



December 14, 2006

Dean Tagliaferro
EPA Project Coordinator and On-Scene Coordinator
U.S. Environmental Protection Agency
c/o Weston Environmental Engineering
One Lyman Street
Pittsfield, MA 01201

**Re: GE Pittsfield/Housatonic River Site
Upper ½-Mile Reach Removal Action (GECD800)
2006 Bank Erosion Inspection**

Dear Mr. Tagliaferro:

Consistent with the requirements set forth in the final *Removal Action Work Plan – Upper ½-Mile Reach of the Housatonic River* (Work Plan; Blasland, Bouck & Lee, Inc. [BBL], August 1999), the General Electric Company (GE) has performed the 2006 inspection of the restored banks of the Upper ½-Mile Reach to assess both the cleared and restored areas of the riverbank for evidence of erosion. This inspection occurred on June 2, 2006 with representatives of the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), GE, and BBL in attendance. The following people performed the inspection:

- Dean Tagliaferro, EPA;
- Randy Sujat, USACE;
- Andrew Silber, GE and
- Mark Graveling, BBL.

This trip report has been prepared to describe the findings of the 2006 bank erosion inspection – i.e., the areas identified with evidence of measurable erosion or armoring material movement – and the response actions proposed to address those areas. Figure 1 illustrates the location of the areas at which measurable erosion or material movement was observed. In addition, in accordance with requirements of the Work Plan, GE has identified, to the extent practicable, the likely cause of the erosion and has evaluated the source, dispersal, and quantity of eroded soil (if any) in the river. This evaluation, and GE's proposed measures to restore the identified areas to previous conditions and to protect against further erosion, are described below for each area, and are summarized in Table 1.

During the June 2, 2006 bank inspection, flow in the river was approximately 199 cubic feet per second (cfs), as measured at U.S. Geological Survey (USGS) River Gauge Station No. 0118700 on the East Branch of the Housatonic River in Coltsville, MA. It should be noted that although the flow in the river was less than 200 cfs at the time of the inspection, an extreme high-flow event had occurred in October of 2005 (several months after the 2005 bank erosion inspection), during which recorded flows at the Coltsville gauge exceeded approximately 6,300 cfs, a flow which exceeds the calculated 50-year flood in the river.



At the time of the inspection, several areas were noted with either a visually observable loss of bank soil or movement of bank armoring. These areas are identified on Figure 1. Where appropriate, certain areas may require protection from further erosion through the placement of armor stone. Armor stone placed as part of these activities will be similar to that used during the implementation of the Upper ½ Mile Reach Removal Action (i.e., graded riprap, $D_{100}=12$ -inch), as fully described in the Work Plan.

Descriptions of areas of erosion identified during the 2006 inspection, along with proposed area-specific response actions, are presented below.

Areas with Measurable Erosion

Area 1 – This area consists of approximately 25 feet of undercut bank, located on the northern bank of the river approximately 200 feet downstream of Building 64X in an area where no remedial activities were performed either in the river or on the riverbank (see Figure 1 and Photo 1). This area of observed erosion is located downstream of rip-rap placed adjacent to sheetpiles installed during past remedial activities, where the bank transitions from riprap to bank soil. In this area, less than 10 cubic yards (cy) of bank soil appear to have eroded from the bank. The source of the eroded material appears to be native material from the low- and mid-bank area directly down-slope from established grassy vegetation. The cause of erosion appears to be a combination of the transition from riprap to unprotected bank soils and the high velocity flows associated with the extreme flood event discussed above. No eroded soil was observed in the adjacent portion of the river and, therefore, no removal activities are planned at this location.

As discussed during the inspection, the proposed response action in this area will consist of placement of armor stone to replace eroded materials and protect against further such erosion. To the extent practicable, armor stone placed in this area will be keyed into the bank such that areas receiving armor stone will be restored to previous grades, resulting in no net change in the location-specific flood storage or conveyance capacity. GE plans to complete such activities during the 2007 construction season.

