Environmental Assessment

Pigeon Creek Flood Mitigation

Village of Thiensville, Ozaukee County, Wisconsin

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AHI	Architecture and Survey Inventory
APE	Area of Potential Effects
ASI	Archaeological Survey Index
BMP	Best Management Practice
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFS	cubic feet per second
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
CY	Cubic Yards
dB	decibel
DHS	Department of Homeland Security
DNL	Day/Night Average Sound Level
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHBM	Flood Hazard Boundary Map
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
HDI	Heritage Database Inventory
LOMR	Letter of Map Revision
LUST	Leaking Underground Storage Tank
NAAQS	National Ambient Air Quality Standards
NCA	Noise Control Act of 1972
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NO_2	Nitrogen Dioxide
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places

O_3	Ozone
OSA	Office of the State Archaeologist
OSHA	Occupational Safety and Health Administration
Pb	Lead
PDM	Pre-Disaster Mitigation
PM_{10}	Particulate Matter of 10 microns or less
RCRA	Resource Conservation and Recovery Act
ROW	Right-of-Way
SEWRPC	Southeastern Wisconsin Regional Planning Commission
SF	Square Feet
SHPO	State Historic Preservation Office
SO_2	Sulfur Dioxide
SWA	Solid Waste Act
TSCA	Toxic Substance Control Act
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
WDNR	Wisconsin Department of Natural Resources
WDOA	Wisconsin Department of Administration
WDOC	Wisconsin Department of Commerce
WHS	Wisconsin Historical Society
WEM	Wisconsin Emergency Management
WPDES	Wisconsin Pollution Discharge Elimination System
wsel	water surface elevation
WSRA	Wild and Scenic Rivers Act
WWI	Wisconsin Wetlands Inventory

1.1 PROJECT AUTHORITY

The Village of Thiensville, Ozaukee County, Wisconsin, applied for Pre-Disaster Mitigation (PDM) funding under the Disaster Mitigation Act of 2000 after flooding in 2002. FEMA grants funds under this program for mitigation measures, projects, or actions proposed to reduce risk of future damage, hardship, loss, or suffering from future disasters. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500 through 1508), and FEMA regulations for NEPA compliance (44 CFR Part 10), FEMA must fully understand and consider the environmental consequences of actions proposed for Federal funding. The purpose of this Environmental Assessment (EA) is to meet FEMA's responsibilities under NEPA and to determine whether to prepare a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS) for the proposed project.

1.2 PROJECT LOCATION AND SETTING

The Village of Thiensville is in Ozaukee County, approximately 15 miles north of downtown Milwaukee (Figure 1). The County is bordered on the east by Lake Michigan. The project site is located primarily in the Village of Thiensville, which lies at the confluence of the Milwaukee River and Pigeon Creek in the south central part of the County. Improvements are proposed along Pigeon Creek, from the Milwaukee River, through downtown Thiensville, to the Williamsburg neighborhood just northwest of downtown. This portion of the project area is surrounded by commercial and residential development. The water storage portion of the project lies within the City of Mequon, which completely surrounds the Village of Thiensville (see Figure 2). The proposed storage area is approximately 1.5 miles northwest of the Village of Thiensville, and is surrounded by recent subdivision development (see project area photographs in Appendix A).

1.3 PURPOSE AND NEED

The objective of FEMA's PDM program is to assist the community in mitigating conditions that could cause damage during future natural disasters. The Village has requested Federal funding under PDM to improve water conveyance along Pigeon Creek and create additional water storage, to protect surrounding homes and businesses from flooding, and to relieve sanitary sewer backup.

Ozaukee County contains Lake Michigan, the Milwaukee River, Cedar Creek, Pigeon Creek, and each related watershed. A consequence of being near these large bodies of water and large watershed is flooding, which the County sustains on an annual basis. Since 1993, over 2,900 businesses and residential structures have sustained damages exceeding $14 million countywide.

Since 1973, five separate flooding events have incurred specific consequences within the Village of Thiensville, four of which received a Presidential Disaster Declaration from FEMA. Major flooding occurred in downtown Thiensville in 1973, 1986, 1993, 1996, 1997, and 2002. Persistent heavy rains in each of these instances caused extensive flash flooding, resulting in roadway closures, flooded basements, and exterior property damage to businesses and residences. Claims ranged from minor basement leaking and backups to major claims for completely flooded basements and partially flooded first floors. In 1997, flooding shut down

Main Street and caused $777,000 in structural damage to businesses and residential structures. The Village also expended $54,000 to control floodwaters. In addition, a major interruption of electrical power resulted in additional basement flooding and failure of sanitary sewer lift stations, which caused sewage to back up into basements. Main Street was also closed in the 1996 event, causing structural damage and sanitary backup. The Village reported $12,900 in flood control costs, and $114,500 in damages was reported in the Williamsburg residential area. No other costs are available for the 1996 event, but the Village assumes additional costs were incurred due to damages to properties on Main Street.

All properties in Thiensville are at risk of basement sewage backups if the sanitary sewer system floods. This occurs every time Main Street floods, which is a regular occurrence during storm events. During storms, between 1 and 3 feet of water flows over Main Street in downtown Thiensville, flooding the sanitary sewer system. The floodwater infiltrates and fills the sanitary system, forcing raw sewage to back up into the basements of businesses and residences via toilets, shower drains, and burst sanitary pipes. In addition to property damage, sanitary sewer system backup poses a significant and widespread health and safety risk to residents when raw sewage backs up into their homes. This untreated sewage can also find its way into Pigeon Creek, representing an additional biological hazard to recreational activities and river habitats of both Pigeon Creek and the Milwaukee River. The Village has no municipal water system, therefore many drinking water wells in the Village are also susceptible to surface water pollution, and could be affected during storm events.

