/ ripper (Idle)	1		
Hilti	1	500-gal. hydroseeder	1		

Description of Work Completed:

On site at 7:30. Pump around set up and functioning properly. Construction begins at Station 16+10. Cross vane at 16+18 constructed. Cascades at Stations 16+50 and 16+87 constructed. Silt fence extended along top edge of bank treatment on western bank. Completed 100-feet of coir log (secured and anchored) and grading ending at 16+95, equating to roughly 85-feet of Station. Coir and straw mat bank treatment completed up to 16+50, with temporary measures incorporated to Station 16+95. Channel lined with cobble bed material. Work completed at 5:00.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No: 33
Owner: **Amphenol Corp.**	Project No: 824.006
Contractor: **DA Collins**	Date: 8/28/08
	Day of the Week

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Mostly sunny all day.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	2
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:45. Construction begins at 18+60. Constructed cross vane at 18+88. Constructed cascades at 19+08 and 19+50. Coir logs placed and secured up to 19+50. Bank treatment completed up to 19+00, temporary placement of coir and straw erosion control mats up to 19+50. Silt fence placed on west bank of constructed stream corridor. Cobble placed in in constructed stream up to 19+50. Minor amount of tilling performed on east side of South Pond to prep for seeding at later date. Silt fence placed around disturbed areas. Removal of access road begins at Station 17+50 working upstream ending at 14+75. Spoils removed and placed in designated area north of construction trailers near treatment facility. Construction ends at Station 19+50 with 90-feet of Station and roughly 88-feet of treatment with three structures completed. Offsite at 5:15.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	34
	Project No:	824.006
	Date:	9/2/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Sunny all day.	
Operators	4				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:15. Construction begins at 19+95. Cross vane constructed at 20+00. Log vane constructed at 20+17. Tilling completed on east side of South Pond downstream to 0+00, disturbed area completely silt fenced. Logs placed and secured up to 20+50. Cobble material placed in bed with bank treatments completed up to 20+17, with temporary rolling out of bank treatment down to 20+50.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	35
	Project No:	824.006
	Date:	9/3/08
	Day of the Week	
	S M T W T H F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Sunny all day.	
Operators	4				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:15. Construction begins at 20+50. Cross vane constructed at 20+00. Log vane constructed at 20+77, 21+35. Tilling begins on west side of South Pond downstream to 0+00, disturbed area completely silt fenced. Logs placed and secured up to 21+75. Cobble material placed in bed with bank treatments completed up to 21+75.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	36
	Project No:	824.006
	Date:	9/5/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Sunny all day, hot.	
Operators	4				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 6X6	
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:15. Construction begins at Station 22+78. Level spreader between Stations 23+00 and 23+55 on east side of stream constructed. Peat spread and incorporated into soil on east bank around South Pond. 20-feet of bank treatment placed, with silt fencing constructed on west and east bank in disturbed areas. Cobble material placed in bed. Temporary coir log and wood logs placed at connection to existing stream bed in case of heavy rain over the weekend, offsite at 3:30.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No: 37
Owner: **Amphenol Corp.**	Project No: 824.006
Contractor: **DA Collins**	Date: 9/8/08
	Day of the Week

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Sunny all day.	
Operators	4				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:10. Construction begins at Station 22+98. No damage to stream from rain event on Saturday, rain was steady but not heavy. Construct log vane 23+06 and 23+64. Construct level spreader on west bank at 23+00. All bank treatment completed up to 23+64. Silt fence installed along both east and west bank where soil was disturbed. Cobble material placed in stream bed. Removal of access road continues in a downstream fashion. 80-feet of log and two structures place over 66-feet of station. Offsite at 6:00.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No: 38
Owner: **Amphenol Corp.**	Project No: 824.006
Contractor: **DA Collins**	Date: 9/10/08
	Day of the Week

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	. Sunny all day.	
Operators	4				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:30. Construction begins at Station 22+64. Log vanes at 23+84, 24+50, and 25+26 installed. Coir logs secured up to 25+26. Bank treatment completed with silt fence on west bank. Treatment temporarily put in place on east bank, to be sewn in first thing on Thursday. Cobble placed in bed up to 25+26. Modifications to stormwater basin begins. Total of 162-feet of station constructed with three structures. Offsite at 5:45.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	39
	Project No:	824.006
	Date:	9/11/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	.	
Operators	4			Sunny all day.	
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:30. Construction begins at Station 25+26. Log vanes at 25+60, 26+00, and 26+15 installed. Coir logs secured up to 26+74, log vane to be built tomorrow. Coir mats sewn in up to 26+50. Treatment temporarily put in place on banks, to be stapled tomorrow with silt fencing. Cobble placed in bed up to 26+74. Modifications to stormwater basin continues. Constructed level spreader at 26+00 on east bank. Total of 148-feet of station constructed (170-feet of actual coir log placed) with three structures. Offsite at 5:30.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	40
	Project No:	824.006
	Date:	9/12/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Light rain from 9:30 on.	
Operators	4				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:30. Construction begins at Station 26+74. Log vanes at 26+74, 27+00, and 27+28 installed. All bank treatment, silt fence and cobble placed/secured up to 27+53. Modifications to stormwater basin continues. Total of 79-feet of station constructed, with three structures. Offsite at 4:00.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No:	41
Owner: **Amphenol Corp.**	Project No:	824.006
Contractor: **DA Collins**	Date:	9/13/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Cloudy all day.	
Operators	4				
Laborers	6				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:45. Construction begins at Station 27+53. Log vanes at 27+84 and 28+43 installed. All bank treatment, silt fence and cobble placed/secured up to 28+53. Modifications to stormwater basin continues. Total of 100-feet of station constructed, with two structures, ending at 28+53. Offsite at 3:00.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	42
	Project No:	824.006
	Date:	9/15/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly sunny all day.	
Operators	4				
Laborers	6				
Foreman	1				

Equipment:					
Link Belt Hoe	1	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:15. Construction begins at Station 28+53. Log vanes at 29+00, 29+50, and 29+96 installed. Coir logs placed and secured up to 30+00. All bank treatment and silt fence completed up to 30+00 on east bank. Treatment on west bank temporarily laid out, sewn up to 29+50, with silt fence placed in heavily disturbed areas. Cobble placed up to 30+00. Modifications to stormwater basin continue. Total of 147-feet of station constructed (180-feet of actual coir log placed), with three structures, ending at 30+00. Offsite at 5:30.

Todd J. Phillips, Environmental Scientist II, Inspector

Barton & Loguidice, P.C.

Engineers • Environmental Scientists • Planners • Landscape Architects

Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**				Report No:	43		
Owner: **Amphenol Corp.**				Project No:	824.006		
Contractor: **DA Collins**				Date:	9/16/08		
				Day of the Week			
				S	M	T	W	TH	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Partly sunny all day.	
Operators	4				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dozer w/ ripper	1		
Hilti	2	Kubota 4X4	1		

Description of Work Completed:

On site at 7:30, construction begins at Station 30+00. Pump around set up and functioning properly. Constructed level spreader around 30+25 on east bank. Log vane at 30+86 constructed. Placement of bank treatments completed up to 30+96. Channel lined with cobble bed material. All tilling on east bank completed. Stormwater basin almost completed, minor grading and treatment remaining. Work completed at 4:15.

Todd J. Phillips, Environmental Scientist II, Inspector

Barton & Loguidice, P.C.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	44
	Project No:	824.006
	Date:	9/17/08
	Day of the Week	
	S M T W TH F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Sunny all day.	
Operators	4				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1		
CAT Loader	1	Level and Rod	1		
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dozer w/ ripper	1		
Hilti	2	Kubota 4X4	1		

Description of Work Completed:

On site at 7:20, construction begins at Station 30+96. Pump around set up and functioning properly. Log vanes constructed at 31+22, 31+50, and 31+94. Placement of bank treatments completed up to 32+00. Channel lined with cobble bed material. Channel reconnected to existing downstream segment. All stream restoration work completed. Earthwork related to grading wetland restoration area continues. Work completed at 5:45.

Shaun McAdams, Environmental Scientist III, Inspector

Barton & Loguidice, P.C.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**	Report No: 45
Owner: **Amphenol Corp.**	Project No: 824.006
Contractor: **DA Collins**	Date: 9/18/08
	Day of the Week

S	M	T	W	T H	F	S

Work Force:

DA Collins:		**Barton & Loguidice:**		**Weather:**
Supervisor	1	Inspector	1	Mostly sunny all day.
Operators	4			
Laborers	6			
Foreman	1			

Equipment:

Link Belt Hoe	2	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	2		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:30. Reconstruct cascades at 0+53, 0+84, and 1+09. Reconstruct cross vanes at 0+34 and 0+99. Constructed channel block across low spot in the floodplain on right (west) bank in vicinity of 7+75. Grading work associated with wetland restoration along access road continues.

Shaun McAdams, Environmental Scientist III, Inspector

Barton & Loguidice, P.C.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	46
	Project No:	824.006
	Date:	9/19/08
	Day of the Week	
	S M T W T H F S	

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly sunny all day.	
Operators	4				
Laborers	6				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	2		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:15. Reconstruct cascades at 1+32, 1+76, 2+07, and 2+34. Reconstruct cross vanes at 1+61 and 2+23. Shrub pits dug for scheduled plantings on east side of South Pond. Access road removal continues. Offsite at 4:00.

Joe Damrath and two other DEP employees onsite at 11:00.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	47
	Project No:	824.006
	Date:	9/20/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly sunny all day.	
Operators	4				
Laborers	5				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	2		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 8:00. Reconstruct cascade at 2+65. Reconstruct cross vane at 2+83. Level spreader A and B north of South Pond constructed. All shrubs planted on east side of South Pond. Shrub pits dug for scheduled plantings on west side of South Pond. Access road removal continues and completed today. Offsite at 3:30.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	48
	Project No:	824.006
	Date:	9/22/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly sunny all day.	
Operators	3				
Laborers	6				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:30. Reconstruct cascades at 3+25, 3+58, 3+90, and 4+29. Reconstruct cross vanes at 3+44 and 4+15. All shrubs planted on west side of South Pond. Grading of access road area continues. Offsite at 4:30.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	49
	Project No:	824.006
	Date:	9/23/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly sunny all day.	
Operators	3				
Laborers	6				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:30. Reconstruct cascades at 4+59, 4+86, and 5+19. Reconstruct cross vanes at 4+75 and 5+38. Areas north of 0+00 completely hydroseeded with winter rye. Grading of access road area continues. Offsite at 5:00.

Todd J. Phillips, Environmental Scientist II, Inspector

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration** Owner: **Amphenol Corp.** Contractor: **DA Collins**	Report No:	50
	Project No:	824.006
	Date:	9/24/08
	Day of the Week	

S	M	T	W	T H	F	S

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly sunny all day.	
Operators	3				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:30. Hydroseeding of disturbed areas continues. Grading and tilling of western slop continues. All plantings on stormwater basin completed, with topsoil and mulch added. All throat rocks roughed up. Offsite at 3:30.

Todd J. Phillips, Environmental Scientist II, Inspector

Barton & Loguidice, P.C.

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Inspectors Report

Project Name: **Herrick Hollow Creek Restoration**					Report No:	51	
Owner: **Amphenol Corp.**					Project No:	824.006	
Contractor: **DA Collins**					Date:	9/25/08	
					Day of the Week		
					S M T W **T H** F S		

Work Force:					
DA Collins:		**Barton & Loguidice:**		**Weather:**	
Supervisor	1	Inspector	1	Mostly sunny all day.	
Operators	3				
Laborers	7				
Foreman	1				

Equipment:					
Link Belt Hoe	2	Polaris Ranger	1	Hilti	1
CAT Loader	1	Level and Rod	1	Kubota 4x4	1
Track Truck	1	Honda Generator	1		
Elec. pump	2	Dump Truck	1		
Dozer with ripper	1	Smaller Link Belt Hoe	1		

Description of Work Completed:

Work begins at 7:30. Bank treatment on stormwater basin complete, all shrubs planted and hydroseeded. All bank treatment through out entire corridor is hydroseeded. All disturbed areas were spread with peat and incorporated into soil with hydroseed sprayed. Offsite at 3:30.