Area 2 – Area 2 includes two areas (see Figure 1). The first area consists of approximately 40 feet of undercut bank, located on the southern bank directly across the river from Building 64W in a non-remediated bank area (see Photo 2). In this area, less than 5 cy of bank soil appears to have eroded from the bank. The source of the eroded material appears to be native material from the low- and mid-bank area directly upstream of a riprap swale. The cause of erosion appears to be high velocity water flow, likely associated with the extreme flood event discussed above. No evidence of eroded soil was observed in the adjacent portion of the river and, therefore, no removal activities are planned at this location. As discussed during the inspection, the proposed response action in this area will consist of placement of armor stone to replace eroded materials and protect against further such erosion. To the extent practicable, armor stone placed in this area will be keyed into the bank such that areas receiving armor stone will be restored to previous grades, resulting in no net change in the location-specific flood storage or conveyance capacity.

Additionally, there is a slight undercut that extends for approximately 100 feet downstream of the same drainage swale discussed above and that appears to have involved the erosion of less than 5 cy (see Photo 3). To the extent practicable, GE will place armor stone (similar to above) within this undercut to limit any future erosion from this area.

GE plans to complete the above-described activities during the 2007 construction season.

Area 3 – This area is located on the northern bank, in a non-remediated area, approximately 200 feet downstream of Building 64W (see Figure 1). In this area, less than 1 cy of bank soil appears to have eroded from within a 5-foot long slight undercut just above a riprap area in the channel (see Photo 4). The source of the eroded material appears to be native material from the mid-bank area. The cause of erosion appears to be high velocity water flow, likely associated with the extreme flood event discussed above. No evidence of eroded soil was observed in the adjacent portion of the river and, therefore, no removal activities are planned at this location. As discussed during the inspection, armor stone will be placed in this area to replace eroded materials and protect against further such erosion. As in Areas 1 and 2, to the extent practicable, armor stone placed in this area will be keyed into the bank such that areas receiving armor stone will be restored to previous grades, resulting in no net change in the location-specific flood storage or conveyance capacity. GE plans to complete such activities during the 2007 construction season.

Area 4 – This area consists of a slightly undercut bank, extending over approximately 30 feet of the southern riverbank just upstream of riprap-protected banks, in a non-remediated area approximately 200 feet upstream of the eastern edge of the Newell Street Area II Parking Lot (see Figure 1 and Photo 5). In this area, less than 1 cy of bank soil appears to have eroded from the bank. The source of the eroded material appears to be native material from the low-bank area. The cause of erosion appears to be high velocity water flow, likely associated with the extreme flood event discussed above. No evidence of eroded soil was observed in the adjacent portion of the river and, therefore, no removal activities are planned at this location. As discussed during the inspection, armor stone will be placed in this area to replace eroded materials and protect against further such erosion. Again, to the extent practicable, armor stone placed in this area will be keyed into the bank such that areas receiving armor stone will be restored to previous grades, resulting in no net change in the location-specific flood storage or conveyance capacity. GE plans to complete such activities during the 2007 construction season.

Area 5 – Area 5 is located on the southern bank adjacent to the Newell Street Area II Parking Lot, and extends from a point approximately 15 feet downstream of the former pedestrian bridge to approximately 500 feet upstream of the bridge (see Figure 1). Within Area 5 there are several intermittent areas of undercut bank, from which bank soils have been eroded (see Photo 6), and steep, near-vertical slopes are present that potentially could further erode or fail (Photo 7). The observed erosion is likely a result of the high velocity flow associated with the extreme flood event discussed above, but may also be related, to some extent, to settling of the riprap in this area. The sources of eroded materials in this area appear to be native materials or clean backfill, as portions of Area 5 proposed for removal intersect areas that have been previously remediated. No evidence of eroded soil was observed in the adjacent portion of the river and, therefore, no removal activities are planned at this location. During the inspection, it was discussed that this area would likely require excavation of the remaining steep slopes to tie into post-construction Newell Street Area II grades, as well as armor stone placement to restore this area to grade and reduce the potential for further erosion.

Following the site visit, GE made a preliminary assessment of the removal of certain bank materials in this area to reduce the grade of the remaining slopes. It was assumed that excavation of bank materials would be performed to reduce the slope in those areas where undercutting has left near-vertical banks. Figure 2 shows the locations of six representative cross sections drawn through Area 5, as well as the extent of Area 5 where GE proposes to remove bank materials. In addition, Figure 2 shows those areas that have previously been remediated, and the concentrations of polychlorinated biphenyls (PCBs) in remaining bank soils. Figure 3 shows the six cross

sections of the Area 5 bank, and provides an illustration of those portions of bank materials that GE proposes to remove.