As a community, the Village also bears other costs that are more difficult to estimate in terms of damages. Businesses located along Main Street in downtown Thiensville have stated that business operations have suffered due to flooding. Floodwaters cause Main Street to be closed, compromising access to local businesses, and damaging business property and inventory. One of the two car dealers along Main Street has been completely shut down for one to two days on several occasions while waiting for floodwaters to recede. This particular dealer employs 50 people. Some businesses have flood response plans, which take effect when floodwaters begin to rise. Response actions have helped to ease flood damages to the property, but the business also bears the cost of moving inventory, lost business, and sandbagging materials. Additionally, not all businesses have the ability to implement such proactive response plans.

The primary source of flooding problems is bank overflows from the 6,927-acre tributary watershed of Pigeon Creek, which is a sub-watershed of the Milwaukee River Watershed. In addition, existing manmade structures such as bridges and culverts were not constructed to handle the current flood water levels. The purpose of the proposed project is to fulfill the need for more efficient (and cost-effective) handling of water in flood events in order to protect human health, safety and private property. This would protect surrounding homes and businesses from flooding, restore roadway access, and relieve sanitary sewer backups.

The CEQ has developed regulations for implementing NEPA. These Federal regulations require an evaluation of alternatives and a discussion of the potential environmental impacts of a proposed Federal action as part of the EA process. FEMA regulations, which establish the FEMA process for implementing NEPA, are set forth in 44 CFR, Subpart 10. This EA was prepared in accordance with FEMA regulations as required under NEPA. As part of this NEPA review, the requirements of other environmental laws and Executive Orders (EOs) are also addressed.

2.1 DEVELOPMENT OF ALTERNATIVES

The scope of work as proposed by the Village of Thiensville in the original PDM grant application involved conveyance improvements to Pigeon Creek, as well as upstream storage in a large basin known as Sileno Quarry. Wisconsin Department of Natural Resources (WDNR) staff subsequently reviewed the project in detail, and determined that use of the quarry presented some unique natural resource and permitting challenges (see Appendix B). Namely, Sileno Quarry and its inlet channel were determined by the WDNR to be navigable due to the direct connection of the quarry to Pigeon Creek. The WDNR also voiced concerns regarding fill of wetlands, quarry dredging, fish entrapment, and other environmental impacts. Sileno Quarry is also designated as a Natural Area by the Southeastern Regional Planning Commission, and the WDNR raised the associated issue of potential wildlife impacts. In addition, the cost of purchasing the property became unexpectedly higher than what was discussed at the time of the project application. Due to the high cost combined with the high potential for environmental impacts, the original project no longer provides a significant level of benefit, and is no longer considered for implementation.

To accomplish the purpose and need of the original project, an alternative storage site (Basin 2) was selected. The originally-proposed conveyance improvements to Pigeon Creek remain the same as originally proposed, and combined with Basin 2 make up the Preferred Alternative. The Basin 2 site has been evaluated and represents comparable benefits and improved costs to the original project proposed, and also meets the PDM program requirements concerning benefit, cost and scope of work.

2.2 ALTERNATIVE 1 – NO ACTION

Under the No Action Alternative, structural and storage improvements would not be made in the Village of Thiensville. During major storm events, residents and business owners would continue to experience flooded basements, property damage, compromised roadway access, and loss of business. Health and safety risks for area residents and aquatic environments as a result of sanitary sewer backup would also remain. In addition, downtown redevelopment proposed in the 2002 City of Mequon/Village of Thiensville "Town Center Plan" could not be implemented.

2.3 ALTERNATIVE 2 – CONVEYANCE IMPROVEMENTS AND STORAGE IN BASIN 2

Alternative 2 involves conveyance improvements along Pigeon Creek in downtown Thiensville, as well as upstream storage in the City of Mequon. The conveyance improvements include widening three reaches of the channel, reconfiguring riprap beneath the Main Street Bridge, removing existing car lot culverts and replacing them with a 60-foot stream channel, removing and replacing two bridges, and installing a new 70-foot pedestrian/utility bridge. With the proposed conveyance improvements and utilization of approximately 58 acre-feet of upstream storage, the target flood elevation of 659.5 feet can be reached in downtown Thiensville. This elevation was determined by the *Pigeon Creek Drainage Study* (Ruekert & Mielke, Inc., 1986), and the subsequent *Pigeon Creek Flood Study* (Ruekert & Mielke, Inc., March 2005), and verified in recent findings by Concord Ecological Engineering (February 2006). The proposed

storage component of the project is located approximately 1.5 miles northwest of Thiensville, and includes control of an existing road outlet structure to make maximum use of natural storage capacity to achieve the necessary water storage. The target elevation of 659.5 feet is the lowest possible flood stage that can be achieved in the downtown area because the backwater effect of the Milwaukee River in a 100-year event is equal to an elevation of 659.5 feet.

Channel Widening

The three reaches of creek channel proposed for improvement are all connected and begin at the mouth of Pigeon Creek at the Milwaukee River, and extend upstream to the abandoned railroad bridge west of Main Street at Riverview Drive that is now used as a trail bridge (see Figure 3). Reach 1 is the most downstream reach, extending from the mouth of the creek approximately 200 feet upstream to Green Bay Road. Reach 1 is lined with riprap and trees on the west bank and a stone retaining wall on the east bank, which narrows the natural channel. Reach 2 extends from the Green Bay Road Bridge upstream approximately 1,000 feet to the Main Street Bridge. Reach 2 has an existing retaining wall that runs along most of its west bank. The east bank has been gradually filled for use as parking lots for homes that have been converted into commercial businesses. Reach 3 extends from Main Street upstream about 600 feet to downstream of the abandoned railroad bridge. The most downstream section of Reach 3 has been enclosed in two 72-inch diameter culverts that cause a major obstruction to flow. The original channel has also been realigned and contains two 90-degree bends. In addition, portions of the original floodplain have been filled to construct parking lots for local businesses.