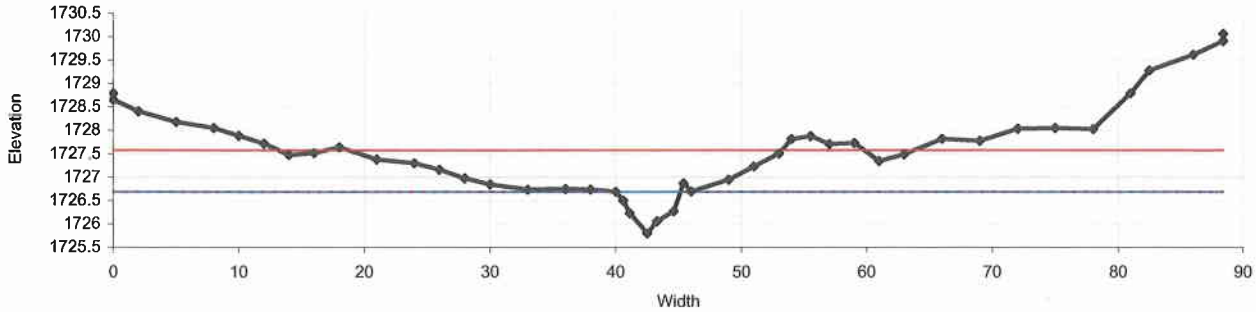
Todd J. Phillips, Environmental Scientist II, Inspector

Appendix D

Additional As-Built Data

Monumented Cross Sections

4 + 90 Herrick Hollow Creek - Segment I, Riffle



Bankfull Dimensions	
2.6	x-section area (ft.sq.)
5.2	width (ft)
0.5	mean depth (ft)
0.9	max depth (ft)
5.5	wetted parimeter (ft)
0.5	hyd radi (ft)
10.3	width-depth ratio

Flood Dimensions	
42.4	W flood prone area (ft)
8.2	entrenchment ratio
0.9	low bank height (ft)
1.0	low bank height ratio

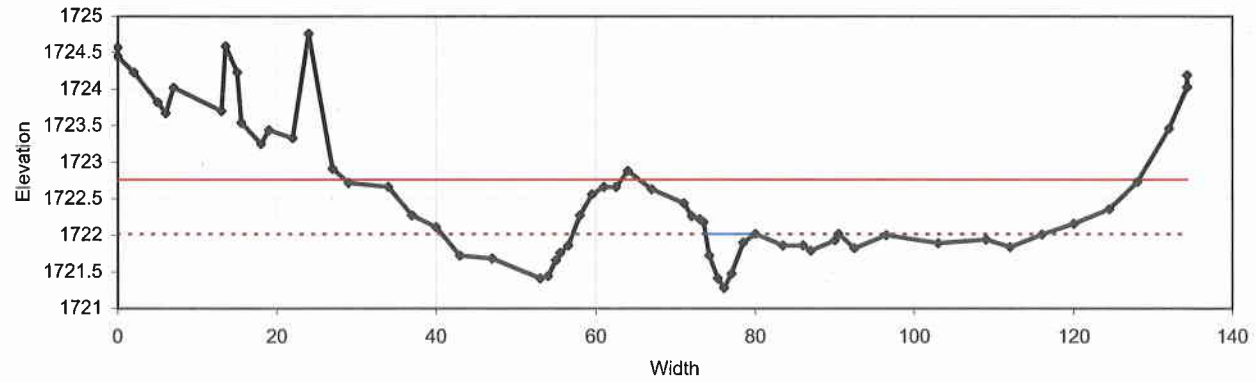
Materials	
38	D50 Channel (mm)
58	D84 Channel (mm)
39	threshold grain size (mm):

Bankfull Flow	
4.2	velocity (ft/s)
10.8	discharge rate (cfs)
1.09	Froude number

Flow Resistance	
0.035	Manning's roughness
0.18	D'Arcy-Weisbach fric.
5.6	resistance factor u/u*
2.6	relative roughness

Forces & Power	
2.7	channel slope (%)
0.79	shear stress (lb/sq.ft.)
0.64	shear velocity (ft/s)

6 + 93 Herrick Hollow Creek - Segment I, Riffle



Bankfull Dimensions	
2.3	x-section area (ft.sq.)
6.3	width (ft)
0.4	mean depth (ft)
0.7	max depth (ft)
6.5	wetted parimeter (ft)
0.4	hyd radi (ft)
17.2	width-depth ratio

Flood Dimensions	
97.3	W flood prone area (ft)
15.6	entrenchment ratio
0.7	low bank height (ft)
1.0	low bank height ratio

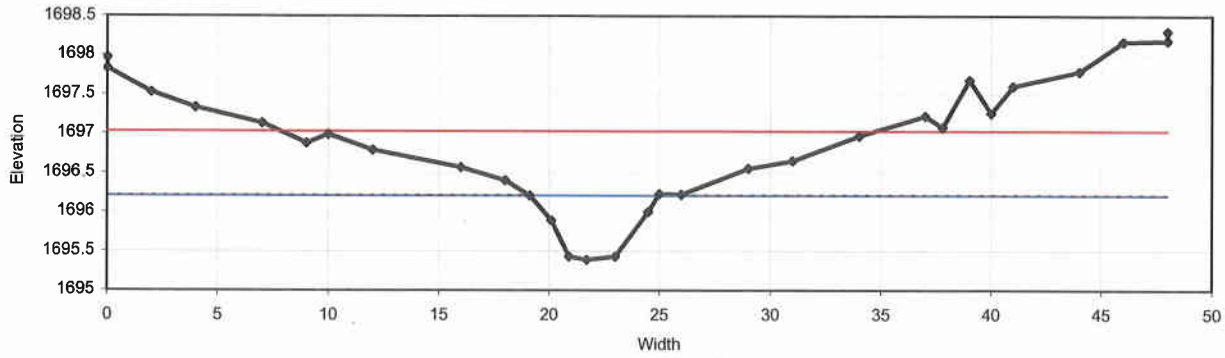
Materials	
38	D50 Channel (mm)
58	D84 Channel (mm)
29	threshold grain size (mm):

Bankfull Flow	
3.5	velocity (ft/s)
8.0	discharge rate (cfs)
1.04	Froude number

Flow Resistance	
0.035	Manning's roughness
0.20	D'Arcy-Weisbach fric.
5.0	resistance factor u/u*
1.9	relative roughness

Forces & Power	
2.7	channel slope (%)
0.59	shear stress (lb/sq.ft.)
0.55	shear velocity (ft/s)

12 + 72 Herrick Hollow Creek - Segment II, Riffle



Bankfull Dimensions	
3.1	x-section area (ft.sq.)
5.9	width (ft)
0.5	mean depth (ft)
0.8	max depth (ft)
6.2	wetted parimeter (ft)
0.5	hyd radi (ft)
11.2	width-depth ratio

Flood Dimensions	
26.9	W flood prone area (ft)
4.6	entrenchment ratio
0.8	low bank height (ft)
1.0	low bank height ratio

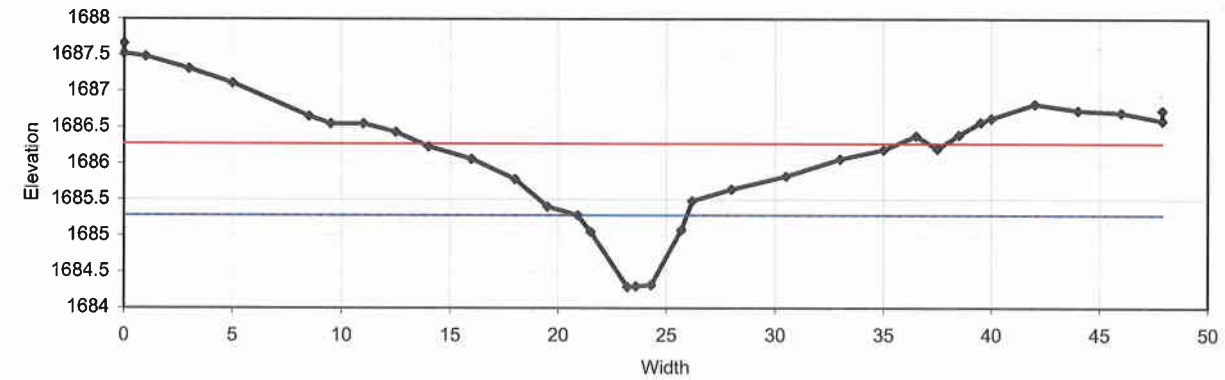
Materials	
54	D50 Channel (mm)
92	D84 Channel (mm)
56	threshold grain size (mm):

Bankfull Flow	
5.1	velocity (ft/s)
15.8	discharge rate (cfs)
1.28	Froude number

Flow Resistance	
0.035	Manning's roughness
0.18	D'Arcy-Weisbach fric.
4.5	resistance factor u/u*
1.7	relative roughness

Forces & Power	
3.7	channel slope (%)
1.15	shear stress (lb/sq.ft.)
0.77	shear velocity (ft/s)

15 + 21 Herrick Hollow Creek - Segment II, Riffle



Bankfull Dimensions	
3.0	x-section area (ft.sq.)
5.1	width (ft)
0.6	mean depth (ft)
1.0	max depth (ft)
5.5	wetted parimeter (ft)
0.5	hyd radi (ft)
8.5	width-depth ratio

Flood Dimensions	
22.7	W flood prone area (ft)
4.5	entrenchment ratio
1.0	low bank height (ft)
1.0	low bank height ratio

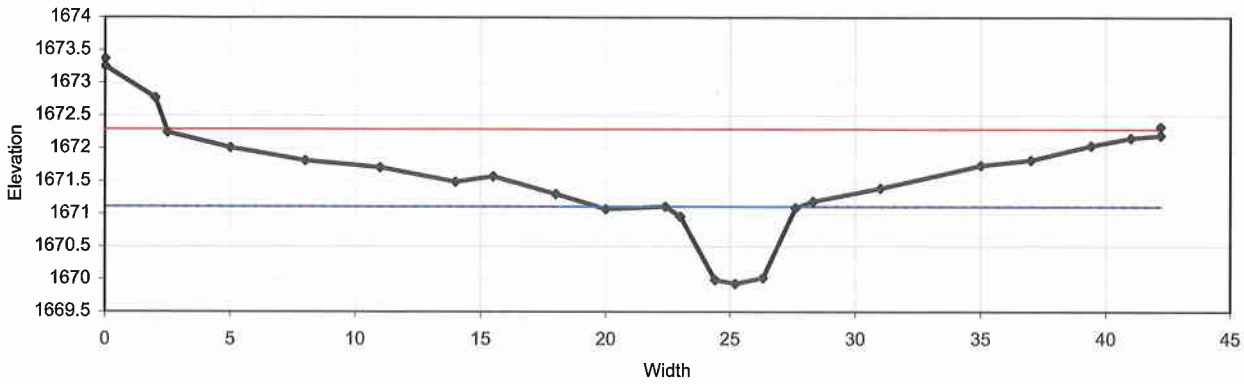
Materials	
54	D50 Channel (mm)
92	D84 Channel (mm)
62	threshold grain size (mm):

Bankfull Flow	
5.5	velocity (ft/s)
16.5	discharge rate (cfs)
1.31	Froude number

Flow Resistance	
0.035	Manning's roughness
0.17	D'Arcy-Weisbach fric.
4.8	resistance factor u/u*
2.0	relative roughness

Forces & Power	
3.7	channel slope (%)
1.26	shear stress (lb/sq.ft.)
0.81	shear velocity (ft/s)

19 + 99 Herrick Hollow Creek - Segment II, Riffle



Bankfull Dimensions	
3.9	x-section area (ft.sq.)
8.1	width (ft)
0.5	mean depth (ft)
1.2	max depth (ft)
8.8	wetted parimeter (ft)
0.4	hyd radi (ft)
16.9	width-depth ratio

Flood Dimensions	
39.7	W flood prone area (ft)
4.9	entrenchment ratio
1.2	low bank height (ft)
1.0	low bank height ratio

