

Memorandum

Date: October 11, 2006

To: Rosie Pope and Board of Directors at Whitehall Mill Lofts

Cc: Laurie Fowler, Alfie Vick

From: Charlie Maffitt

Subject: Stormwater issues at Whitehall Mill

Stormwater runoff is one of the most significant sources of waterway pollution. As more and more of the natural world is developed, impermeable surfaces such as parking lots and buildings contribute more and more runoff water to our streams and rivers. Pollutants such as antifreeze, oil, and other chemicals which collect on paved surfaces, are picked up by the wash of water caused by sudden rainstorms and are carried into our waterways in copious amounts.

The Whitehall Mill Stormwater retrofit project seeks to identify ways in which the stormwater runoff generated by impermeable surfaces at Whitehall Mill Lofts can be mitigated, ultimately reducing both the volume and rate at which stormwater runoff occurs and the amount of pollutants it carries enter the adjacent river, which is a water source for hundreds of downstream communities within the Upper Altamaha Watershed. In addition, we will seek to reduce as much as possible the erosive effect of stormwater on the property's soils, and to contribute to the aesthetic appeal of the community.

As per the request of the landscape committee at Whitehall Mill, this memorandum will focus on the immediate need for guidance regarding the stabilization of the large steep slopes which have recently been cleared. Later correspondences will follow, summarizing all the recommended stormwater control techniques at Whitehall Mill.

Recommendations for immediate action:

Control of the invasive species (in this case specifically Chinese Privet, *Ligustrum Sinense*) has to be the primary step. This can be done in one of two ways; physical removal of the privet by the roots, or by herbicide. A combination of the two methods is usually most effective. Physical removal can be made easier by tools such as Weed Wrenches or Privet Pullers (see <http://www.weedwrench.com/> for an example of such tools). However, this is still very physical work, and the landscape committee has already made it known that they would like to avoid further heavy maintenance on the bank due to its steepness, which may rule out physical removal.

According to Mark Czarnota with the UGA College of Agricultural and Environmental Sciences, studies have shown that herbicides containing glyphosate in at least 41 percent solution, (Roundup is an example) or triclopyr (Brush-B-Gon or Garlon) are most effective at

controlling Chinese Privet. If using Roundup, you should mix six ounces of solution with every one gallon of water for effective privet eradication.

If you are planning on spraying herbicide, this should probably be done as soon as possible in order to have enough time later in the fall to plant new plantings. Given the fact that this project seeks to reduce the amount of pollutants running off into the river, I should point out that most of this herbicide will undoubtedly end up in the river, and efforts should be taken to use as little as possible. The best method therefore is spot-treatment, rather than to spray the whole hillside. Again, combining herbicide with physical removal is probably the best way to ensure that future privet removal efforts are not necessary. For more information on controlling privet, refer to the following website: <http://www.invasive.org/eastern/eppc/privet.html>.

Once the invasive plant species have been controlled, the next step will be mulching and planting the hillside. Mulch is used to encourage plant growth, retain moisture, and to avoid having bare earth which erodes quickly, especially at the kind of slopes we're talking about. Shredded hardwoods make good mulch which is less susceptible to washing away than pine bark and is commercially available. Another alternative might be to use compost mulch in combination with erosion control matting (see www.filtrexx.com for one commercial example of such a method).

I then suggest you seed the bank with an Annual Ryegrass (*Lolium Multiflorum*), mixed in with the seeds of other native grasses such as Indiangrass (*Sorghastrum nutans*) and Switchgrass (*panicum virgatum*). The ryegrass will quickly develop a root system which will hold the top layer of soil in place during the winter months and reduce the amount of soil erosion caused by the water running off the slope. Mowing of the grasses should not be necessary, as they will have a maximum height of 2-3 feet and should not obstruct any views. Unmown ryegrass has the additional benefit of producing seed food and habitat for wildlife and birds, and flowers in the spring. Annual ryegrass is an excellent cold-weather grass, and will do well in the winter when other plants tend to retreat. The ryegrass will die off around June, just as the other grasses are getting established, but its immediate role is to quickly develop a shallow root system to hold the bank in place and to serve as a cover crop during the winter while the other grasses are getting established.



