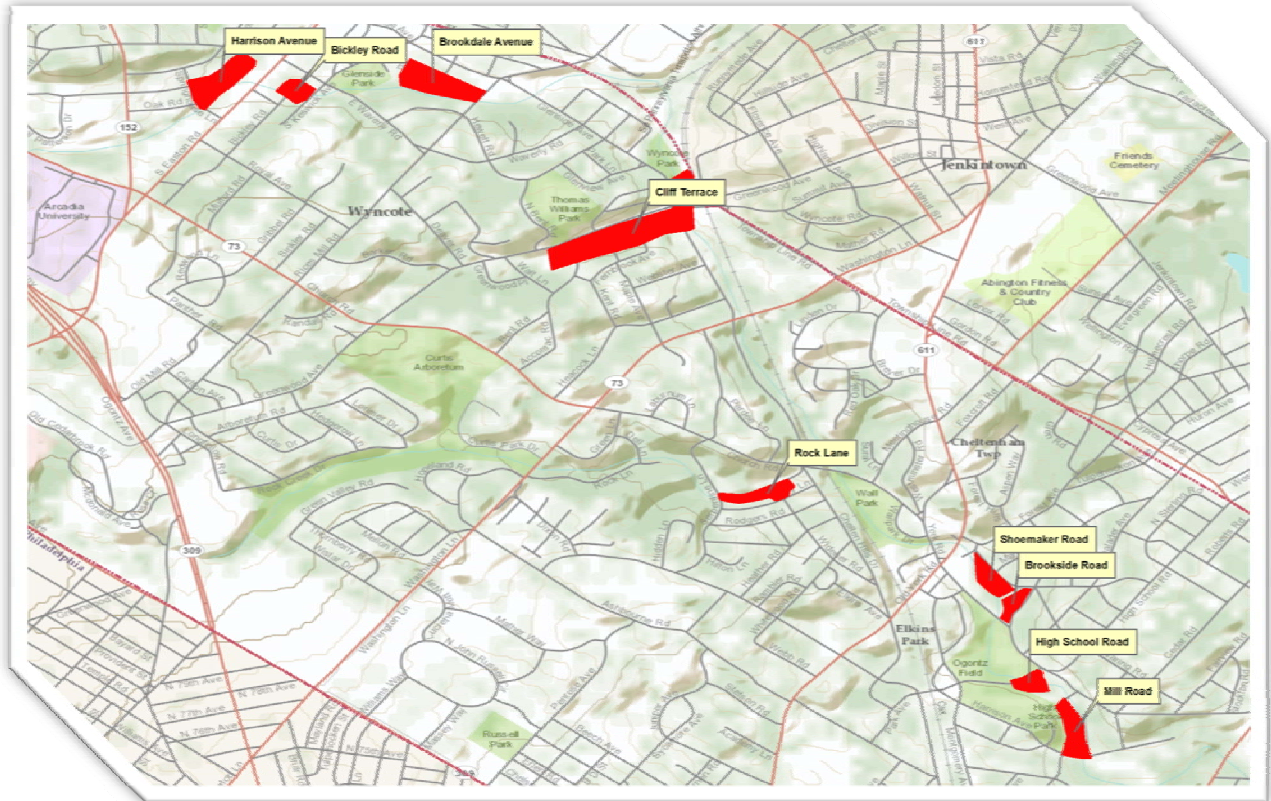


Tookany Creek Flood Damage Reduction Feasibility Study Section 205 Continuing Authorities Program



Field Inspection Notes 27-29 September 2012



**US Army Corps
of Engineers**
Philadelphia District

Introduction

The U.S. Army Corps of Engineers (Corps), in accordance with the Project Management Plan (PMP) for the Tookany Creek Flood Damage Reduction Feasibility Study, is developing existing conditions models of the hydrologic and hydraulic characteristics of the Tookany Creek Watershed. As part of that effort, the Corps and Cheltenham Township deployed an assessment team to field inspect nine neighborhood areas over a three day period and gather critical information to calibrate the models. Additionally, the team gathered preliminary data to support the development of opportunities for flood mitigation. The following report summarizes the field notes captured during those inspections. The sections below do not necessarily present a complete representation of the area, but rather supplement the data available through citizen surveys, photographic journals and many other studies completed within this watershed.

The assessment teams included the following personnel:

U.S. Army Corps of Engineers	
Erik Rourke	Project Manager
Micah Kirkpatrick	Economist
Michael Bartles (27 th and 29 th only)	Hydraulic Engineer
Robert Moore (28 th and 29 th only)	Hydraulic Engineer
Glen Stevens (27 th and 29 th only)	Hydraulic Engineer
Doug Leatherman	Civil Engineer
Cheltenham Township	
Pat Duffy (27 th only)	Township Engineer
Mike Flemming (28 th only)	Public Works Director
Joe O’Neill (29 th only)	Fire Marshal

Table 1: Assessment Team Personnel.

The team adhered to the following schedule prepared by organizes from Floodside.