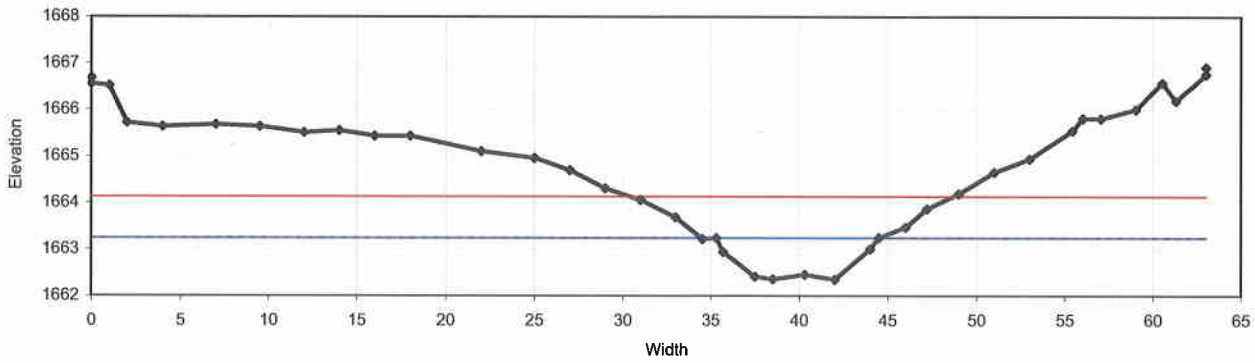
Materials	
54	D50 Channel (mm)
92	D84 Channel (mm)
50	threshold grain size (mm):

Bankfull Flow	
4.7	velocity (ft/s)
18.4	discharge rate (cfs)
1.26	Froude number

Flow Resistance	
0.035	Manning's roughness
0.19	D'Arcy-Weisbach fric.
4.6	resistance factor u/u*
1.6	relative roughness

Forces & Power	
3.7	channel slope (%)
1.02	shear stress (lb/sq.ft.)
0.72	shear velocity (ft/s)

22 + 25 Herrick Hollow Creek - Segment III, Riffle



Bankfull Dimensions	
6.1	x-section area (ft.sq.)
10.0	width (ft)
0.6	mean depth (ft)
0.9	max depth (ft)
10.4	wetted parimeter (ft)
0.6	hyd radi (ft)
16.6	width-depth ratio

Flood Dimensions	
18.2	W flood prone area (ft)
1.8	entrenchment ratio
0.9	low bank height (ft)
1.0	low bank height ratio

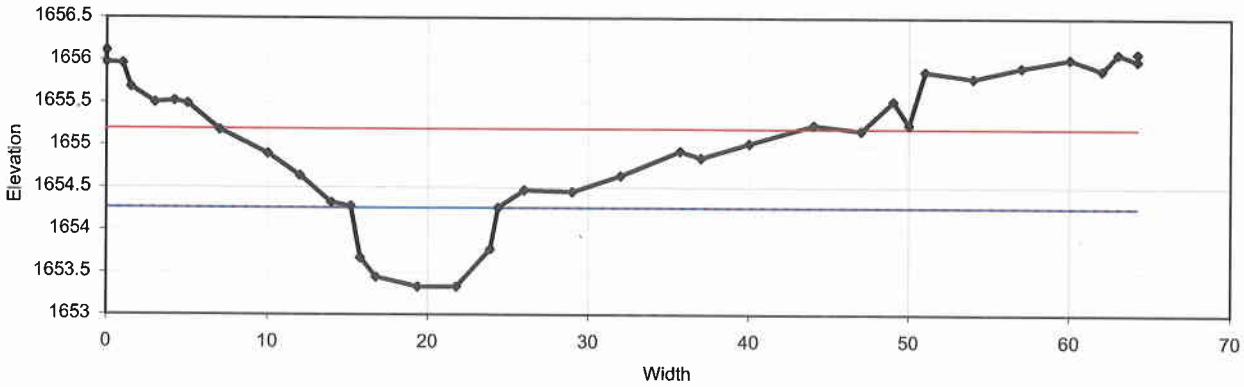
Materials	
44	D50 Channel (mm)
78	D84 Channel (mm)
25	threshold grain size (mm):

Bankfull Flow	
3.5	velocity (ft/s)
21.3	discharge rate (cfs)
0.81	Froude number

Flow Resistance	
0.035	Manning's roughness
0.17	D'Arcy-Weisbach fric.
5.3	resistance factor u/u*
2.4	relative roughness

Forces & Power	
1.4	channel slope (%)
0.51	shear stress (lb/sq.ft.)
0.51	shear velocity (ft/s)

28 + 25 Herrick Hollow Creek - Segment III, Riffle



Bankfull Dimensions	
7.0	x-section area (ft.sq.)
9.2	width (ft)
0.8	mean depth (ft)
0.9	max depth (ft)
9.7	wetted parimeter (ft)
0.7	hyd radi (ft)
12.0	width-depth ratio

Flood Dimensions	
37.1	W flood prone area (ft)
4.0	entrenchment ratio
0.9	low bank height (ft)
1.0	low bank height ratio

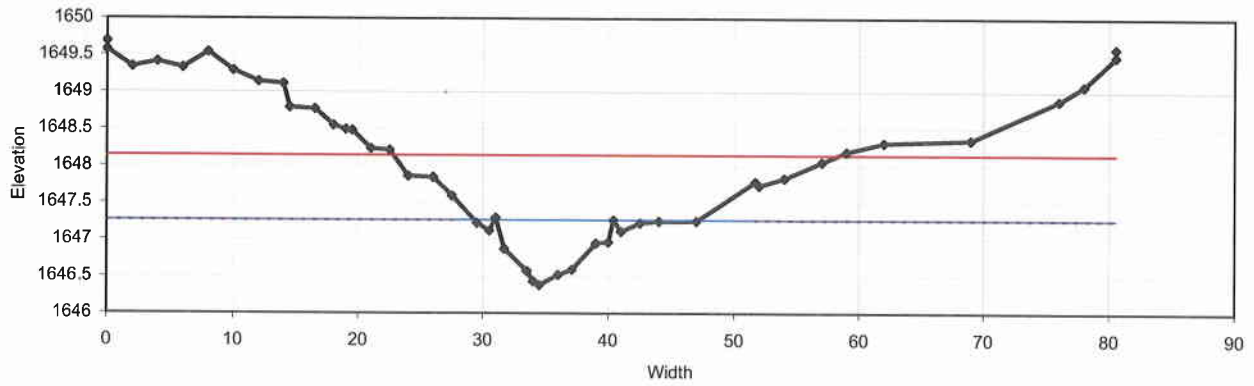
Materials	
44	D50 Channel (mm)
78	D84 Channel (mm)
31	threshold grain size (mm):

Bankfull Flow	
4.1	velocity (ft/s)
28.3	discharge rate (cfs)
0.84	Froude number

Flow Resistance	
0.035	Manning's roughness
0.16	D'Arcy-Weisbach fric.
5.7	resistance factor u/u*
3.0	relative roughness

Forces & Power	
1.4	channel slope (%)
0.63	shear stress (lb/sq.ft.)
0.57	shear velocity (ft/s)

32 + 81 Herrick Hollow Creek - Segment III, Riffle



Bankfull Dimensions	
5.6	x-section area (ft.sq.)
17.7	width (ft)
0.3	mean depth (ft)
0.9	max depth (ft)
18.0	wetted parimeter (ft)
0.3	hyd radi (ft)
56.0	width-depth ratio

Flood Dimensions	
35.5	W flood prone area (ft)
2.0	entrenchment ratio
0.9	low bank height (ft)
1.0	low bank height ratio

Materials	
44	D50 Channel (mm)
78	D84 Channel (mm)
13	threshold grain size (mm):

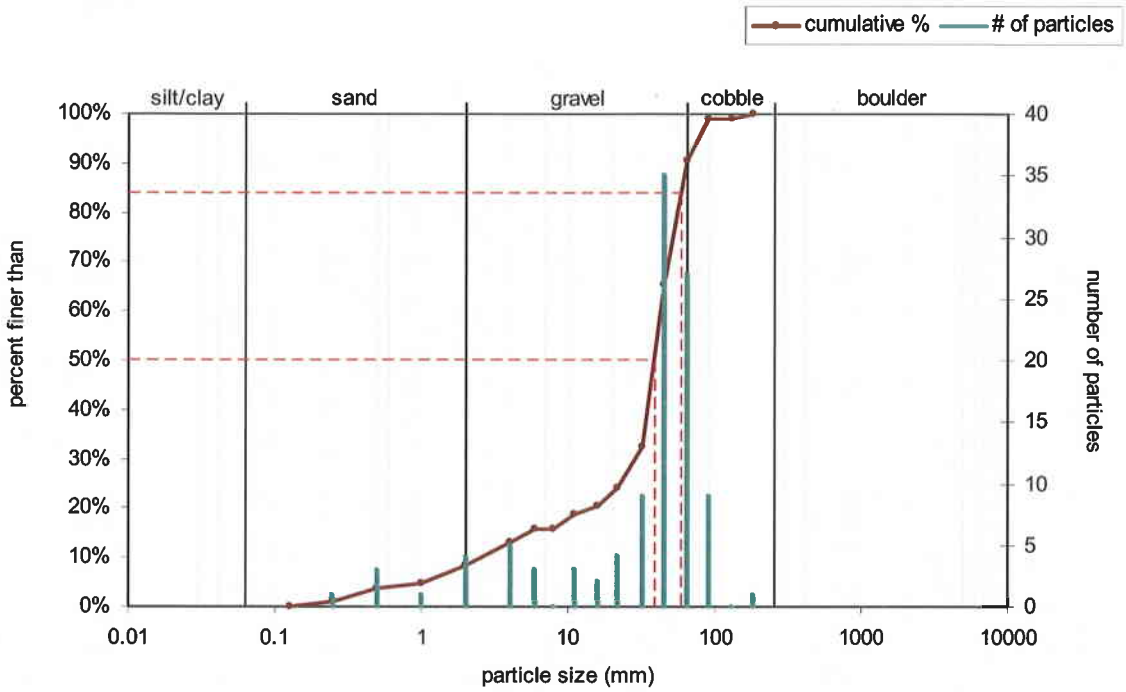
Bankfull Flow	
2.3	velocity (ft/s)
12.8	discharge rate (cfs)
0.73	Froude number

Flow Resistance	
0.035	Manning's roughness
0.21	D'Arcy-Weisbach fric.
4.2	resistance factor u/u*
1.2	relative roughness

Forces & Power	
1.4	channel slope (%)
0.27	shear stress (lb/sq.ft.)
0.37	shear velocity (ft/s)
---	unit strm power (lb/ft/s)

Results of Sediment Particle Distribution Analyses (Pebble Counts)

Bankfull Channel Pebble Count, Herrick Hollow Creek - Segment I



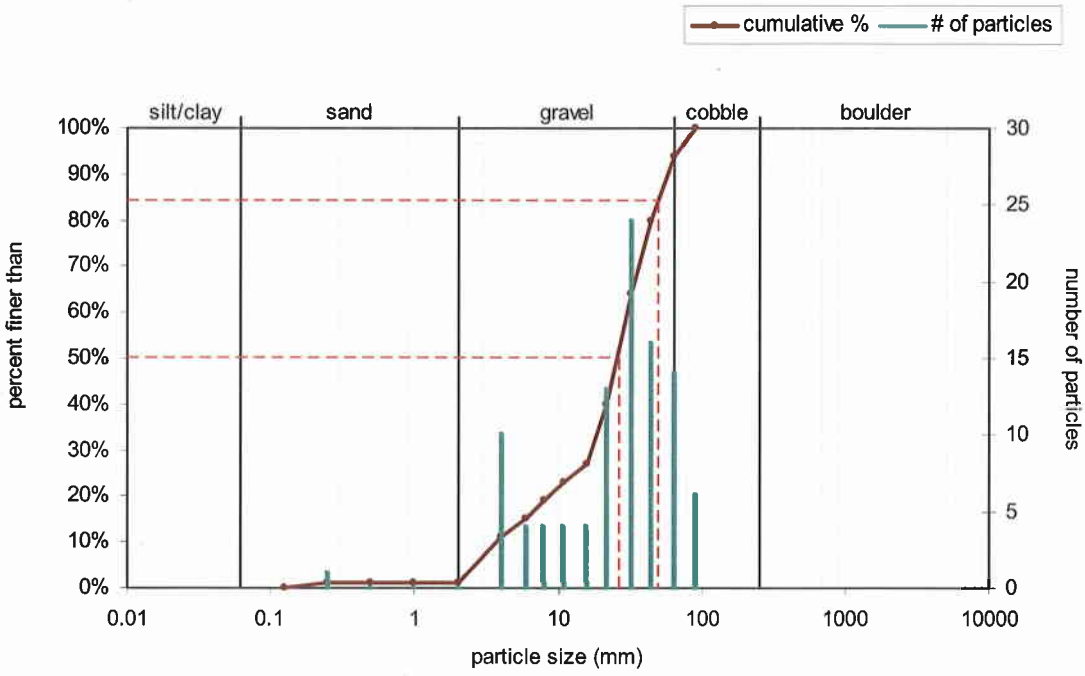
Size (mm)	
D16	8.1
D35	33
D50	38
D65	45
D84	58
D95	76