As shown on Figures 2 and 3, removal is proposed to be conducted between Station 1+20 and Station 4+50, and is anticipated to proceed up the bank such that approximate 2:1 (horizontal to vertical) bank slopes will extend from the upper extent of the removal area to the edge of armoring around the perimeter of the engineered barrier placed over the Newell Street Area II Parking Lot. Total removal of in-situ bank material in this area is estimated to be approximately 220 cy. Removal is anticipated to be performed with conventional equipment from the top-of-bank (with appropriate safeguards to protect the engineered barrier in that area).

At this time, soil removal activities are not anticipated to extend into bank soils where existing sampling data (presented on Figure 2) show PCB concentrations exceeding 50 parts per million (ppm). Most of the sampling results within or adjoining the horizontal extent of the removal area show PCB concentrations below 50 ppm (see Figure 2); and at the few locations where samples containing PCBs greater than 50 ppm are within or adjacent to the horizontal extent of the removal area, those samples were collected at depths well below the proposed soil removals. Since the materials to be excavated from within Area 5 are thus not subject to regulation under the Toxic Substances Control Act, they will be directly loaded into appropriate vehicles for transfer to and placement in GE's Hill 78 On-Plant Consolidation Area. Complete details of the materials handling, transportation, and disposition plan will be discussed in a forthcoming separate submittal.

Following removal, those portions of the approximate 300-foot length of bank subject to removal will be lined with a non-woven geotextile and covered with armor stone to replace eroded materials, restore this area to previous grades (i.e., pre-erosion), stabilize these banks, and protect against further such erosion. At this time, it is not anticipated that additional excavation will be required to accommodate armor stone placement. Armor stone placement will include an approximate 1-ft thick layer of $D_{100}=12$ -inch graded riprap, as discussed above, that will be tied into existing armoring at the toe of the slope and extend approximately 10 to 15 feet up the bank. Such armor stone placement in this area is anticipated to require approximately 200 cy of armor stone, resulting in a net gain in flood storage capacity as the anticipated volume of armor stone is less than the anticipated removal volumes discussed above.

At the conclusion of armor stone placement in these areas of removal, any space that remains between the upper extent of bank armoring and the lower extent of the Newell Street Area II Parking Lot excavation and that has been disturbed as a result of removal activities will be replanted in accordance with the planting specifications described in the Work Plan. At this time, it is anticipated that a single band of red-osier dogwoods will be installed along the top of the newly placed armor stone. In accordance with the Work Plan, the red-osier dogwood band will be installed at a density of one plant every four lineal feet. Following installation of the dogwood plants, the area remaining between this dogwood band and the edge of the Newell Street Area II Parking Lot excavation will be planted with replacement trees on an as-needed basis to replace specific plants and species that may be disturbed or removed as a result of soil removal activities. Following installation, all such plants will be maintained in accordance with the requirements in the Work Plan.

In addition, several small areas of slightly undercut banks were observed between Station 0+00 and Station 1+20, and upstream of Station 4+50 (Photo 8). Following completion of bank soil

removal activities as described above, armor stone will be placed in these undercut areas to protect against further such erosion (see Figure 2).

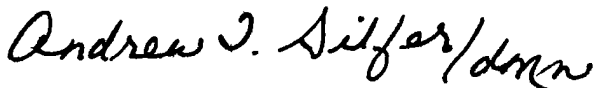
Area 6 - This area is located on the northern bank between Building 62 and the Lyman Street Parking Lot (see Figure 1). In this area, an approximate 30-foot long section of the top of bank appears to have sloughed and slid to the bottom of the bank (see Photo 9). Despite this sloughing, there does not appear to have been any erosion or material loss in this area, and there were no observations of eroded materials in the adjacent portion of the river. As discussed during the inspection, the sloughed portions of the bank in this area will be removed, and armor stone will be placed in this area to provide increased stabilization. Any such armor stone will be installed in this area such that it is tied into existing armor stone at the toe of the slope to provide a continuous line of protection from further erosion. Similar to plantings in Area 5, and in accordance with the Work Plan, a single band of red-osier dogwoods will be installed above the upper extent of armor stone in this area at a planting density of one plant every four lineal feet. GE plans to complete such activities during the 2007 construction season.