These three reaches would be widened and cleared of obstructions in order to restore the needed conveyance capacity of the original channel and floodplain. This conveyance capacity, combined with the project components detailed below, would minimize flooding in downtown Thiensville.

In Reach 1, the east bank would be excavated for a length of 300 feet, with a total of 500 cubic yards (CY) of excavation. This includes widening of the riprap channel under the Green Bay Road Bridge to match the proposed channel cross-section both upstream (Reach 1) and downstream (Reach 2) of the bridge. The retaining wall in this reach would also be modified to fit the widened channel. In Reach 2, approximately 6,000 CY would be excavated along 1,000 feet of the east bank. The existing retaining wall along the west bank would remain, and the east bank would be stabilized with a rock wall. In Reach 3, approximately 8,000 CY would be excavated along 600 feet of the east bank. The existing 72-inch culverts would be removed and replaced with a stream channel (discussed in detail in next section).

Wherever banks would be widened, the soil would be removed to provide a gradual slope ending with a rock wall to transition back to the existing topography. Appropriate ground plantings and matting would be used to stabilize disturbed areas. Bio-logs and rock riprap would be used at high velocity bends. The depth of the creek would not change in these areas. Proposed improvements would include the removal of existing culverts and rehabilitation of the creek channel. This rehabilitation would include removal of fill within the floodplain and reconnection of the floodplain and the reconstructed channel, where the existing culverts would be removed and the channel aligned to fit the culverts.

In each case, trees and brush would be cut down and removed, with special effort given to keeping larger more mature trees to maintain existing visual, shade and soil-anchoring functions

whenever feasible. Removed trees and brush would be replaced with plantings more native toa floodplain environment. Excavated soil would be hauled to upland areas. Excavated pavement and culverts would be disposed of or recycled per existing Village ordinances. No dewatering is anticipated for this project.

Construction equipment and materials would be stored in existing parking areas behind businesses along Green Bay Road and along Main Street, closest to points of construction. Construction of this element of the project would not affect traffic or compromise any roadways.

Removal of Culverts and Installation of Stream Channel, Installation of Pedestrian/Utility Bridge

In addition to bank widening in Reach 3, the existing two 72-inch culverts present in the car lot area would be removed and replaced with a 70-foot wide open stream channel. Channel installation would require approximately 4,800 CY of excavation.

Installing the open stream channel would permanently render a portion of the existing parking lot unusable for day-to-day functions of the car lot, and would also split the lot in two. As a result, a 70-foot pedestrian/utility bridge would be installed over the open channel. Installation of bridge footings would require an additional 20 CY of excavation. This bridge would not connect to any existing sidewalks or trails and would serve a sole purpose of providing dealership employees and customers access to both sides of the lot. It would also serve a utility purpose by being wide enough to move vehicles between both sides of the lot.

No vegetation would be affected by removing the culverts, as they are located in an asphalt parking lot. Some vegetation may be disturbed where the new channel connects to the existing channel. Any trees and brush would be cut down and grubbed out, with the exception of larger mature trees that would be maintained whenever feasible. Excavated soil would be hauled to upland areas, and excavated concrete and culverts would be disposed of or recycled per existing Village ordinances.

Construction equipment and materials would be stored on the existing car lot, requiring the owner to temporarily relocate inventory out of the work area. Construction of this element of the project would not affect traffic or compromise any roadways.

Replacement of Williamsburg Bridges

Both bridges along Williamsburg Road would be removed and replaced with bridges twice as wide, in the same style as the existing bridges. Excavation would be required for new bridge footings and widening of the approach channel to the widened part of the bridge, totaling approximately 500 CY. The existing roadway would stay the same, with the exception of about 50 feet of blending required on each side of the approach to the bridges. The bridge road elevations would not change.

Woody vegetation and grass would be affected by excavation. Vegetation would be grubbed out and excavated soil would be hauled to upland areas. Affected vegetation would be replaced with grass and appropriate ground cover.

Construction equipment and materials would be stored adjacent to the work site on the existing streets. Williamsburg Road is looped, so work would occur on only one bridge at a time to maintain continuous access to the area.

Water Storage

The proposed water storage area, identified for the purposes of this study as Basin 2, is located north of Bonniwell Road and east of Wauwatosa Road. This is a natural storage area that would be enhanced by adding a restrictor plate to the top 1.4 feet of the 5-foot by 10-foot box culvert located under Wauwatosa Road, and raising approximately 1,000 feet of Wauwatosa Road by between 3 inches and 11 inches (see Figure 4). The variation in road elevation is due to the existing uneven nature of the road, and to ensure that water is efficiently directed in the case of a larger flood event, minimizing impact to the road and its users.

The acquisition of flood easements in the existing wetland complex east of Wauwatosa Road and the addition of the restrictor plate to the existing culvert would allow for approximately 58 acre-feet of storage. This includes the consideration of natural storage on the west side of Wauwatosa (13 acre-feet) and the modified storage volume of 45 acre-feet on the east side of Wauwatosa; both of which are protected by existing agreements to ensure they will remain available for flood storage in the future. On the east side of Wauwautosa Road, the proposed 100-year floodwater surface elevation (wsel) will increase to approximately 778.00 feet, which is approximately 0.5 foot higher than the existing wsel of 777.6 feet (personal communication, Campbell, March 8, 2006). The increase in flood elevation, along with the existing storage at the site, will reduce the peak flow in Pigeon Creek by approximately 100 cubic feet per second (cfs), as described in the proposed WDNR effective model for Pigeon Creek. Increased water storage would be limited to the east side of Wauwatosa Road, within a new flood easement area.