Size Distribution	
mean	21.7
dispersion	3.1
skewness	-0.26

Type	
silt/clay	0%
sand	8%
gravel	82%
cobble	9%
boulder	0%

Figure 2 - Substrate particle distribution at station 2+50 (Segment I) on October 22, 2008

Bankfull Channel Pebble Count, Herrick Hollow Creek - Segment I



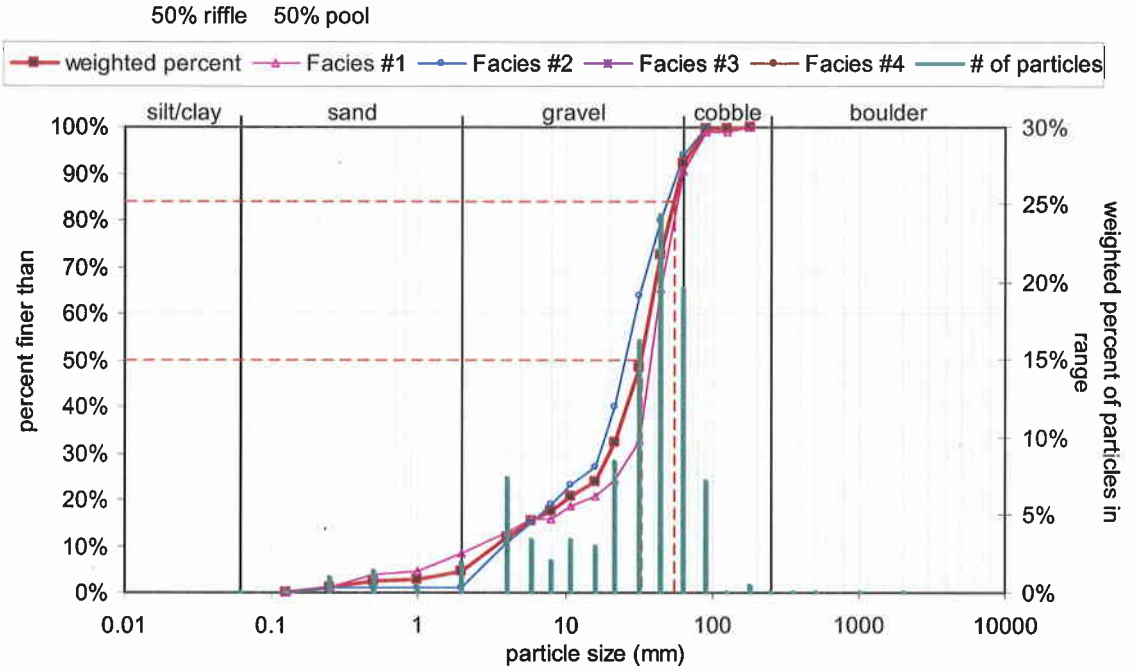
Size (mm)	
D16	6.4
D35	19
D50	26
D65	33
D84	50

Size Distribution	
mean	17.9
dispersion	3.0
skewness	-0.17

Type	
silt/clay	0%
sand	1%
gravel	93%
cobble	6%
boulder	0%

Figure 3 - Substrate particle distribution at station 5+50 (Segment I) on October 22, 2008

Weighted pebble count by channel facies Herrick Hollow Creek - Segment I



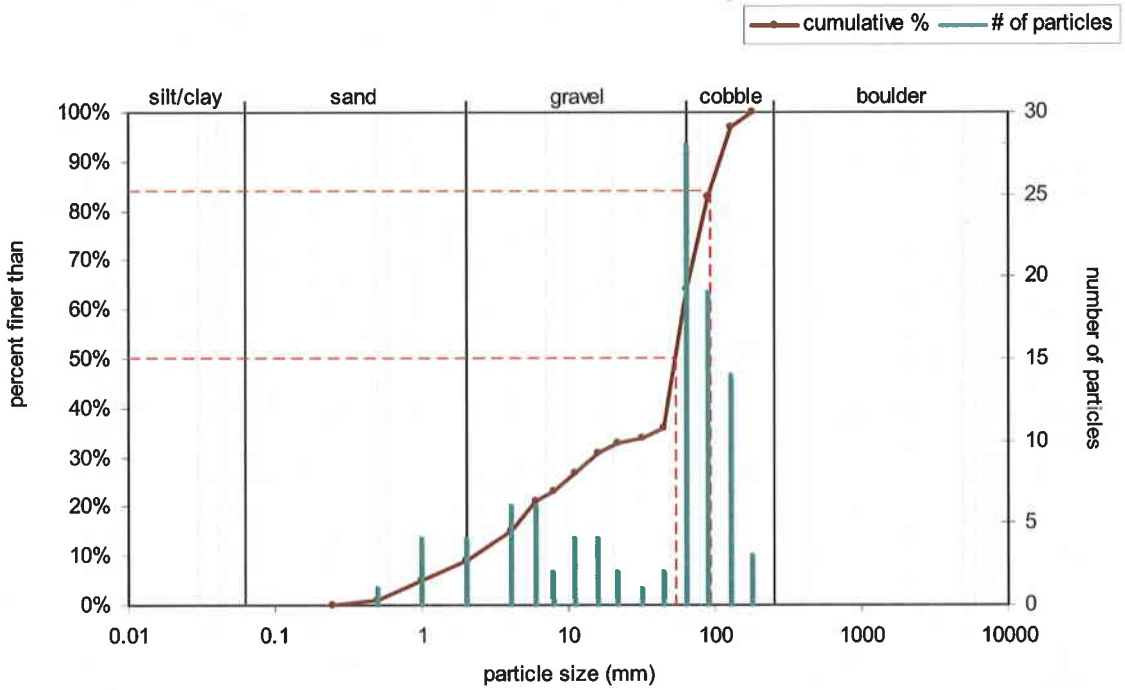
Size (mm)	
D16	6.5
D35	23
D50	33
D65	40
D84	55
D95	73

Size Distribution	
mean	18.9
dispersion	3.4
skewness	-0.25

Type	
silt/clay	0%
sand	5%
gravel	88%
cobble	8%
boulder	0%

Figure 4 - Cumulative (weighted) substrate particle distribution for Segment I on October 22, 2008

Bankfull Channel Pebble Count, Herrick Hollow Creek - Segment II



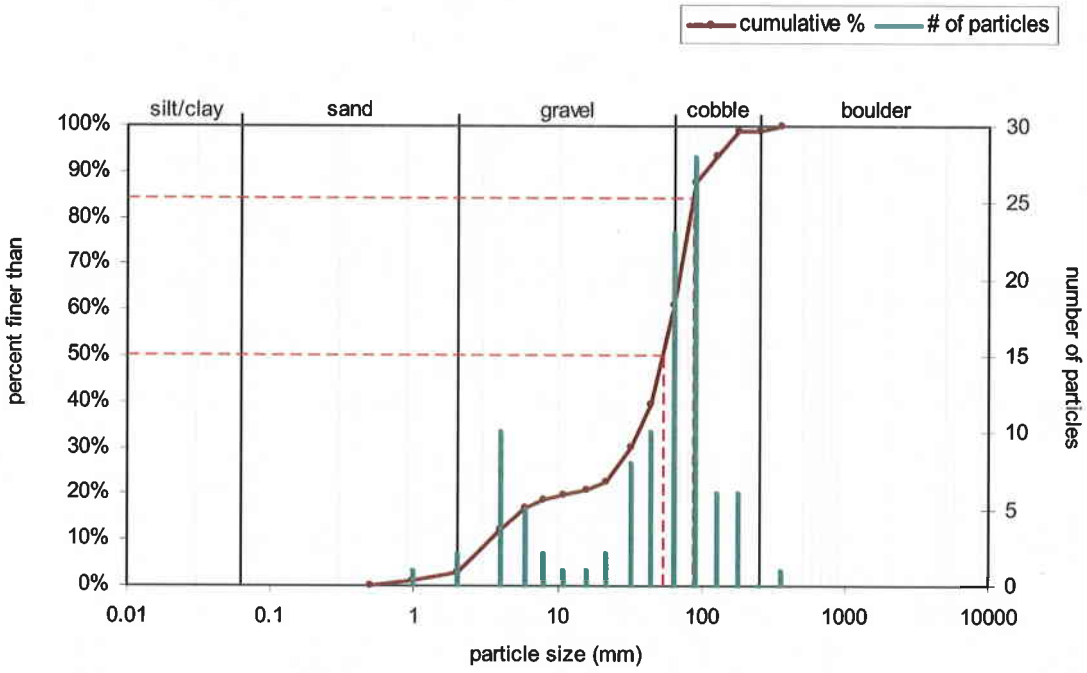
Size (mm)	
D16	4.3
D35	38
D50	54
D65	65
D84	92
D95	120

Size Distribution	
mean	19.9
dispersion	7.1
skewness	-0.38

Type	
silt/clay	0%
sand	9%
gravel	55%
cobble	36%
boulder	0%

Figure 5 - Substrate particle distribution at station 9+00 (Segment II) on October 22, 2008

Bankfull Channel Pebble Count, Herrick Hollow Creek - Segment II



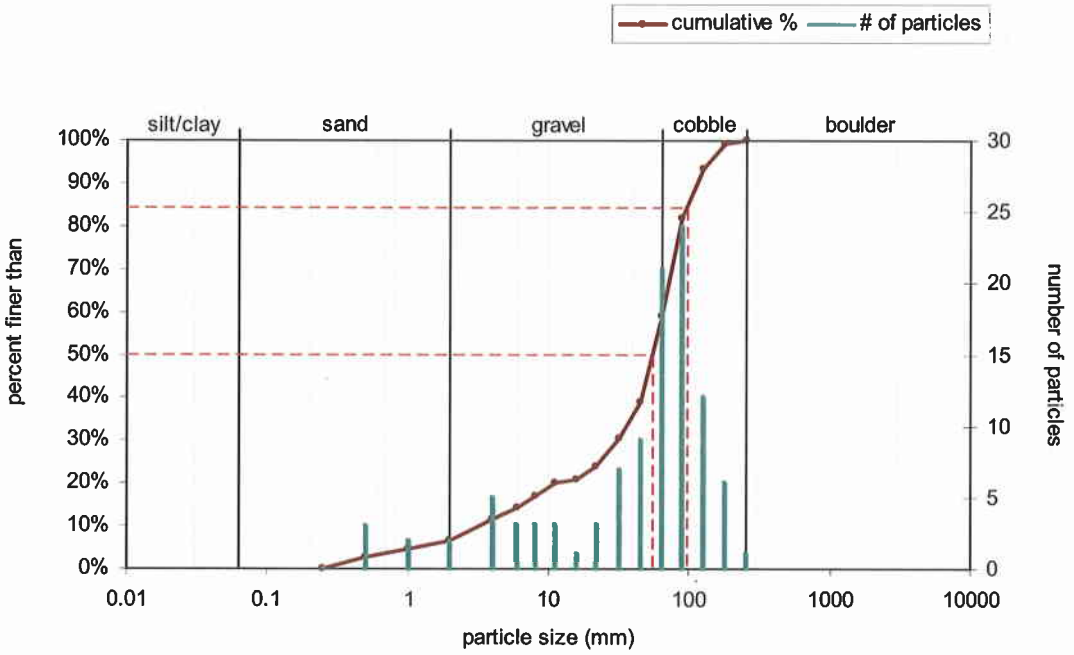
Size (mm)	
D16	5.5
D35	38
D50	53
D65	67
D84	86
D95	140

Size Distribution	
mean	21.7
dispersion	5.6
skewness	-0.35

Type	
silt/clay	0%
sand	3%
gravel	58%
cobble	38%
boulder	1%

Figure 6 - Substrate particle distribution at station 15+50 (Segment II) on October 22, 2008

