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Date: 6/14/2010 4:06 PM
Subject: Mechanicville One-Year Streambank Inventory Report
Attachments: NYSEG Mechanicville One-year Streambank Inventory June 2010.pdf

John,

Attached is the One-Year Streambank Inventory Report for the NYSEG Mechanicville - Central Avenue former MGP Site. Please let Tracy or me know if you have any questions.

Thank you,

Scott

Scott Underhill, PE

Project Engineer

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June 14, 2010 **SENT VIA ELECTRONIC MAIL**

Mr. John Spellman
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7014

Subject: Streambank Vegetation One-Year Inventory
NYSEG Mechanicville-Central Avenue Former Manufactured Gas Plant Site
Site #: 5-46-033

Dear Mr. Spellman,

On behalf of New York State Electric and Gas Corporation (NYSEG), AECOM has prepared this letter to summarize an inventory of planted trees, shrubs, and vegetative cover on the restored streambank at the NYSEG Mechanicville Central Avenue Former Manufactured Gas Plant (MGP) site in Mechanicville, NY.

As part of the remediation of the Former MGP Site, the streambank of Anthony Kill was stabilized using a combination of engineered stabilization techniques and vegetation restoration. The objectives of the stabilization of the Anthony Kill streambank were to ensure that the flood-carrying capacity of the stream is not reduced, the potential for streambank erosion is minimized, and to facilitate and promote the natural reestablishment of a healthy riparian habitat. The bank restoration plan included the placement of live stake plantings along the affected streambank and the planting of trees and shrubs along the slope and top of the bank. When fully mature, the plantings are to provide additional stabilization of the streambank as well as canopy to the Anthony Kill.

Following the removal of impacted soils, the stream bank along the Anthony Kill was restored in June and July 2010. Restoration included a six inch layer of topsoil spread across the slope and covered with a degradable erosion control mat (BioNet SC150BN). Live stake, and rooted stock plantings were then placed through the erosion matting. These included: Arrow-wood (Viburnum dentatum); red osier dogwood (Cornus stolonifera); sand bar willow (Salix exigua); pin oak (Quercus palustris); green ash (Fraxinus pennsylvanica), red maple (Acer rubrum)and sugar maple (Acer saccharum); Everlow yew var. everlow (Taxus x Media); Highbush blueberry var. ornablue (Vaccinium corymbosum); Elderberry (Sambucus canadensis) as shown on the planting plan, Drawing 11-R1 from the Remedial Action Design and Work Plan Earth Tech 2008 (Appendix J).

In May 2010,approximately one year following restoration of the streambank, an inventory of the planted trees, shrubs, and vegetative cover was taken. The purpose was to quantify survival of the planted vegetation to determine if the planned survival rates were met. The planned survival criteria were:

- survival rate of trees and shrubs greater than 80 percent,
- coverage rate of seeded areas at least 95% coverage.

If these survival criteria were not met, replacement shrubs and trees would be installed and soil lacking ground cover would be reseeded.

The site was periodically visited to monitor slope stability and condition of the vegetation starting in January 2010. After the spring leaf-break on the trees and shrubs, a plant inventory was taken on April 30, 2010, with a follow-up visit on June 3, 2010 after several weeks of low rainfall. Photographs showing the condition of the vegetation are presented in Attachment 1.

At the April 30, 2010 monitoring visit, the vegetation generally looked good and the trees and shrubs were budding out in normal spring fashion for all species except the green ash. The seepage area at the base of the bank was saturated and most of the green ash trees planted in that area appeared to have experienced winter die-off in the tree canopy. One green ash was completely dead; the remaining five showed scattered buds beginning to break out into leaf. The one pin oak planted in the seepage area was fully budded, but budding out appeared retarded compared to the other three pin oaks planted outside the seepage area. The low temperature of the groundwater may have retarded the spring growth of the plants in the saturated area.

The sandbar willow "live stakes" were doing better than expected. We normally install about twice as many as desired with the expectation that about half will root and survive to grow into trees. A total of 148 out of 152 willow stakes survived (97.3%) the winter and produced sprouts. This willow growth will provide a very dense root mass in the bank by the end of the growing season just above the rip-rap line, protecting the middle bank from erosion. In addition the dense willow thicket along the bottom of the bank is expected to take up the groundwater and expedite its release to the atmosphere by evapotranspiration. Two of the stakes had been chewed by beaver, but the remaining stumps of the chewed stakes were sprouting like the uneaten stakes.