The proposed raising of Wauwatosa Road would be accomplished within the existing roadway footprint. Minimal low-lying vegetation and grass would be affected by increasing the roadway elevation. Wetland vegetation is not anticipated to be affected during road-raising activities. The road elevation would consist mostly of asphalt road millings placed within the existing roadway right-of-way (ROW) and repaving the affected roads. Best management practices (BMPs) such as silt fences, silt curtains, erosion mats, and temporary seeding and riprap will be used during project construction. Non-paved areas would be restored with turf and/or similar vegetation where feasible.

Construction equipment and materials would be stored at the work site and traffic would be temporarily detoured for approximately three weeks onto adjacent roads.

2.4 ALTERNATIVE 3 – CONVEYANCE IMPROVEMENTS AND STORAGE IN BASINS 2, 3, 4 AND 5

Alternative 3 also involves conveyance improvements along Pigeon Creek in downtown Thiensville, as well as upstream storage in the City of Mequon. The conveyance improvements include widening of three reaches of the channel, removing existing car lot culverts and replacing them with a 60-foot stream channel, removing and replacing two bridges, and installing a new 70-foot pedestrian/utility bridge. The width of the stream channel through the car lot would be the same as Alternative 2; however it would be constructed with more of a side slope and less surface area on the bottom of the channel (trapezoidal shape vs. square), creating reduced capacity for water. Because the volume of the proposed stream channel is reduced from that of Alternative 2, and no widening or reconfiguration of riprap beneath the Main Street

Bridge is proposed, approximately 300 acre-feet of storage is needed to achieve the target flood elevation of 659.5 in downtown Thiensville, as determined by the *Pigeon Creek Drainage Study* (Ruekert & Mielke, Inc., 1986) and the subsequent *Pigeon Creek Flood Study* (Ruekert & Mielke, Inc., March 2005). Therefore, under Alternative 3, the proposed storage component requires using four water storage areas in the City of Mequon. The target elevation of 659.5 feet is the lowest possible flood stage that can be achieved in the downtown area because the backwater effect of the Milwaukee River in a 100-year flood event is equal to an elevation of 659.5 feet.

Channel Widening

The channel-widening component of this alternative would occur as described above under Alternative 2 in Reaches 1, 2 and 3. The three reaches would be widened and cleared of obstructions in order to restore the needed conveyance capacity of the original channel and floodplain. The difference between Alternatives 2 and 3 is that widening and riprap configuration beneath the Main Street Bridge is not proposed under Alternative 3. This conveyance capacity, combined with the improvements detailed below, would help to minimize flooding in downtown Thiensville.

Removal of Culverts and Installation of Stream Channel, Installation of Pedestrian/Utility Bridge

This component is also similar to Alternative 2, with exception of the width of the proposed stream channel and pedestrian/utility bridge. In addition to bank widening in Reach 3, the existing dual 72-inch culverts present in the car lot area would be removed and replaced with a 60-foot wide open stream channel with greater side slopes and less bottom surface area than Alternative 2 . Channel installation would require approximately 3,900 CY of excavation.

Installing the open stream channel would permanently render a portion of the existing parking lot unusable for storage, and would also split the lot in two. This would require installation of a 70-foot pedestrian/utility bridge over the open channel. Installation of bridge footings would require an additional 20 CY of excavation. This bridge would not connect to any existing sidewalks or trails, and would serve a sole purpose of providing dealership employees and customers access to both sides of the lot.

No vegetation would be affected by removing the culverts as they are located in an asphalt parking lot. However, some vegetation may be disturbed where the new channel connects to the existing channel. Any trees and brush would be cut down and grubbed out, with the exception of larger mature trees that would be maintained. Excavated soil would be hauled to upland areas and excavated concrete and culverts would be disposed of or recycled per existing Village ordinances.

Construction equipment and materials would be stored on the existing car lot, requiring the owner to temporarily relocate inventory out of the work area. Construction of this element of the project would not affect traffic or compromise any roadways.

Replacement of Williamsburg Bridges

The bridge replacement component of Alternative 3 would occur exactly as described under Alternative 2. Excavation would be required for new bridge footings and widening of the

approach channel to the widened part of the bridge, totaling approximately 500 CY. The existing roadway would stay the same, with the exception of about 50 feet of blending required on each side of the approach to the bridges. The bridge road elevations would not change.

Water Storage

As the open stream channel volume component of this alternative is reduced from that of Alternative 2, and widening and reconfiguring of riprap beneath the Main Street Bridge would not occur, additional storage is needed to achieve the target flood elevation of 659.5 in downtown Thiensville. Specifically, 300 acre-feet of storage would be required (Ruekert & Mielke, March 2005). This would be realized by using existing natural storage and creating additional storage in Basins 2, 3, 4, and 5 (see Figure 5). All four basins are located in low-lying areas that are generally farmed adjacent to tributaries of Pigeon Creek.

Improvements to Basin 2 would occur similarly to those described under Alternative 2, with control of the existing outlet. However, approximately 1,000 linear feet of Wauwatosa Road and 400 linear feet of Bonniwell Road would by elevated by one foot, to achieve 58 acre-feet of storage. To contribute to the 300 acre-feet of storage necessary under this alternative, an additional 100,000 cubic yards of upland excavation would also be required to achieve additional storage of 60 acre-feet, bringing the total proposed storage at Basin 2 to 140 acre-feet.