Bankfull Channel Pebble Count, Herrick Hollow Creek - Segment II



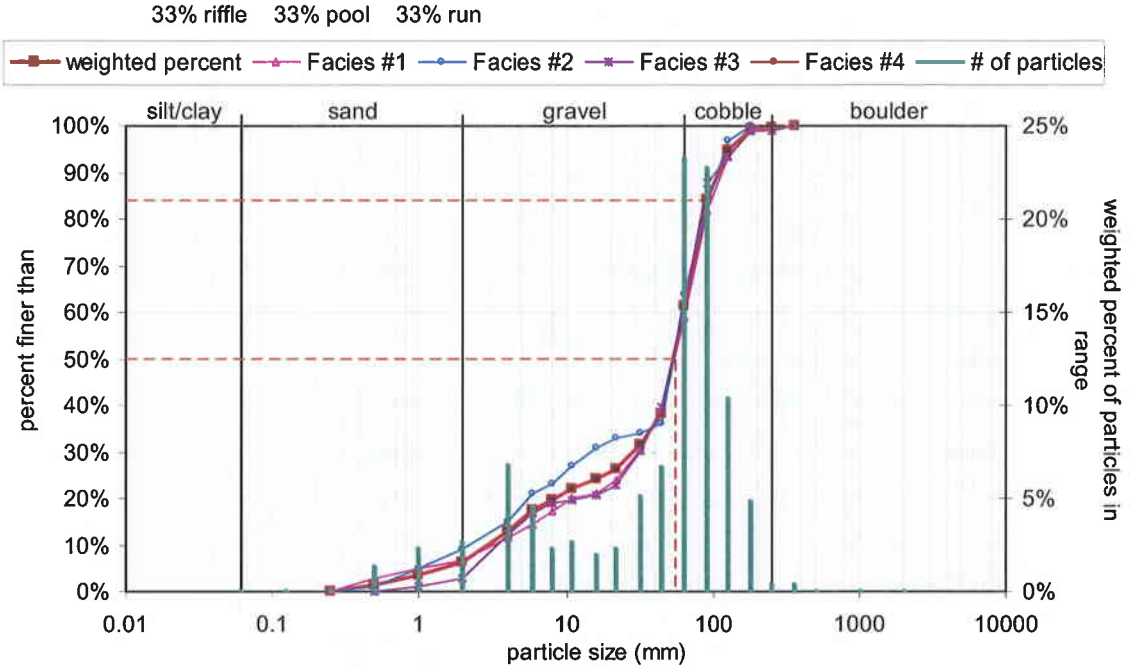
Size (mm)	
D16	7.1
D35	38
D50	55
D65	70
D84	96
D95	140

Size Distribution	
mean	26.1
dispersion	4.7
skewness	-0.30

Type	
silt/clay	0%
sand	7%
gravel	52%
cobble	41%
boulder	0%

Figure 7 - Substrate particle distribution at station 19+00 (Segment II) on October 22, 2008

Weighted pebble count by channel facies Herrick Hollow Creek - Segment II



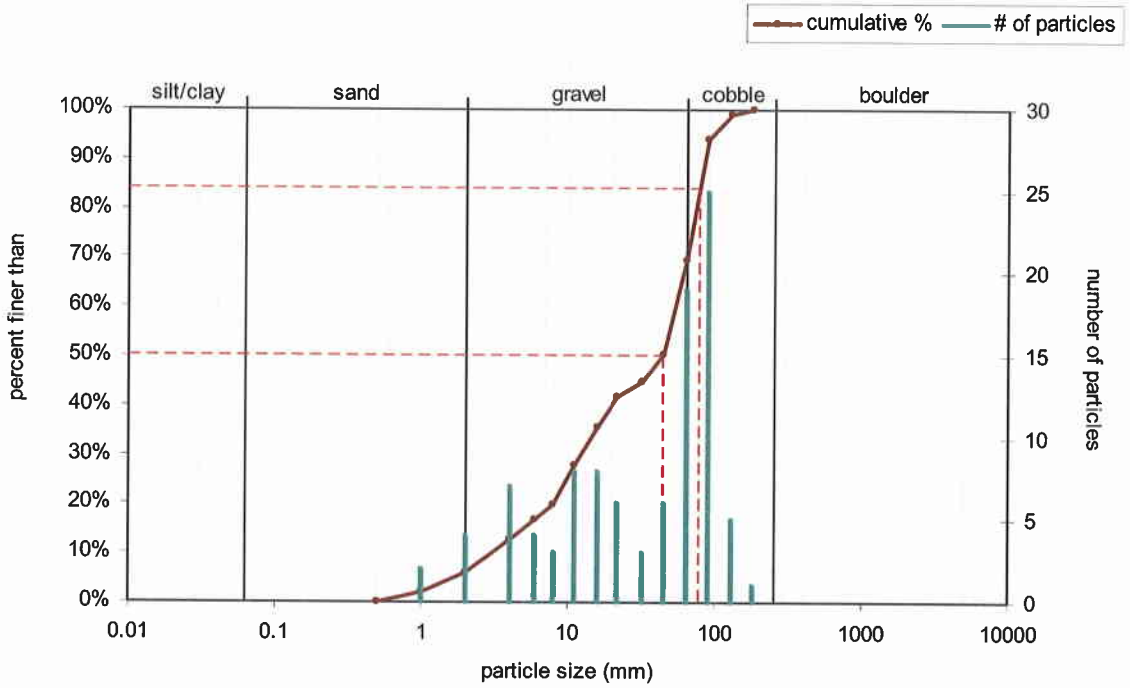
Size (mm)	
D16	5.3
D35	38
D50	54
D65	67
D84	90
D95	130

Size Distribution	
mean	21.8
dispersion	5.9
skewness	-0.35

Type	
silt/clay	0%
sand	6%
gravel	55%
cobble	38%
boulder	0%

Figure 8 - Cumulative (weighted) substrate particle distribution for Segment II on October 22, 2008

Bankfull Channel Pebble Count, Herrick Hollow Creek - Segment III

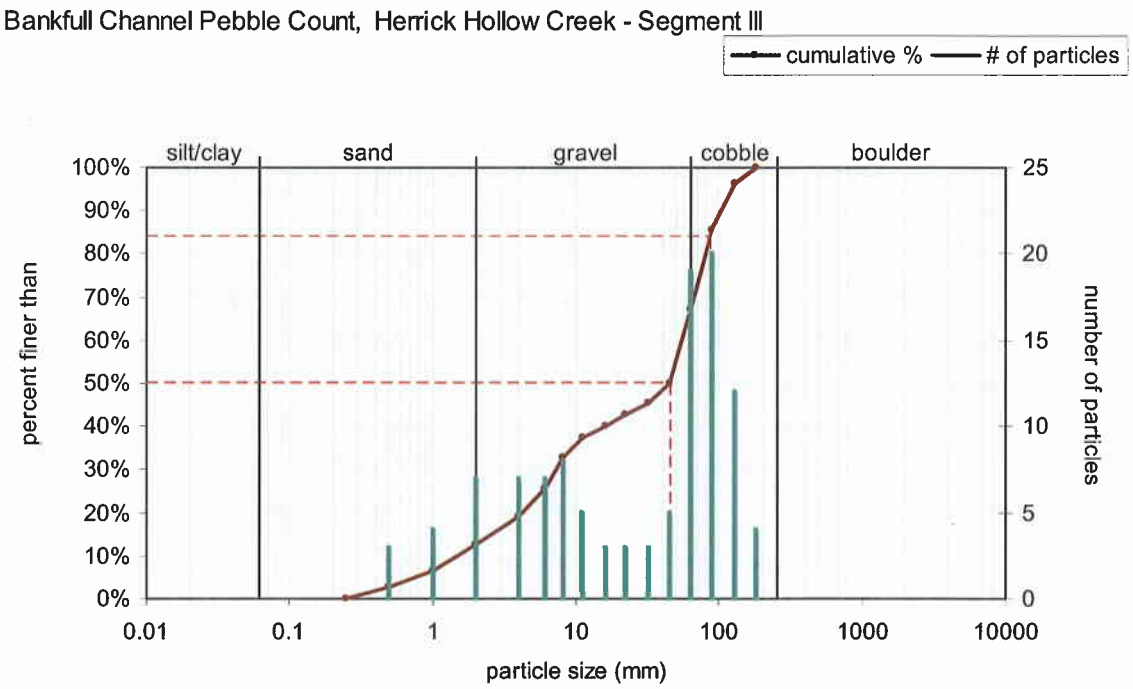


Size (mm)	
D16	5.5
D35	16
D50	44
D65	59
D84	78
D95	96

Size Distribution	
mean	20.7
dispersion	4.9
skewness	-0.30

Type	
silt/clay	0%
sand	6%
gravel	63%
cobble	31%
boulder	0%

Figure 9 - Substrate perticle distribution at station 21+50 (Segment III) on October 22, 2008



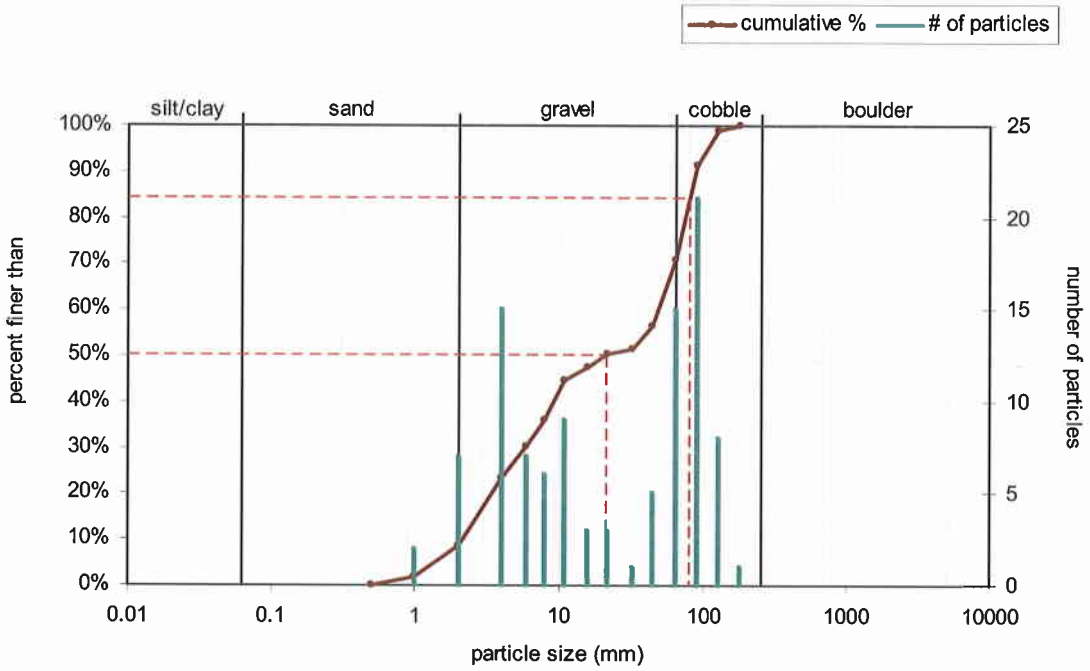
Size (mm)		
D16	2.9	3.4
D35	9.4	12
D50	45	17
D65	61	20
D84	88	29
D95	120	39

Size Distribution	
mean	16.0
dispersion	8.7
skewness	-0.37

Type	
silt/clay	0%
sand	13%
gravel	55%
cobble	33%
boulder	0%

Figure 10 - Substrate particle distribution at station 24+00 (Segment III) on October 22, 2008