Trees and Shrubs

Red osier dogwood stakes:	2 alive (Most damaged during the reconstruction of the seepage area; replaced with sandbar willow due to season)
Sand bar willow live stakes:	148 alive, 6 dead
Pin oak:	4 alive, 0 dead
Green ash:	5 showing few live buds, 1 dead
Red maple:	11 live, 0 dead (plus 4 live trees planted along the roadway)
Sugar maple:	12 alive, 0 dead
Arrow-wood viburnum:	38 alive, 2 dead
High bush blueberry:	9 alive, 0 dead
Elderberry:	13 alive, 2 dead
Willow (*Salix exigua*):	5 alive, 1 dead

Total nursery stock survival: 245 alive, 12 dead = 95.3% survival

This does not include the red osier dogwood live stake survival, many of which were destroyed during reconstruction of the toe-of-slope in late summer 2009. The high rate of survival of the willow live stakes should balance the lost red osier dogwood live stakes along the rip-rap line. Remediation woody vegetation survival criteria were met.

Groundcover

In addition to the tree and shrub plantings, the area has been seeded with a ground cover mix twice, designed to provide erosion control and some habitat value. The first seeding covered the entire area above the rip-rap line with an upland mixture of grasses and clover. In response to slope instability due to soil saturation just above the rip-rap repair work was completed in the fall of 2009. The soil at the site of the new work was planted with a "contractor mix" with winter rye grass

to ensure root growth in time to provide erosion control over the winter. In April 2010, the repair area was seeded with an upland habitat mix.

During April, May and June 2010, the original seeded area was growing into an area of dense cover dominated by perennial English rye and white clover. A few small patches lacked clover and were dominated by English rye. By June 3, 2010, the repaired area was dominated by winter rye and the upland habitat mix seeds were not yet sprouting. The repaired area is stabilized but is still wet in some areas and might be better seeded with a wetland seed mix.

The seeded area covers approximately 7,527 square feet (193 X 39 feet). Of this area, approximately 1,880 square feet (25%) of top soil were disrupted in the repair work and reseeded. The ground coverage in the repaired area is not as dense as the original seeded areas, but is covered. The remediation ground cover currently meets the survival criteria, however, the habitat value should improve as the upland habitat mix germinates and becomes established as the summer progresses.

Conclusions and Recommendations

Trees and shrubs had an overall survival rate of 95.3%, which is above the required 80% survival rate. Seeded covers most of the restored area and is above the required 95% coverage, though some areas are not as dense as others. These areas should improve as the habitat mix germinates and becomes established.

Should you have any questions or require additional information in the meantime, please do not hesitate to call Scott Underhill at (518) 396-7638 or Tracy Blazicek at (607) 762-8839.

Yours sincerely,

Scott Underhill

Scott Underhill, P.E.
Project Manager
scott.underhill@aecom.com

cc: T. Blazicek, NYSEG
J. Briggs, PhD., C.S.E, AECOM

ATTACHMENT A

Photographic Documentation



Photo 1. Streambank rip-rap, live stakes and planted nursery stock (January 2010).



Photo 2. Streambank vegetation still dormant (March 5, 2010).



Photo 3. Bank vegetation looking up Anthony Kill. Red maple in foreground beginning to show leaf buds. Ground cover vegetation beginning to emerge (March 26, 2010).



Photo 4. Tree and shrub buds breaking into leaf. Ground cover emerging from erosion control mat (April 7, 2010).



Photo 5: Wide view of site upstream from North Central Avenue (April 7, 2010).



Photo: 6. Trees, shrubs, willow live stakes, and groundcover leafing out. Excellent survival; exception is the green ash trees with limited leaf growth, indicating stress (April 30, 2010).



Photo 7. Willow live stakes showing new shoots in saturated area above rip-rap (April 30, 2010).



Photo 8. Winter rye growing in repair area with willow live-stakes; white clover dominant cover species to the left, up the bank (June 3, 2010).



Photo 9. Flotsam marks high water line on riprap. Willow live stakes (June 3, 2010).



Photo 10. Excellent growth on elderberry shrub. Willow stakes sprouting in background (June 3, 2010).



Photo 11. Flowering high-bush blueberry shrub. White clover groundcover in background (April 30, 2010).



Photo 12. Area of rye cover with no clover (April 30, 2010).



Photo 13: Site showing dead Green ash tree (with pink flag) in foreground. Other stressed green ash trees in background. Willow live-stakes with 10- to 15- inch shoots (May 21, 2010).