Basin 3 is located north of Bonniwell Road, approximately 0.4 mile directly west of Basin 2. Approximately 35 acre-feet of storage could be achieved at this site by controlling the existing outlet structure, and an additional 30 acre-feet of storage could be created by excavating approximately 50,000 cubic yards of soil. A 500-foot portion of Bonniwell Road would also be raised to avoid overtopping. The proposed storage at Basin 3 would total 65 acre-feet.

Basin 4 is located approximately 0.2 mile north of the intersection of Granville Road and Bonniwell Road, approximately 1.4 miles west of Basin 3. This basin has potential to store 60 acre-feet of water. Approximately 30 acre-feet of storage would be achieved by constructing a berm with a controlled culvert to be used as the basin control structure. An additional 30 acre-feet of storage could be created through excavation. The total proposed excavation is 100,000 CY. The proposed storage at Basin 4 would total 60 acre-feet. No roadway elevation is proposed.

Basin 5 is located at the southwest quadrant of Wauwatosa Road and Highland Road, approximately one mile south of Basin 2. Approximately 30 acre-feet of water storage would be achieved through controlling the existing culvert under Highland Road. No excavation or roadway elevation is proposed.

Low-lying vegetation and grass would be affected by increases in roadway elevation proposed for Basins 2 and 3. Vegetation would be grubbed out and any excavated soil would be hauled to upland areas. The road elevation would consist mostly of placing earthen fill within the existing roadway ROW and repaving the affected roads. Excavation at Basins 2, 3, and 4 would affect ground cover and wetland vegetation at each of the sites. BMPs such as silt fences, silt curtains, erosion mats, and temporary seeding and riprap as appropriate will be used during project construction to minimize erosion and water runoff. Non-paved areas would be restored with turf and/or similar vegetation where feasible.

Construction equipment and materials would be stored at the work sites. Traffic would be temporarily detoured for approximately three weeks onto adjacent roads during construction at Basins 2 and 3, where roadway elevation is proposed.

2.5 ALTERNATIVES CONSIDERED BUT DISMISSED

Sileno Quarry, located northwest of the Village of Thiensville in the City of Mequon, was considered as a water storage site. However, the Wisconsin Department of Natural Resources (WDNR) expressed concerns over use of the property, as described in Section 2.1. In addition, the cost of acquiring the property rose significantly from the time original estimates were established. For these reasons, this alternative was eliminated from further consideration.

An all-storage alternative utilizing seven basins in the City of Mequon was also considered. This included Basins 1 though 5, as well as two additional basins in the same general area, providing 1,135 acre-feet of water storage. This alternative would require significant land and easement acquisition, which would significantly increase the cost of the project. In addition, it would require significant work in wetland areas. For these reasons, the all-storage alternative was eliminated from further consideration.

A 100-foot stream channel was considered for replacement of the car lot culverts. However, negotiations with the property owner yielded a compromise of a 60-foot channel with improvements to the riprap configuration beneath the Main Street Bridge. This offered the same project benefits with less impact (loss of parking) to the property owner. For these reasons, a 100-foot stream channel was eliminated from further consideration.

3.1 PHYSICAL ENVIRONMENT

3.1.1 Geology, Seismicity, and Soils

Bedrock underlying Ozaukee County, including the project area, is primarily composed of Middle Paleozoic (Silurian, Devonian, and Mississippian) sedimentary rock formations, consisting primarily of dolomite and limestone in upper layers, and sandstone, siltstone, and shale in lower layers. Except for a few isolated spots where dolomite bedrock is exposed, the entire County is covered with glacial deposits (Ozaukee County, 2005).

Soils along Pigeon Creek within Reach 2 and 3 and the Williamsburg area are loamy, nearly level soils with relatively poor drainage from the Mussey, Sebewa and Fox series. In the area of Reach 1 and into Reach 2 channel improvements, soils are categorized as Wet Alluvial Land from the Wasepi series. This soil has a permanently high water table that is subject to frequent flooding. This soil type is typical on sandy outwash terraces along streams and drainage ways throughout the County (USDA, 1970).

Soils in the Basin 2 area are nearly level, organic and poorly drained mucky soils from the Houghton, Palms and Adrian series. The water table is at or near the surface for most of the year, and tends to pond after heavy rain events. These mucky soils are mixed with loamy, poor to moderately drained soils from the Dresden, Matherton and Sebewa series in the ponding area. These soils form partly on loamy material, and partly on calcareous outwash sand and gravel deposits (USDA, 1970).

Alternative 1 – No Action

The No Action Alternative would not impact geology, seismicity, and soils, as no construction is proposed under this alternative.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

It is not anticipated Alternative 2 would result in permanent, negative impacts on geology, seismicity, or soils in the project area. The project would improve the conveyance of floodwaters in Pigeon Creek, lowering flood levels and decreasing the duration of immersion. This would help decrease erosion of flooded soils.

Soil disturbances resulting from construction equipment traveling to and from the site may result in a temporary increase in surface soil erosion and compaction. The Village would use the WDNR's recently enacted Storm Water Management Technical Standards, which follow Wisconsin Administrative Code NR 151.31. BMPs for all components of the project would include using silt fences, silt curtains, erosion mats, and temporary seeding and riprap as appropriate. Earthwork would not be allowed during precipitation events. Additionally, exposed soils would be seeded with a mix comparable to what currently exists. Construction specifications would identify the specific seed mix to be used by the contractor. In addition, compacted soils would be loosened by disking or raking prior to seeding.

Alternative 2 would result in the excavation of over 20,000 cubic yards of soil material. The excavated material will go to a licensed landfill or a contractor site approved by the Wisconsin DNR.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4 and 5

It is not anticipated that Alternative 3 would result in permanent, negative impacts on geology, seismicity, or soils in the project area. Soil disturbances resulting from construction equipment traveling to and from the site may result in a temporary increase in surface soil erosion and compaction, and would be minimized through the use of BMPs as described under Alternative 2.