Bankfull Channel Pebble Count, Herrick Hollow Creek - Segment III



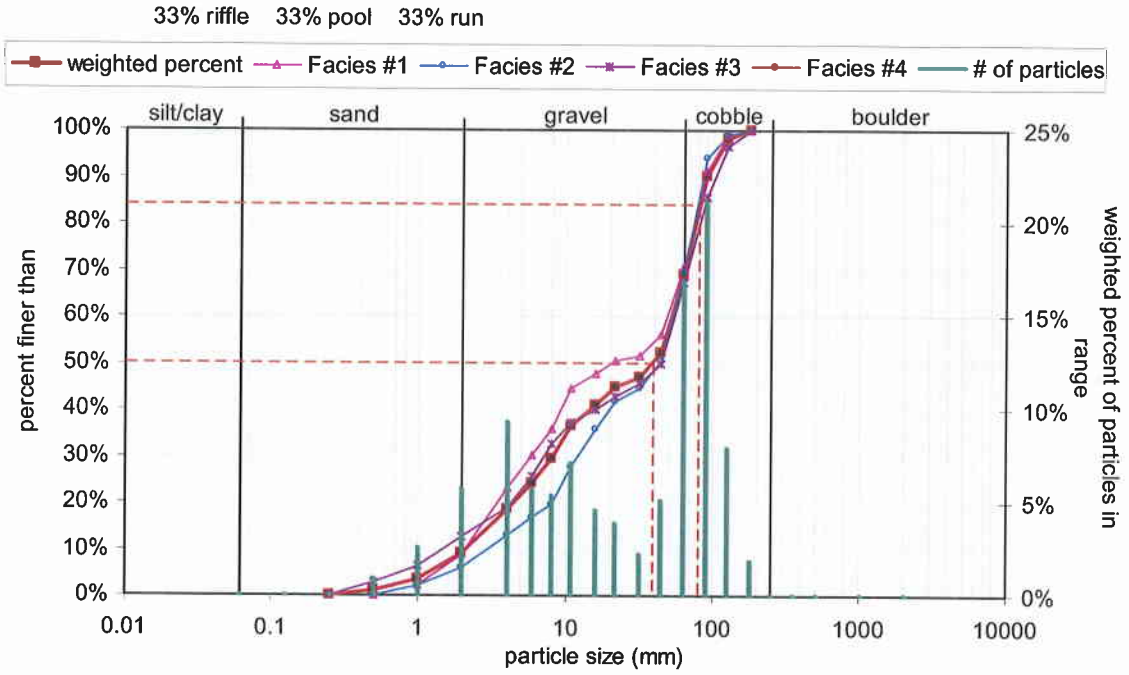
Size (mm)	
D16	2.8
D35	7.6
D50	21
D65	56
D84	80
D95	110

Size Distribution	
mean	15.0
dispersion	5.7
skewness	-0.12

Type	
silt/clay	0%
sand	9%
gravel	62%
cobble	29%
boulder	0%

Figure 11 - Substrate particle distribution at station 33+20 (Segment III) on October 22, 2008

Weighted pebble count by channel facies Herrick Hollow Creek - Segment III



Size (mm)	
D16	3.3
D35	10
D50	39
D65	59
D84	81
D95	110

Size Distribution	
mean	16.3
dispersion	6.9
skewness	-0.32

Type	
silt/clay	0%
sand	9%
gravel	60%
cobble	31%
boulder	0%

Figure 12 - Cumulative (weighted) substrate particle distribution for Segment III on October 22, 2008

Appendix E

Herrick Hollow Creek Post-Construction Monitoring Plan

Amphenol Corporation

Herrick Hollow Creek Restoration
Town of Masonville, Delaware County, New York

Herrick Hollow Creek Restoration
Post-Construction Monitoring Plan

March 2009

Barton & Loguidice, P.C.
Engineers • Environmental Scientists • Planners • Landscape Architects

290 Elwood Davis Road
Box 3107
Syracuse, New York 13220

Table of Contents

1.0 Introduction

The plan described in this document defines the monitoring elements for the reconstructed stream channel and the restored wetlands of Herrick Hollow Creek.

1.1 Stream Restoration Monitoring

For a natural stream channel restoration project like the Herrick Hollow Creek restoration, success can be measured by evaluating two general criteria: 1) success in achieving the overall project goals and objectives and 2) performance of the restored natural channel over time. Post-construction monitoring establishes baseline conditions against which future channel adjustment can be measured.

Natural stream channels are dynamic in nature. In the case of the Herrick Hollow Creek restoration project, the primary goal was to reconstruct the existing impaired stream channel to a pattern, dimension, and profile that would allow for the appropriate transport of water and sediment without significantly or rapidly aggrading or degrading in the short-term. Just the same, the restored channel, just as any stable channel in nature, is not a static system. A stream continually changes in width and depth as it adjusts to its sediment loads through periods of flood and low-flow, perpetually attempting to achieve quasi-equilibrium between channel form, hydraulics, sediment load, and sediment transport capability over time. In the case of this project, such adjustment is expected as the channel adjusts to the new pattern, dimension, profile, and sediment load imposed upon it by the design. The most evident adjustment will occur in response to the first few bankfull storm events to occur once construction is complete.

Establishment of a short-term monitoring plan (one or two years) implies that the channel, as constructed, exhibits the form and function that most closely approaches the equilibrium state (i.e., reflects the maximum stable condition). However, given the expected adjustment of the channel to storm events and the lack of established riparian vegetation immediately following construction, this is not the case. Evaluation of channel performance over a greater time period will allow for a clearer understanding of how the channel has adjusted to the form imposed upon it by the design and to subsequent storm events. Therefore, the monitoring period for this project will extend three years from the date of construction completion. A completed as-built survey will be used as a baseline for post-construction conditions at the site.

1.2 Restored Wetland Monitoring

The success of restored wetlands is expressed by the wetland functions they provide. Monitoring is necessary to document the condition and performance of the wetlands and to record the functionality of these wetlands.

Wetland restoration success is more slowly expressed than that of the associated stream restoration. Development of acceptable wetland vegetation and re-development of hydric soil conditions occur over a longer timeframe as compared to the stream restoration. As a result, the monitoring period selected for the wetland restoration component of this project is five years in length.

2.0 Schedule

2.1 Stream Monitoring

Post-construction monitoring will consist of six scheduled visits over the three year (36 month) period following construction. There will be three visits during the first 12 months (including an initial visit to collect as-built data), two visits during the second 12 month period (months 12-24 after construction), and one final inspection at the end of the 36 month period. Based upon a construction completion date of September 30, 2008, a tentative monitoring schedule will be as follows:

October 2008: *collect initial as-built data*
April 2009
September 2009
April 2010
September 2010
September 2011

In addition to the scheduled monitoring intervals, monitoring of the stream channel will also be conducted immediately following selected bankfull flow events that occur during the established monitoring period (October 2008 – September 2011). Because flood events of bankfull discharge or greater have the highest likelihood of altering stream channel or floodplain form and function, affecting instream structures, etc., it is important to observe and document responses of the channel to bankfull flows.

Historically, bankfull events have occurred on average every 1 to 1.5 years; therefore, this monitoring plan assumes three (3) additional monitoring

visits will be necessary over the three year lifespan of the post-construction monitoring program. The number of additional monitoring events may vary and is wholly dependent upon the frequency of such storms during the monitoring period, with the expectation of the monitoring period to include a minimum of 5 bankfull flows. In the case that excessively dry weather warrants the inclusion of additional monitoring visits in order to bring the number to five, these additional visits can be added to the monitoring term.

2.2 Wetland Monitoring

Monitoring will be conducted once a year for five years commencing in 2009 and concluding in 2014. This monitoring will be done in June of each year. Reports of the findings are to be submitted within 60 days of the completion of the monitoring. This monitoring schedule may be shortened if observed conditions indicate that the monitoring goals have been met prior to the end of the five year period. Should the wetland restoration areas not meet the established criteria at the end of the five year period, additional monitoring may be required.

3.0 Methodology

3.1 Stream Restoration

All components of the monitoring effort, including collection of field data, data analysis, and reporting will be conducted by a qualified professional familiar with this project, and with general fluvial geomorphology principles and practice. Performance of the restored stream channel over the post-construction monitoring period will be determined by the following field monitoring activities:

3.1.1 As-Built Survey

An as-built survey will be conducted in October 2008. Components of the as-built survey will include:

- A topographic survey of the post-construction channel corridor and adjacent floodplains and wetlands;
- Longitudinal profile of the constructed stream channel, including thalweg and bankfull elevations and channel planform (sinuosity);
- Location and elevation of all constructed instream structures (arm and throat elevations);
- Location and elevation of permanent monitoring monuments;
- Location and elevation of level spreaders; and

- Centerline stationing of channel components (structures, monitoring cross-sections, etc.) along the longitudinal profile of the stream.

During the as-built survey, the surveyor will establish a stationing system along the length of the stream corridor based upon stream centerline length. This will result in a stationing system that differs from the stationing previously established during the original construction of the stream prior to 2004, and has been utilized through design and construction (the original survey used for design and construction was based upon a north-south grid system). Due to the fact that the sinuosity of the restored channel (namely in Segments I and II) results in a significant difference between valley length and actual stream length, utilizing a stationing system based upon stream centerline through the term of the monitoring program will allow changes in the stream channel to be evaluated more accurately over time, because they will be based upon actual channel length and location (using centerline stationing), rather than overall valley length (using the original grid system).

The as-built survey will be used to generate a topographic map showing as-built site conditions. For the sake of replication, the surveyor will provide the monitoring team with station and elevation data for each data point surveyed. This data will be plotted using The Reference Reach Spreadsheet distributed by the Ohio Department of Natural Resources, Division of Soil and Water Conservation (available online at http://www.dnr.state.oh.us/soilandwater/water/streammorphology/default/tabid/9188/Default.aspx).

3.1.2 Survey of Monumented Cross-Sections

Survey of monumented cross-sections will be conducted during each monitoring visit. Permanent benchmark monuments will be established within the stream corridor at predetermined locations. Monuments will consist of a hole dug approximately 24" deep (typically using a common post-hole digger), filled with concrete. A 10" stove bolt is fixed into the hole, so that only the head and a small portion of the bolt stem are exposed above ground (just enough to attach a survey tape). Two monuments are set for each permanent cross-section to be surveyed. In all, eight permanent cross-sections will be established, with two cross-sections occurring in Segment I, three in Segment II, and three in Segment III. Permanent monitoring cross-sections will be located at the following stations:

Segment I	Segment II	Segment III
4+90	12+72	22+25
6+93	15+21	28+25
	19+99	32+81

The profile of the stream cross-section will be surveyed along a measuring tape extended between the two permanent monuments by transit-stadia survey. The tape can be attached to the monument pins using spring clamps or carabineers. Any variation in the length of the survey tape to result should be recorded in the survey notes and survey data will be adjusted accordingly. For the sake of replication, cross-section survey data will be collected starting at the left bank monument pin (station 0+00) and extending to the right bank monument pin. Along the cross-section, elevations will be collected incrementally to accurately

represent the actual profile between the monuments. Additionally, stations and elevations will be collected at each of the following features:

- Top of left monument pin
- Left terrace or floodplain bench
- Left top of bank
- Left bankfull
- Left edge of water
- Left bank toe
- Grade breaks across the streambed
- Thalweg
- Right toe of bank
- Right edge of water
- Right bankfull
- Right top of bank
- Right terrace or floodplain bench
- Top of right monument pin
- Any visible high water marks on either bank

The location and elevation of each permanent cross-section monument will be included in the project as-built survey. Cross-sections surveyed at each location will be plotted using The Reference Reach Spreadsheet (see reference above). Each cross-section will be compared to previous cross-sections as a means of evaluating changes in vertical stability (bed aggrading or degrading), bankfull channel geometry, and lateral channel migration over the term of the monitoring program. Photographs will be taken in the field, facing west from the east bank and east from the west bank, to provide visual evidence of conditions at each cross-section.

3.1.3 Survey of Longitudinal Profile

A longitudinal survey of the stream bed from stations 0+00 to 35+51 (terminus) will be constructed during each monitoring visit. Survey of the longitudinal channel profile from station 0+00 to station 35+51 will be used to evaluate the stability of instream structures, formation and maintenance of bed features, as any variation in channel or bed slope and downstream shifting of bed material to occur during the term of the monitoring period. Periodic evaluation of channel profile may indicate areas of channel aggradation or degradation.

The longitudinal bed profile will be evaluated by transit-stadia survey. Permanent monuments will be used to establish vertical survey control through the length of the restored channel to be surveyed. Stationing will be established by extending a measuring tape along the thalweg of the stream channel. The tape will be oriented so that the survey progresses from upstream to downstream. Station and elevation will be collected incrementally along the channel to reflect actual field conditions. Survey data collected will include the following:

- Left and right bankfull elevation, thalweg elevation, and water depth corresponding to each survey point (water depth is measured with the survey rod);
- The throat (channel bed invert) elevation of all instream structures;
- Bankfull elevation of all instream structures (point where structure arm meets the top of bank);

- Bankfull (both banks) and thalweg elevations corresponding to the items above;
- Bed (thalweg) elevation immediately upstream and downstream of each structure throat (scour holes associated with log vanes or cross vanes, for example); and
- Any distinct or abrupt changes in bed grade or slope.