Fig. 1: Example of seeded, unmown native grasses at Cuscowilla GC, Lake Oconee, GA.

I suggest not beginning planting of a shrub layer until the early spring, after the ryegrass has formed a root system and the remnants of the herbicide have gone away. At that time, I would recommend planting a variety of small shrubs, keeping in mind that if your desire is for a low-maintenance landscape, the best species to use will be those native to the area. Native shrubs are most adapted to the climate of Northeast Georgia, and require less water and less maintenance. I recommend some native species of Azalea, such as Flame Azalea (*Rhododendron calendulaceum*), Pinxterbloom Azalea (*Rhododendron Nudiflorum*), and most importantly in this area Piedmont Azalea (*Rhododendron Canescens*), as they will produce striking blooms in the spring without the watering needs of other azaleas.

While I know that the landscape committee wants to minimize the amount of maintenance they have to do on the steep banks, I must point out that the **only** “no-maintenance” option is to let the privet and mimosa grow back up. Everything else will take some amount of maintenance, but the recommendations presented in this memo intend to create as low-maintenance a situation as possible. Other recommended shrubs include Bottlebrush Buckeye (*Aesculus Parviflora*), Arrowwood Viburnum (*Viburnum Dentatum*), and Virginia Sweetspire (*Itea Virginica*). Forsythia (*Forsythia x Intermedia*) was also discussed as an option, although it must be noted that Forsythia is a non-native shrub and would probably require more watering than a native in order to thrive. I also advise against planting just one species on the bank, but

suggest rather a diverse collection of species, i.e. pick four or five (or more) species to plant, and this will encourage diversity of species as well as be more interesting to look at.



Fig 2. Flame Azalea

Native trees such as Water Oak, Sweetgum, and Tulip Poplar, as well as the invasive Privet and Mimosa, will continue to attempt to re-colonize the site: there is no getting around it, that's just how nature works. Twice-annual weeding should be sufficient to keep the hillside covered only by shrubs. Alternatively, you may want to consider letting a select few of these native seedlings (not the invasives) grow into full-sized trees, widely dispersed over the area. If left to mature, these would provide shade for the shrub layer, build strong root systems to hold the hillside in place, and would more closely mimic the natural woodlands of northeast Georgia.

As previously discussed, the construction of a retaining wall at the bottom part of the bank next to the parking lot is advisable. The slope of the hill at this spot is too steep to control with plantings, and will continue to wash out into the parking lot unless a wall is constructed. Retaining walls built with concrete or stone (either mortared or stacked) are best because they have the longest life-span. Wooden retaining walls are less desirable because they will fail sooner. I advise creating a swale or rain garden at the base of this wall, between the wall and the parking lot, to collect the water coming off the hill and from the wall's drains. This will ensure that water will not just fall from the wall straight onto the parking lot pavement and then straight into the river. A design for this stormwater detention area will be included in the final master stormwater plan to be presented in December.

Further terracing of the steep bank is not recommended, as terraces would require the construction of many retaining walls and would not prevent soil erosion and water runoff in any way. However, if the board wants to build a small footpath along the bank, this can be done without the need for retaining walls and should not adversely affect the hillside.

Also to be included in the master plan in December are:

1. A design for a water feature made of boulders where water from an exposed pipe currently is a source of bank erosion during major rain events.
2. Designs for rain gardens or other stormwater collection areas to be built on-site.
3. A design for a rainwater harvesting system which may provide the residents of Whitehall Mill with water for rainwater landscaping and other needs, ultimately reducing water costs and consumption as well as the amount of runoff from the site.
4. Further recommendations for erosion control on the steep banks.
5. Recommendations for rooftop garden design.

Please let me know if you have questions about any of this.

Thanks,

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