September 27, 2012
Brookdale Avenue
Brookside Road
Harrison Avenue
September 28, 2012
Rock Lane/Widner Road
Bickley Road
Cliff Terrace
September 29, 2012
High School Road
Shoemaker Road
Mill Road

Table 2: Schedule of site visits.

September 27, 2012 (Thursday)

0930 Brookdale Avenue: Approximately 34 homes are located along Brookdale Avenue. A small berm maintained by the Pennsylvania Department of Environmental Protection (PADEP) runs along Tookany Creek. The berm ties into high ground at the Rices Mill Road Bridge where the Township operates a pump station for internal drainage. The pump station receives power from the main electrical grid and is supplemented with diesel generators in the event of a power failure. Immediately downstream of the bridge is the George Perley Bird Sanctuary.



Figure 1: View looking upstream along Tookany Creek at Rice Mill Road. Pump Station is shown on the right.

According to the residents interviewed, flooding occurs in this area predominantly because of interior drainage issues associated with runoff flowing down Keswick Avenue. Although water has reached the top of the berm, residents reported the berm has not overtopped except near the pump station at Rices Mill Road Bridge. Most of the damage reported includes damage to vehicles and contents associated with basement flooding. The PADEP is evaluating a flood control project in this area that includes raising the berm and the construction of several basins.

1100 Brookside Road: An unnamed tributary enters a culvert just upstream of the intersection of Shoemaker and Brookside Roads. The stream remains underground until discharging into the Tookany Creek approximately 250 feet upstream of Church Road. Approximately nine homes experience flooding in this area. According to residents, the flooding predominantly occurs because of ground water infiltration. During heavy rainfall events, water will accumulate behind the homes in the location of the original stream channel. Testimonial data indicates the water



Figure 2: Culvert at upstream limit of underground portion of the unnamed tributary before flowing behind the homes on Brookside Road.

begins to back up behind a wall adjacent to Tookany Creek until a ponding area forms. Evidence, indicated by signs of erosion, suggests sheet flow may occur down Brookside Road (from Church Road) and flow between two homes and potentially contributing to the ponding area. Water enters the homes through basement drains and/or cracks in the foundation walls. Some of the homes had small parapet walls surrounding basement windows that indicate the homes may have experienced basement flooding from overland flow.

1330 Harrison Avenue: Behind the homes located along the 200 Block of Harrison Avenue within the Glenside/Edge Hill drainage portion of Tookany Creek, two stream branches converge

at 90 degree angles and enter a subsurface culvert. Upstream along the eastern branch are several small parks. Upstream along the western branch is the recently constructed Glenside Elementary School. The Glenside Elementary School supposedly contains an underground stormwater management system. According to testimony from local residents, the majority of flooding occurs from drainage unable to reach the creek. Near the middle of the 200 Block of Harrison, a storm drain carries flow from the streets to the creek. The elevation difference between the inlet and outlet is small with the outlet only 18 inches above the creek bottom. This small change in elevation results in water being unable to drain from the streets. Similar issues occur near the intersection of Springhouse Lane and Oak Road. The majority of damage in both areas is contained to vehicular damage and basement flooding.

Prior to reaching the confluence behind the homes, the eastern branch flows under the Harrison Ave Bridge. Testimony suggested this bridge has not been overtopped, however stormwater does flow parallel to the bridge contributing to the issues near the middle of the 200 block. Further upstream from this location, the stream runs adjacent to several parks.



Figure 3: One of the parks upstream of the Harrison Avenue site.

September 28, 2012 (Friday)

0930 Rock Lane/Widener: Flooding along Rock Lane occurs predominately upstream of Widener Road and downstream of Serpentine Lane. At some point in the 1960's, Cheltenham Township acquired several homes between these two points and adjacent to Rock Creek. Majority of the flooding is contained to basement and vehicular damage along Rock Lane. Although, following the 2011 Tropical systems, one structure along Widener Road sustained significant structural damage. At this location, Rock Creek enters a culvert before traveling an unknown distance and discharging into Tookany Creek.

Rock Creek empties into Tookany Creek just downstream of the Church Road crossing adjacent to SEPTA's railroad tracks. Next to this location is Wall Park. Cheltenham Township's temporary pumps for the sanitary bypass system are also located at this location. Upstream from this location along Tookany Creek, SEPTA replaced a bridge crossing increasing the hydraulic

efficiency under the bridge. Resident testimony suggests flooding has increased since SEPTA completed this project.



Figure 4: Area of previous acquisition project by Cheltenham Township in 1960s along Rock Creek.

The inspection team also visited a property located along Heather Road. At this location, stormwater runs down a steep incline causing property damage adjacent to the driveway.

1100 Bickley Road: Eight homes along Bickley Road experience similar circumstances to the residents along Harrison Ave. Approximately 70 feet after Tookany Creek flows under Bickley Road, it enters a culvert and travels approximately 125 feet before daylighting. Within these 125 feet, the creek makes an approximate 90 degree turn. Resident testimony indicates water backs up behind South Keswick Ave. flooding the back yards while stormwater ponds in front of the houses. One inlet along the 200 block of Bickley Road drains the runoff from this area. Residents indicated water as deep as 10 feet behind the homes. Damage in this area consists of basement flooding and vehicular damage. One structure reported receiving structural damage to a front porch footer, however the claim was denied by Flood Insurance.