Alternative 2 would result in the excavation of over 270,000 cubic yards of soil material. The excavated material will go to a licensed landfill or a contractor site approved by the Wisconsin DNR.

3.1.2 Water Resources and Water Quality

Pigeon Creek within the Village of Thiensville is part of the Milwaukee River South Watershed, which covers approximately 168 square miles in Milwaukee and Ozaukee Counties. It is also part of the greater Milwaukee River Basin, which covers 694 square miles in Dodge, Fon du Lac, Milwaukee, Ozaukee, Sheboygan, and Washington Counties. The mouth of Pigeon Creek originates at the Milwaukee River within the Village of Thiensville.

Section 303(d) of the Federal Clean Water Act (CWA) requires each state to periodically submit a list of impaired waters to the Environmental Protection Agency (EPA) for approval. Impaired waters are those that are not meeting the state's water quality standards. States may measure water quality through a number of parameters, including examining fish and wildlife contaminants, water and sediment chemistry, biological integrity/physical habitat, and stream flow. Pigeon Creek within the Village of Thiensville is not included in the 303(d) list, and is therefore not considered an Impaired Water.

The WDNR issued a 2001 report entitled *State of the Milwaukee River Basin,* which provides detailed information about the health and quality of streams within each watershed contained in the basin. The report presents data on the existing and potential biological use supported by the stream. It also describes the types of water quality problems present and the probable sources.

Although not in violation of the state's water quality standards, types of water quality problems for the 3.8-mile stretch of Pigeon Creek from the Milwaukee River north through the Village of Thiensville are identified as bacteriological contamination, stream flow fluctuations caused by unnatural conditions, lack of habitat, fish migration interference and nutrient enrichment. According to the report, these problems are most likely caused by increasing development, hydrologic modification, barnyard runoff, cropland erosion and urban stormwater runoff. These problems are typical of surface water bodies within the Milwaukee River South Watershed (WDNR, 2001).

Potential water quality impacts as a result of any new project construction generally originate from the following:

- Erosion of exposed soils during construction;
- Reduced infiltration and increased runoff from the construction of new impervious surfaces;
- Pollutants from automobiles, such as oil, grease, and metals, that collect on impervious surfaces and are washed off by stormwater runoff;
- Increased stormwater runoff that overburdens existing drainage systems, causing flooding; and
- Fill or construction in floodplains, which affects flood levels in streams and rivers.

Both the WDNR and the United States Army Corps of Engineers (USACE) were contacted regarding the proposed project. The WDNR said it does not have any issues with the project at this time, but would be involved in further review of project specifications. WDNR staff has walked the corridor with a Village biologist and is interested in exploring ways to further enhance the creek corridor in the future. The WDNR has indicated that the project would need to go through the Chapter 30 permitting process, which protects lakes and rivers by regulating activities in and affecting Wisconsin waters, and would also require a Wisconsin Pollution Discharge Elimination System (WPDES) permit under NR 216 of the Wisconsin Administrative Code (see Appendix B).

The USACE anticipates that this project would qualify for Letter of Permission (for less than 2 acres of impact), which would be authorized under the provisions of Section 404. Waters of the United States in this project include Pigeon Creek and its associated wetlands, and the Milwaukee River and its associated wetlands (see Appendix B).

The proposed project would not increase the amount of impervious surface and would, in fact, help to decrease the overburden on existing drainage systems and the obstructions within Pigeon Creek that currently result in flooding and septic system backup during significant storm events. Erosion of exposed soils would be managed by BMPs as described in Section 3.1.1.

Potential sedimentation due to temporary construction impacts is discussed below. The proposed project does impact wetlands, which are discussed in Section 3.2.2.

Special Designation Areas

Pigeon Creek is not considered a Wild and Scenic River, under 16 USC Section 1273 of the Wild and Scenic Rivers Act (WSRA) (NPS, 2003). No further action is necessary under the WSRA or under the State-designated Wild and Scenic River program.

Alternative 1 – No Action

Under the No Action Alternative, no immediate impacts to water quality would occur. Periodic flooding and sanitary sewer backup during heavy rainfall events would still occur.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Conveyance elements of Alternative 2 propose improvements to Pigeon Creek, and require modifying the creek channel. These improvements would widen approximately 2,250 linear feet of creek bank, resulting in 100,000 square feet of soil removed. This, in addition to bridge capacity improvements in the Williamsburg area, removal of the car lot culverts and replacement with a stream channel, and increased upstream storage totaling 58 acre-feet, would reduce peak flows by approximately 100 cfs and decrease the flood stage to 659.5 feet. This alternative could result in decreased risk of flooding in downtown Thiensville and would not impose pollution or long-term sedimentation on Pigeon Creek.

Alternative 2 would incur temporary impacts on water quality as a result of construction grading, due to erosion of bare soils along the banks of the creek during construction. BMPs for erosion control during construction would be implemented as outlined in stormwater and erosion control plans. BMPs would include protecting erodible surfaces and avoiding construction during precipitation events. Both the Village of Thiensville and the City of Mequon have adopted land use plans and local ordinances that require that water quality and water quantity protections by designing them into any new developments. Both land use plans prevent development that would result in loss of floodplain storage areas and both plans also limit any increases in runoff from new development. Both plans also provide for protection of conservancy areas. Thiensville adopted a Model Construction Site Erosion Control and Storm Water Management Ordinance in June 2001. This ordinance has strict rules regarding construction that would be followed on this project. In addition, the Village would use the WDNR's recently enacted Storm Water Management Technical Standards, which follow Wisconsin Administrative Code NR 151.31. Each of these ordinances and codes would be adhered to during project construction.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4 and 5

Alternative 3 has the potential for minor impacts on water quality as a result of construction grading, which may cause temporary sedimentation of sewer systems due to erosion of bare soils. BMPs for erosion control during construction would be implemented as described above under Alternative 2. Permits would also be obtained as described under Alternative 2.