Survey data collected from the longitudinal profile survey will be plotted using The Reference Reach Spreadsheet (see reference above). Comparison of subsequent longitudinal surveys will be used to evaluate stability of instream structures and the ability of the stream channel to mobilize, transport, and deposit sediments as a result of storm flows. The longitudinal survey will also be used to identify distinct bed (riffle/pool) features and evaluate their maintenance over time. The longitudinal survey will also establish elevations for each constructed structure (cross vane, cascade, and log vane) and compare subsequent surveys to the as-built elevation to evaluate any shifting or settling of structures over the term of the monitoring program.

3.1.4 Evaluation of Structure Condition

The restoration of Herrick Hollow Creek included the installation of 34 cross vanes, 44 cascades, and 26 log vanes. As a component of the post-construction monitoring effort, each structure will be inspected to evaluate their general condition and performance capability and to identify any changes to the orientation or configuration of the structures that may have occurred over time. Any evidence that the structure is not performing properly (side-washing, undermining, excessive sediment

aggrading or degrading, etc.) will also be noted. Photographs will be taken to provide evidence of structure condition and performance.

3.1.5 Pebble Counts

Substrate particle distribution will be evaluated by collecting pebble count data at nine locations along the restored reach. During each monitoring visit, eight pebble counts will be collected; one in the vicinity of the following stations:

Segment I	Segment II	Segment III
2+50	9+00	21+50
5+50	15+50	24+00
	19+00	30+00

Because the length of channel to be included in the sample varies dependent upon channel width, samples will be collected "in the vicinity of" each of the listed sampling stations, starting at some random point downstream and passing upstream through the listed sampling station location. Pebble counts will be collected using the Wolman Pebble Count methodology, which randomly selects and quantifies substrate sediment particles.

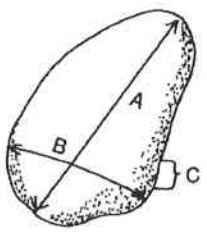
The Wolman Pebble Count Procedure

1. Identify a reach for sediment particle size distribution quantification (pebble count, see stationing above). For stream characterization, pools and riffles are sampled at the same proportion they occur in the stream reach (applicable only to Segment III).

2. Start transect at a randomly selected point (throw a pebble) along the edge of stream, in the vicinity of the sampling station. Take one step into the water perpendicular to flow and, while averting the eyes, pick up the first pebble with the index finger next to the big toe.

3. Measure the B-(intermediate) axis of the particle (see Figure 1) and record in data book. For embedded pebbles or those that are too large to move, measure the shortest axis visible.

4. Because the stream channel is relatively narrow (<11 ft.), the process is repeated by walking upstream in a zigzag pattern instead of perpendicular to flow. After each step, a bed particle is randomly selected by the finger-to-toe method, measured, and recorded. Each sample at each station will consist of measuring 100 particles, in order to accurately quantify substrate distribution.



A = LONGEST AXIS (LENGTH)
B = INTERMEDIATE AXIS (WIDTH)
C = SHORTEST AXIS (THICKNESS)

Figure 13. Sediment particle diameter is measured along the B- (Intermediate) axis.

After the pebble count data is collected, the results will be plotted using The Reference Reach Spreadsheet (see reference above). Subsequent pebble counts will be compared to evaluate sediment sorting and transport within the restored stream channel. As described earlier, it is expected that multiple storm events will be needed to properly mobilize and sort substrate material. Periodic sampling of sediment particle distribution will help quantify this process.

A field evaluation checklist has been created that specifically highlights each of the parameters to be assessed as part of each monitoring effort, as they are described above. The field checklist, attached as Appendix A to this plan, will act as a guide to ensure that all necessary data are collected in the field during each monitoring visit.

3.1.6 Establishment of Vegetation

A visual inspection of the restored streambank, riparian corridor, and wetland areas will be conducted during each monitoring visit for the purpose of qualitatively evaluating overall vegetative cover within those areas where restoration efforts occurred. Notation will be made to overall condition of vegetative re-establishment and an assessment of planting survival will be performed. Photographs will be taken to provide visual evidence of vegetative conditions.

3.1.7 Temperature Monitoring

Water temperatures will be collected with a stream thermometer at each of the eight monitoring cross-sections. Data will be used to establish trends in water temperature over the life of the monitoring program.

3.1.8 Photographs

During each monitoring visit, photographs will be taken of the stream channel and adjacent restored areas. These photographs will be taken from established photo points so photographs can be compared from one monitoring period to the next. Photo points will be established along the right (west) bank of the stream channel, parallel to the throat of each constructed log vane and rock vane. In all, 60 photo points will be established in this manner. One upstream-facing and one downstream-facing photo will be taken from each photo point, oriented so that the stream channel is centered in the photo.

Photo points will also be established at each of the permanent monitoring monuments for the purpose of collecting photos of general site conditions, namely condition of the restored wetland areas. At each monument, photos will be taken facing north, south, east, and west, or oriented in some other direction if more appropriate, to provide visual evidence of the condition of the floodplain and wetland areas. All photos will be defined and oriented appropriately.

3.2 Wetland Restoration

The transect lines established during the design data collection for the site will be re-established and utilized for the collection of wetland monitoring data. Where piezometers have been removed to accommodate the stream and wetland reconstruction, they will be re-established to allow for collection of water levels during each monitoring event.

Figure 1 shows the locations of the monitoring transects. These transects extend from one side of the valley to the other. Sample points will be those established during the field Investigation. Supplemental locations will be identified, as appropriate, dependent upon observed site conditions and to reflect the modifications to the stream location resulting from design execution.

Each covertype along each transect will be documented and the plant species will be identified and recorded. Sample plots will be selected within each covertype for detailed inventorying of plant species. The line intercept method will be used for this task. Data will include species present, percent areal cover, and total percent cover. Observed hydrology will be recorded at each wetland data point. Each identified plant species will be further categorized as to whether they are native, contained in the seed mix utilized during the restoration, or represent colonizing/successional species. An example of this type of species was the appearance of polygonum pensylvanicum (a native species) within Segment III. This species has since been largely replaced by native species in this segment. Observations of invasive species will be noted. Where practical, such species will be physically removed by hand during the monitoring activity. Soils will be inspected at each location to note the development of hydric characteristics.

Each sample plot will be marked with wooden stakes and surveyor's flagging and its position will be recorded using GPS equipment. It is intended that these locations will also function as long-term monitoring points.

A series of piezometers, staff gages, and measurement weirs was installed on the site at the locations shown on Figure 1. Some of these were removed in the course of the restoration activities and will be replaced.

Piezometer replacements will consist of either galvanized drive points that will be driven by hand or PVC materials that will be placed in augured holes and backfilled. Any replacement piezometers will be surveyed utilizing the survey monuments to establish their vertical elevation.

The hydrologic monitoring points will be monitored during each annual monitoring event to establish groundwater elevations along these transects.

During the monitoring activities, records will be kept regarding all wildlife observations including direct visual encounters and vocalizations (e.g., birds and calling amphibians) and their sign (e.g., tracks, feathers, hair, nests, etc.) will be recorded. A list of wildlife using the area will be generated. At least one early morning and one evening recording event will be conducted to provide a comprehensive record of current wildlife use. Constructed vernal pools, standing water in restored wetlands, and the stream will be inspected to observe amphibian species utilizing these features.

4.0 Reporting

4.1 Stream Restoration Monitoring

Monitoring reports for the stream channel will be submitted for review within two weeks of the monitoring visit. The monitoring report will include field data forms and a narrative briefly outlining the condition of each component of the project monitored through the activities listed above. Specific information included in the monitoring report will include:

- Date of data collection;
- Weather conditions during and prior to data collection (outlining precipitation or other factors that might affect the condition of the stream, vegetation, and adjacent area);
- Data sheets derived from The Reference Reach Spreadsheet showing pebble count data, cross-section surveys, and longitudinal profile survey;
- A brief report on the condition of each structure, including notes on any deviations from the as-built state or any indications of structure failure or sub-standard performance;
- A comparison of prior and existing bankfull channel geometry characteristics, identifying and describing any existing condition or change from the as-built condition that may indicate problematic channel performance, aggrading, degrading, or lateral channel migration;

- A comparison of prior and existing pebble count data, identifying and describing any existing condition or change from the as-built condition that indicates rapid aggrading or degrading of the streambed linked to channel instability or an unbalanced sediment transport regime;

- A comparison of prior and existing longitudinal profiles, identifying and describing any existing condition or change from the as-built condition that may indicate a lack of bed feature formation and maintenance, bed aggrading/degrading, or other indicators of impaired channel morphology or impaired sediment transport regime;

- A discussion on the re-establishment of vegetation in the restored areas, evaluating overall percent coverage, colonization of the site by native and/or invasive species (native or non-native), evaluation of planting survival, and overall vegetative health;

- Photographs from the monitoring visit, labeled as to orientation and origin; and

- Recommendations on any corrective measures that may be necessary.

If corrective measures to the stream are recommended in the report, corrective action will be taken within two months of the inspection or the next construction season depending on the timing of the inspection and the type of corrective measures required.

4.2 Wetland Monitoring

A report will be produced within 60 days of the completion of field data collection that presents the data collected during the monitoring event, discusses the findings associated with this data, and identifies any corrective measures or modifications required.

Specific sections to be presented in this report are as follows:

- Discussion of the compliance of the restored wetlands with the success criteria presented in the next section of this plan;
- A discussion of the wetland functions provided by the restored wetlands vs. those that previously existed on the site prior to remedial activities;
- A summary of wildlife utilization and direct observations made during the monitoring event and any other observations resulting from stream restoration site visits and other ancillary activities on the site;
- A comparison of the restored wetland vegetative communities with those observed in the previously existing wetlands, where present; and
- Recommendations for any corrective actions needed to achieve conformance with the success criteria.

5.0 Success Criteria

Success criteria for the project will be evaluated at the end of the monitoring period and will be based upon performance of the restored stream and wetlands and compliance with the stated goals and objectives. Goals and objectives were established by a consensus of the project stakeholders in October of 2005 and are outlined in detail in the *Revised Richardson Hill Road Landfill Superfund Site Restoration Goals and Objectives – Herrick Hollow Creek and Adjacent Wetlands* (March 2006). Specifically, these goals and objectives include:

- Design (and construct) a stable stream channel that minimizes sediment transport from the site.
- Maintenance of perennial flow conditions and the maintenance of conditions conducive to the headwaters of a brook trout stream. This includes the preservation of water temperature, oxygenation, and physical aquatic habitat by providing feature spacing and morphology and reduction of excessive sediment deposition.
- Design the new stream channel such that it achieves self-maintenance in terms of sediment transport competency and in-stream features, such as pools, riffles, overhanging banks, and woody debris. The new stream channel should also exist compatibly with a healthy stream bank, riparian corridor, and adjacent wetland plant communities.
- The stream restoration design should hydrologically integrate with the wetland restoration design such that, where feasible, stream design elements support the maintenance of wetland hydrology and vice versa.

- Minimize the downstream transport of suspended and colloidal materials to prevent the degradation of trout spawning habitat in lower HHC and Trout Creek, as well as reservoir water quality impacts.

- Stabilize the headwater wetlands and riparian corridor and restore their full habitat value consistent with the intent of the New York State Freshwater Wetlands Act, and Section 404 of the Federal Clean Water Act.

- Establishment of a cool water habitat through the restored reach of HHC.

- Maintain fish passage through the lower one-third of the restored channel, while emphasizing grade control, balanced sediment transport, and morphological stability in the upper two-thirds of the channel. The design for the restoration of the upper two-thirds of HHC does not include fish passage as a design criterion.

- Design and construct a stream channel that may require initial adaptive maintenance.

- Design and construct a stream channel and wetlands system that achieves long-term self-maintenance, while providing habitat for local wildlife species.

- Maintain open-water habitats in South Pond and Herrick Hollow Creek to at least the level experienced prior to construction. Before the restoration effort, open-water habitat in South Pond was observed being used by Canada geese (*Branta canadensis*), mallards (*Anas platyrhyncos*), wood ducks (*Aix sponsa*), and various other wetland obligate bird species. Snapping turtles (*Chelydra serpentina*) and northern water snake (*Nerodia sipedon*) were also observed in South Pond and Herrick Hollow Creek prior to and during the restoration process. The open water habitats

available at South Pond and in Herrick Hollow Creek provide needed drinking sources for numerous wildlife species in the area. These areas also provide foraging areas for species such as raccoons (*Procyon lotor*), foxes species and coyotes (*Canis latrans*).