Note that in addition to the areas discussed herein, the Natural Resource Trustees previously identified an area on the north bank of the river, immediately downstream of the Newell Street Bridge, as having been eroded and perhaps requiring additional attention. During the inspection discussed herein, this area was not located, and erosion was not noted in the area of the Newell Street Bridge. GE continued to look for this area of erosion throughout the summer of 2006 during the course of routine site inspections, but was unable to locate or identify the area noted by the Trustees. GE will inspect this area again, with EPA collaboration, during the 2007 Annual Restored Banks Erosion Inspection, and, if necessary, will address any erosion identified in this area at that time.

GE will continue to conduct inspections in accordance with the requirements of the Work Plan. The remaining schedule for bank erosion inspections includes one final inspection to be performed in 2007 before a long-term monitoring plan is proposed.

Please contact me if you have any questions.

Sincerely,



Andrew T. Silfer, P.E.
GE Project Coordinator

Attachments

cc: ~~Timothy Inglis, USEPA~~
Tim Conway, USEPA
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James Bieke, Goodwin Procter
Public Information Repositories
GE Internal Repositories

TABLE 1
 2006 RESTORED BANK EROSION INSPECTION SUMMARY
 UPPER 1/2-MILE REACH REMOVAL ACTION MONITORING

GENERAL ELECTRIC COMPANY - PITTSFIELD MASSACHUSETTS

Area	Description	Approximate Size	Action
Areas with Measurable Erosion			
1 - North bank of river, directly across from Hibbard Playground	Erosion of soil and undercut banks. Non-remediated bank area. No evidence of eroded soil in river.	~25-ft of undercut banks	Restoration activities to include installation of armor stone to protect against further erosion.
2 - South bank of river, ~200' downstream of Hibbard Playground	Erosion of soil and slightly undercut banks. Non-remediated bank area. No evidence of eroded soil in river.	Two areas: total of ~140-ft of slightly undercut banks	Restoration activities to include installation of armor stone to protect against further erosion.
3 - North bank of river, behind Building 63	Erosion of soil and undercut banks. Non-remediated bank area. No evidence of eroded soil in river.	~5-ft of undercut banks	Restoration activities to include installation of armor stone to protect against further erosion.
4 - South bank of river, directly upstream of the Newell St. II parking lot	Erosion of soil. Non-remediated bank area. No evidence of eroded soil in river.	~30-ft of undercut banks	Restoration activities to include installation of armor stone to protect against further erosion.
5 - South bank of river, directly behind Newell St. II parking lot	Erosion of soil and undercut banks. Remediated and non-remediated bank areas. No evidence of eroded soil in river.	Several areas: total of ~300-ft of undercut banks	Restoration activities to include removal and re-grading of bank materials and installation of armor stone to protect against further erosion.
6 - North bank of river, directly upstream of Lyman St. parking lot	Sloughing of top-of-bank: sloughed materials have slid to bottom of slope. Remediated bank areas. No evidence of eroded soils in river.	~300 ft ² (an approximate 30-ft long section of the top-of-bank)	Remove sloughed materials, regrade affected areas and install additional riprap at toe of slope, if necessary, to stabilize remaining bank materials.



Photo 1 – Area 1: Approximately 25 feet of undercut bank at the end of a section of rip-rap.



Photo 2 – Area 2: Approximately 40 feet of undercut bank upstream of swale.



Photo 3 – Area 2: Approximately 100 feet of slight undercut downstream of swale.



Photo 4 – Area 3: Slight undercut above rip-rap.



Photo 5 – Area 4: Slight undercut between rip-rap.



Photo 6 – Area 5: Several small areas undercut above rip-rap.



Photo 7 – Area 5: Example of near vertical face proposed for removal.



Photo 8 – Area 5: Slight undercut proposed to be armored.



Photo 9 – Area 6: Bank sloughing, no erosion evident.