On the opposite side of Bickley Road, one resident described runoff from businesses along Easton Road draining into her property. At the back end of her property, a drain carries the water back to Tookany Creek upstream of the Bickley Road crossing.

Residents also provided information concerning a drainage system utilized by Bishop McDevitt High School to keep their athletic fields in playable condition. The school drains the fields into a swale that runs towards the Glenside Free Library and eventually toward the back of the properties along Bickley Road.



Figure 5: Single storm inlet along Bickley Road

1300 Cliff Terrace: Upstream of All Hallows Church, at the intersection of Greenwood Ave. and Bent Road, a tributary to Tookany Creek enters a culvert to traverse under the church before becoming an open channel again for approximately 215 feet before entering another culvert just upstream of Maple Ave. The tributary remains in the culvert for approximately 930 feet before entering Tookany Creek. During the site visit, the team noted that the inflow rates observed at the upstream portion were higher than the observed rates discharging into Tookany Creek. Along the alignment of the culvert, numerous inlets experience significant debris blockages during an event. The culvert alignment follows the natural drainage within the area represented by steep slopes on each side of the channel centerline.

Flooding in this area is predominately limited to vehicular damage, basement flooding and damage to exterior structures (garages/sheds). One resident documented significant damage from a walkout basement. The flooding occurs when surface water reaches the natural drainage channel during high intensity storms, following the terrain contours and flows towards Tookany Creek.

The Jenkintown SEPTA parking lot along Greenwood Avenue and Glenside Avenue also suffers from damage during flooding events. The stream banks in this area consist of stone walls with a natural channel bottom. The parking lot extends to the edge of the stream allowing cars to park in high hazard areas. Upstream of Greenwood Avenue, Tookany Creek flows adjacent to Wyncote Park. SEPTA buildings and a local restaurant across from Wyncote Park have experienced damage.



Figure 6: Inlet along Maple Ave. The inlets represent the natural low-point in this area.

The field inspection also included an area along North Avenue, upstream of the Jenkintown SEPTA station along Tookany Creek where industrial/commercial buildings received significant damage following the Tropical events of 2011. These properties are located upstream of where Tookany Creek makes a right angle, flows under the railroad tracks and makes an opposite right angle before continuing downstream.

September 29, 2012 (Saturday)

0930 High School Road: At the High School Road location, four structures are potentially subject to flooding with two of those structures significantly more susceptible than the others. The homes are located just downstream of the High School Road bridge. Upstream of this bridge is the Ogontz Field. Flooding in this area begins from backwater associated with the downstream Mill Road Bridge crossing as well as overtopping of the High School Road Bridge. Flooding also occurs from ponding within Ogontz Field as it drains through low points along High School Road between the houses. Residents interviewed indicated that the water behind the homes is relatively still during flood periods, “almost like a swimming pool.”



Figure 7: High water mark from the 2011 Events behind High School Road.

1030 Shoemaker Road: Along Shoemaker Road, approximately nine homes experience basement flooding to various degrees from Tookany Creek. Flooding also affects the municipal maintenance building, storage area and parking lot on the opposite side of the creek. In June 2008, in an attempt to alleviate some of the flooding issues, the Pennsylvania Department of

Environmental Protection (PADEP), Cheltenham Township and the Pennsylvania Fish and Boat Commission removed an old mill dam near these homes through a Delaware River Estuary Grant. The residents indicate they have not noticed a reduction in flood magnitude due to the dam removal, but have noticed an increase in deposition along the channel since the removal of the dam.

According to the residents, the frequency of the events has increased over the last 10 years. Along this reach of stream, the right bank (facing downstream) consists of a stone wall. The left bank is only partially contained by a similar wall.

However, the top of the left bank wall is lower than the right bank. The walls were constructed in the late 1960s following recommendations in a report prepared by a joint venture of George B. Mebus, Inc. Engineers, Glenside, Pennsylvania and Metcalf and Eddy Engineers, Boston Massachusetts.

The front of the properties along Shoemaker Road are elevated and slope downward near the backside of the structures exposing walk-out basements. The ground remains flat from the back of the homes until it reaches the creek. Immediately adjacent to the creek and behind the homes is an access road used by the residents to access garages and off-street parking.

1130 Mill Road: The Mill Road crossing over Tookany Creek causes backwater to affect upstream areas (High School Road). As this backwater increases in elevation, the water eventually overtops the banks near the bridge, causing flood damage to nearby residences and one business. Mill Road slopes down and away from the bridge forcing overflow towards the residences along Mill Road. Backwater effects from the downstream Harrison Ave crossing were not noted. Prior to the Township's installation of the temporary sanitary sewer bypass system, this area experienced significant problems with sewer backups.



Figure 8: A resident points out a high water mark from the 2011 events.



Figure 9: Wall adjacent to Tookany Creek overtopped in 2011.