- Preserve adjacent wetlands and there function as wildlife habitat, including the ability to provide areas of vegetation that are good food sources for various animal species. Large mammals such as whitetail deer (*Odocoileus virginianus*) and black bear (*Ursus americanus*) browse on sedges and rushes that are high energy food sources. Wild turkeys (*Meleagris gallopavo*), along with numerous song birds such as blue jays, juncos, blackbirds, and sparrows feed on plant seeds and insects that hatch in wetlands. All of the species named above are known to inhabit the project area and have been either visually observed or left signs of their presence in the project area before and during the construction process. Adjacent wetlands also function as natural sponges, absorbing and discharging water to Herrick Hollow Creek depending on the quantity of water available in the area. This benefits fish and amphibian species using the stream by keeping water temperatures from rising, as well as tempering decreases or increases in flow volume.

- Re-establish sustainable hydrology to stream and wetlands, while providing amphibian breeding pools during periods of increased hydrology in the spring.

- Restoration of the HHC channel will be conducted using accepted natural stream channel design principles.

- Enhancement of stormwater detention basins/sediment traps, by decreasing side wall slopes, this will also allow for easier movement of amphibians during migration periods. Prior to implementing the design

enhancements, red spotted newts (*Notophthalmus viridescens*), northern leopard frogs (Rana pipiens), green frogs (rana clamitans), and American bull frogs (Rana catesbeiana) were all observed using the sediment basin during some portion of their life cycle.

- Conversion of Dimatos Crossing to a ford, while providing easy passage of fish and wildlife up and down stream.

- Only natural materials to be used. The use of natural materials decreases any possible harm of construction material to native wildlife.

5.1 Stream Restoration

The final post-construction monitoring report, to be submitted within 60 days after the last scheduled monitoring visit (September 2011), will include a narrative outlining the success of the project in meeting the project goals and objectives.

Throughout the three-year term of the post-construction monitoring program, project performance will be evaluated through the field monitoring efforts outlined in this report. Success of the stream restoration will ultimately be determined by an evaluation of the compatibility of stream channel conditions and performance with the project goals and objectives. This should not be confused with the compatibility of the constructed channel over time with the restoration design. The list of physical channel parameters to be assessed during the post-construction monitoring phase of the project are intended to provide the design team with quantitative data that can be used to evaluate stream channel performance and trends in channel adjustment over time. Analysis of these will allow the design team to determine where and when noticeable changes in channel condition and/or performance have occurred, the extent to which the

changes have caused the channel to deviate from the intent of the design and project goals and objectives, to identify whether the channel is overall trending towards stability or instability, and to identify the instances and locations where corrective measures are warranted. It is understood that as-built values for each component of channel morphology will shift in the short term. But in order for the stream to perform successfully and to achieve and maintain the project goals and objectives, it must remain stable. Therefore, a fundamental judgment of acceptable variation of channel morphology in the short term will be dictated, in part, by a comparison of measured channel characteristics to the range dimensionless ratio values derived from the reference reach.

5.1.1 Acceptable Channel Evolution and Corrective Measures

At no time is it expected that the response of the stream to a high flow event will result in impaired channel morphology. Evidence of such may indicate substandard performance of one or more components of the constructed channel monitoring reports produced after each monitoring visit will document the professional judgment of the design team regarding the condition and performance of the stream channel, based upon an analysis of the field data, of trends at the site over time, and an understanding of the use of dimensionless ratios in defining an acceptable value range for each parameter as determined from the stable reference reach utilized in the design.

Recommendations regarding the implementation of corrective measures will be made based upon this professional judgment, after consideration of the condition and performance of each component of the channel evaluated during the monitoring visit, both individually and

collectively. Specifically, the mechanism for recommending corrective measures will be based upon evaluation of the following:

Bank Stability: Bank stability will be evaluated during post-construction monitoring, both visually and through data collected during cross-section survey of the channel at permanent transects. Progressive erosion of stream banks can be an indicator of a range of stream responses, most of which likely indicate a trending towards channel instability. However, because changes to channel pattern, dimension, and profile are expected in the short-term following channel construction, professional judgment must be employed to determine whether the bank erosion indicates a shift by the channel towards stability or impairment. This can be determined in part by looking at the severity of the site, or by looking at progression of the channel over time. If bank erosion is coupled with noticeable aggrading or degrading of the channel, channel incision or entrenchment, a trend towards progressive lateral channel migration, or if erosion threatens the integrity of in-stream structures, a recommendation will be made for corrective action. If bank erosion appears to have stabilized itself in the short term, and does not threaten to alter other components of channel morphology, then this would be construed as a minor channel adjustment, and no corrective action would be warranted.

Bankfull Cross-sectional Area: Bankfull cross-sectional area will be evaluated during post-construction monitoring through data collected during cross-section survey of the channel at permanent cross-sections. Furthermore, indications that bankfull cross-sectional area has been altered, as evidence by areas of bed

aggrading, out of bank flows during sub-bankfull flood events, etc. will be noted during each monitoring visit. Again, it is expected that as the channel adjusts to the constructed design, shifting of bed materials will result in localized changes in cross-sectional area as bed features are formed along the course of the channel (for example, formation of pools may increase cross-sectional area, while formation of riffles may cause cross-sectional area to decrease). However, indications that channel cross-sectional area has been significantly reduced to the degree where bankfull flood capacity has been lost will call for corrective measures to be taken.

Width-Depth Ratio: Channel width/depth ratio will be evaluated during post-construction monitoring through data collected during cross-section survey of the channel at permanent cross-sections. Variation of width/depth ratio can occur as a result of bank erosion, lateral channel migration, aggrading and degrading of the bed, or through a combination of these. Although shifting of bed materials is expected to occur during the term of the post-construction effort, width/depth ratio must be maintained. Adjustments to the width/depth ratio will be evaluated based upon comparison with the range of width/depth ratios collected at the corresponding reference reach used to design each segment, and with the range of recognized stable values for the applicable stream type. Deviation from this reference range of stable values will warrant corrective action.

Bed Profile: Bed profile will be evaluated during post-construction monitoring through data collected during longitudinal survey of the channel from station 0+00 to station 35+50. Variation in bed profile

will occur over time as bed material is sorted and bed features are formed. However, areas where bed scour creates a condition trending towards incision or entrenchment or where bed aggrading results in improper structure function or loss of bankfull flood capacity, corrective measures will be warranted.

Structures: Integrity and function of all structures (cross vanes, log vanes, and cascades) will be evaluated during the monitoring visit, and will be quantified to some degree through data collected in the longitudinal survey. Structures will be inspected for evidence of side-cutting, sinking, shifting of arms, or any other conditions that will affect performance of the structure, or its consistency with the construction specifications. These will include passing of water and sediment through seams, tipping of vane rocks over footers, progressive scour around footer rocks, or between vane rocks, etc. Instances when these issues occur will warrant corrective action.

By the end of the monitoring term, it is expected that any adjustments to the channel that might result from high flow events will not result in substandard channel performance or channel instability, and no further adaptive measures will be needed. This is in compliance with the goal that the stream channel and adjacent wetlands exhibit long-term self maintenance. Long-term stream channel and wetland self-maintenance at the end of the three-year monitoring period and compliance with the project goals and objectives will be considered to represent compliance with the success criteria for this project.

5.2 Wetland Restoration

Success of the wetland restoration component of this project will be achieved when the wetlands meet the criteria contained in the goals and objectives previously noted and when the restoration areas possess wetland vegetation, hydrology, and hydric soils as defined by the USACE in their manual (USACE 1987). Specifically, the following criteria shall be met:

- Vegetation must be comprised by a preponderance of vegetation adapted for growth in anaerobic conditions such that not less than 50% of the dominant species have an indicator status of FAC or wetter (i.e., FACW or OBL).
- Hydrologic indicators establish that wetland hydrology is present during the growing season.
- Soils within the restoration areas demonstrate the presence of reducing conditions such that the soils meet the criteria for designation as hydric soils.
- Vegetative cover is not less than 95%.
- Invasive species comprise less than 5% of the total individuals in any area of the site.

CHECKLIST
POST CONSTRUCTION MONITORING OF HERRICK HOLLOW CREEK

ITEM I - SURVEY OF MONUMENTED CROSS-SECTIONS

Survey the following features...

	4+90	6+93	12+72	15+21	19+99	22+25	28+25	32+81
Top of left pin	☐	☐	☐	☐	☐	☐	☐	☐
Base of left pin	☐	☐	☐	☐	☐	☐	☐	☐
Changes in floodplain grade at 1 ft interval or less	☐	☐	☐	☐	☐	☐	☐	☐
Left terrance or bench (if present)	☐	☐	☐	☐	☐	☐	☐	☐
Left top of bank	☐	☐	☐	☐	☐	☐	☐	☐
Left bankfull	☐	☐	☐	☐	☐	☐	☐	☐
Left edge of water	☐	☐	☐	☐	☐	☐	☐	☐
Left toe of bank	☐	☐	☐	☐	☐	☐	☐	☐
Changes in bed grade at 1 ft interval or less	☐	☐	☐	☐	☐	☐	☐	☐
Thalweg	☐	☐	☐	☐	☐	☐	☐	☐
Right toe of bank	☐	☐	☐	☐	☐	☐	☐	☐
Right edge of water	☐	☐	☐	☐	☐	☐	☐	☐
Right bankfull	☐	☐	☐	☐	☐	☐	☐	☐
Right top of bank	☐	☐	☐	☐	☐	☐	☐	☐
Right terrance or bench (if present)	☐	☐	☐	☐	☐	☐	☐	☐
Changes in floodplain grade at 1 ft interval or less	☐	☐	☐	☐	☐	☐	☐	☐
Base of right pin	☐	☐	☐	☐	☐	☐	☐	☐
Top of right pin	☐	☐	☐	☐	☐	☐	☐	☐

ITEM II - SURVEY OF LONGITUDINAL PROFILE

Survey the following features...

- Thalweg at changes in bed slope at 25 ft interval or less ☐
- Thalweg at head, max, and tail of each bed feature ☐
- Thalweg at throat of cross vane ☐
- Thalweg at throat of cascade ☐
- Thalweg at throat of log vane ☐
- Cross vane arm at butt rocks (interface with bank) - both arms ☐
- Cascade at butt rock (interface with bank) ☐
- Log vane arm at butt rock (interface with bank) ☐
- Thalweg at cross vane scour hole ☐
- Thalweg at cascade scour hole ☐
- Thalweg at log vane scour hole ☐
- Bankfull elevation at each thalweg station surveyed ☐
- Left edge of water at each thalweg station surveyed ☐
- Water depth at each thalweg station surveyed ☐
- Note feature type at each shot ☐
- Note relevant bed or bank condition (if present) ☐

ITEM III - INSPECTION OF INSTREAM STRUCTURES

Inspect the following...	Yes	No
Have cross vane arms, throat, or footers moved resulting in functional loss (scour, throat abandonment, toppling, bank erosion, etc.)?	☐	☐
Notes describing condition		
Have cascade rocks moved, leading to functional loss (scour, throat abandonment, toppling, bank erosion, etc.)?	☐	☐
Notes describing condition		
Have log vanes or footers moved, leading to performance issues (scour, throat abandonment, bank erosion, etc.)?	☐	☐
Notes describing condition		
Does structure show evidence of sediment deposition or scour at, above, or below structure	☐	☐
Notes describing condition		
Does structure show evidence of side-washing, bank scour, or other evidence of functional loss?	☐	☐
Notes describing condition		
Note any other conditions affecting structure function		
Note condition and functionality of Dimatos Crossing		

ITEM IV - PEBBLE COUNTS

At each sample location...

Ensure weighted sample matches feature distribution through each stream segment	☐	Ensure methodology is consistent with Wolman protocol	☐
Ensure sample transects include entire bankfull channel	☐	Ensure particle selection is unbiased	☐
Ensure a minimum of 100 particles are measured at each sample location	☐		

ITEM V - PHOTOGRAPHS

Take photos of each instream structure	☐
Take photos of valley facing upstream and downstream at each left bank pin (XS monuments)	☐
Take photos of Dimatos Crossing, channel blocks, and other noteable features of the stream corridor	☐