3.1.3 Floodplain Management (EO 11988)

Floodplain refers to the 100-year floodplains as defined by FEMA. They are shown on Flood Insurance Rate Maps (FIRMs) or Flood Hazard Boundary Maps (FHBMs) for all communities participating in the National Flood Insurance Program (NFIP).

The 100-year floodplain designates the area inundated during a flood that has a one percent chance of occurring in any given year. FEMA also identifies the 500-year floodplain, which designates the area inundated during a flood that has a 0.2 percent chance of occurring in any given year.

EO 11988 directs Federal agencies to take action to minimize occupancy of and modification to floodplains. Specifically, EO 11988 prohibits FEMA from funding construction in the floodplain unless there are no practicable alternatives. FEMA regulations for complying with EO 11988 are promulgated in 44 CFR Part 9. FEMA applies the Eight-Step Planning Process as required by regulation to meet the requirements of EO 11988 (see Appendix C).

All of the proposed conveyance improvements to Pigeon Creek would take place within the 100-year floodplain of the Village of Thiensville (see Figure 6). The proposed water storage area does not lie within the Flood Insurance Study (FIS)-mapped 100-year floodplain within the City of Mequon.

Alternative 1 – No Action

No occupancy or direct modification to the 100-year floodplain would occur; therefore, EO 11988 is not applicable.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Alternative 2 would occupy and directly modify the 100-year floodplain. All of the proposed conveyance improvements to Pigeon Creek would increase capacity of the creek and would reduce the size of the floodplain by approximately 20 +/- acres. Normally, this situation would cause downstream concerns; however due to the size and resulting timing of the peak flows in the upstream Milwaukee River Watershed (over 600 square miles) and Pigeon Creek sub-watershed (12.7 square miles), there would be no downstream flood level increases. This is because the Milwaukee River flood stage occurs two days later, and the Milwaukee River takes precedence over Pigeon Creek. As an added benefit, upstream storage would reduce peak flows by approximately 100 cfs, resulting in a reduction from 2,284 cfs to approximately 2,187 cfs at the confluence with the Milwaukee River.

By reducing the size of the floodplain through the conveyance improvements and 58 acre-feet of upstream storage, the project could reduce the possibility of continued flooding to at least eight repetitive loss properties by removing them from the floodplain.

A Letter of Map Revision (LOMR) from FEMA and a Floodplain Impact Notification for the WDNR would be required for modifications to the 100-year floodplain. The Village of Thiensville is in the process of preparing information for these required submittals. In addition, the project must comply with the Village of Thiensville and Ozaukee County Floodplain Ordinances, as well as NR 116 of the Wisconsin Administrative Code. As proposed, the project is in compliance with each of these ordinances and codes because it does not cause measurable increases to the 100-year profile of the floodplain.

Although the Basin 2 area is not in a mapped floodplain, the flood elevation would be increased by 0.5 foot in a 100-year flood event, causing a temporary flooding of the wetland area. No structures would be affected by this temporary increase, as the Basin 2 area is currently zoned conservancy. Though the purpose of this project is to alleviate future flooding, the Village of Thiensville understands that it is possible that flooding will occur. FEMA and the State of Wisconsin are not responsible for any damages that may occur due to flooding and will not be liable for any such damages. This project would be approved on the best available engineering information available at the time of project review and implementation. The Village is in the process of obtaining flood easements from property owners in vicinity of Basin 2, to ensure that the area will remain available for flood storage in the future. A copy of the draft easement is in Appendix D.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4 and 5

Alternative 3 would also occupy and directly modify the 100-year floodplain as described under Alternative 2. None of the proposed storage areas are within the 100-year floodplain.

By reducing the size of the floodplain through the conveyance improvements and 300 acre-feet of upstream storage, the project could reduce the possibility of continued flooding to at least eight repetitive loss properties by removing them from the floodplain.

A LOMR from FEMA and a Floodplain Impact Notification for the WDNR would be required for modifications to the floodplain. In addition, the project must comply with the Village of Thiensville and Ozaukee County Floodplain Ordinances, as well as NR 116 of the Wisconsin Administrative Code. To achieve this, flooding easements must be obtained for all measurable increases to the 100-year profile of the floodplain for the project to be approved.

3.1.4 Air Quality

The Clean Air Act of 1970 (CAA), as amended, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The CAA establishes two types of national air quality standards: primary and secondary. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, visibility, and damage to animals, crops, vegetation, and buildings.

The EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants, which are called "criteria" pollutants: sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), particulate matter of 10 microns or less (PM_{10}), and ozone (O_3).

The EPA has designated specific areas throughout Wisconsin as NAAQS attainment or non-attainment areas. Non-attainment areas are those that either do not meet, or contribute to ambient air quality in a nearby area that does not meet, the national primary or secondary air quality standards for a pollutant. According to the EPA, Ozaukee County is in attainment for five of the six criteria pollutants. The County is not in attainment for ozone; this is attributed to the Milwaukee-Racine area (EPA, 2004).

Alternative 1 – No Action

No construction activities would take place under this alternative; therefore, there would be no impact to air quality.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Implementation of Alternative 2 would involve limited use of heavy construction equipment, such as backhoes, front-end loaders, cranes, and equipment trucks. The duration of the proposed project activities is anticipated to be approximately 7 months.

Heavy construction equipment is a source of fugitive dust emissions that may have a temporary effect on air quality. Emissions occurring during construction would be associated with earth moving (grading). Dust emissions can vary from day-to-day, depending on the level of activity, the specific operations, and weather. Emissions from fuel-burning internal combustion engines (heavy equipment and earth-moving machinery) could temporarily increase the levels of volatile organic compounds and some of the priority pollutants, including CO, NO_2, O_3, and PM_{10}.

To mitigate for potential air quality impacts from fugitive dust and equipment emissions, vehicle engines would be kept in good repair and turned off while not in use, and the project area would be watered in dry conditions. The same measures would also be taken in the identified construction staging areas.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4 and 5

Implementation of Alternative 3 would involve limited use of heavy construction equipment, as described above under Alternative 2. The duration of the proposed project activities is anticipated to be approximately 7 months.

Heavy construction equipment is a source of fugitive dust emissions that may have a temporary effect on air quality. Emissions occurring during construction would be associated with earth-moving (grading). Dust emissions can vary day-to-day, depending on the level of activity, the specific operations, and weather. Emissions from fuel-burning internal combustion engines (heavy equipment and earth-moving machinery) could temporarily increase the levels of volatile organic compounds and some of the priority pollutants, including CO, NO_2, O_3, and PM_{10}.

Mitigation measures to control fugitive dust emission would be the same as those described under Alternative 2.

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 Terrestrial and Aquatic Environment

Terrestrial Environment

Biologists from the Southeast Wisconsin Regional Planning Commission (SEWRPC) conducted a field inspection of the Pigeon Creek portions of the project on June 9, 2005. In addition, an ecologist representing the Village also walked the project site with WDNR staff on June 12, 2005 to discuss removal of vegetation in areas proposed for channel widening along the banks of Pigeon Creek, and in vicinity of Basin 2. According to these site visits and a preliminary vegetation survey (SEWRPC, 2005), the banks of the creek are predominantly vegetated with sago pondweed *(Potamogeton pectinatus)*, Kentucky bluegrass *(Poa pratensis)*, and Cottonwood *(Populus deltoids)*. According to the full SEWRPC survey, invasive/non-native species account for an average of 27 percent of vegetation along the creek. Vegetation at the Basin 2 site is predominantly wetland vegetation, as described below under Aquatic Environment.

Terrestrial wildlife in vicinity of the conveyance improvements include mammals such as white-tailed deer (*Odocoileus virginianus*), Eastern cottontail rabbit *(Sylvilagus floridanus)*, gray squirrel *(Sciurus carolinesis)*, and raccoon (*Procyon lotor*), which likely use the site for movement between wooded areas. Various birds will also move through the area as habitat is

suitable. Various songbirds were the only wildlife observed during the site visit. Terrestrial wildlife in vicinity of Basin 2 includes white-tailed deer, Eastern cottontail rabbit, raccoons, striped skunks (*Mephitis mephitis)*, opossum *(Didelphis virginiana)*, and woodchucks *(Marmota monax)*. Coyotes *(Canis latrans)* are also well-documented near the site. Smaller predators commonly include least weasel *(Mustela nivalis)*, short-tailed weasel/ermine *(Mustela erminea)*, and muskrat *(Ondatra zibethicus)*. Numerous species of non-migratory or semi-migratory birds were also observed on the site, including common grackles *(Quiscalus quiscula)*, red-winged blackbirds *(Agelaius phoeniceus)*, and other songbirds. Various hawk species are also common.

Aquatic Environment

A majority of the proposed project takes place along the banks of Pigeon Creek, which commonly contains aquatic species such as Green sunfish *(Lepomis cyanellus)*, Common shiner *(Notropiscornutus)*, White sucker *(Catostomus commersoni)*, Blacknose dace *(Rhinichthys atratulus)*, and various macroinvertebrate varieties. The fringe area of the creek is also considered wetland. Some plant species observed along the wetland edge of the creek included Dames rocket *(Hesperis matronalis),* Garlic mustard *(Alliaria officianalis),* and curly-styled wood sedge *(Carex rosea)*. These areas likely provide temporary aquatic habitat, primarily in the spring, to species such as wood ducks, amphibians (frogs, toads, and salamanders), reptiles (snakes and turtles), and songbirds.

The WDNR issued a 2001 report entitled *State of the Milwaukee River Basin,* which provides detailed information about the health and quality of streams within each watershed contained in the basin. The report presents data on the existing and potential biological use supported by the stream. It also describes the types of water quality problems present and the probable sources. The report states that the 3.8-mile stretch of Pigeon Creek from the Milwaukee River north through the Village of Thiensville is a warm water sport fish community, capable of supporting and/or serving as a spawning area for such fish. If this stretch of the creek was well managed and pollution sources were controlled, it would have potential to be a warm water forage fish community, capable of supporting an abundant diverse community of forage fish and other aquatic life.

The Basin 2 area contains many wetland species, dominated by common occurrences of *Typha spp.,* with Northern water-plantain *(Alisma triviale),* Lesser duckweed *(Lemna minor),* and Softstem-bulrush *(Scirpus validus).* Wetland impacts are discussed in Section 3.2.2.

Alternative 1 – No Action

Under this alternative, no changes to the existing terrestrial or aquatic environment would occur.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Terrestrial Environment

The effects of Alternative 2 would include disturbances to terrestrial (floodplain) habitat during project implementation. Existing trees and shrubs in the areas of channel widening would be removed to complete this alternative. This removal would be consistent with the overall restoration strategy associated with the conveyance improvements. Existing vegetation provides microhabitat elements and shading for the stream corridor, and the first priority of restoration

would be to minimize activity that would impact these functions. Functions provided by existing smaller vegetation would be replaced through restoration planting and vegetation management. Functions provided by larger trees are more difficult and take longer to replace. Therefore, care would be taken to minimize the impact to these larger ("monument") trees in order to retain their vital functions. Prior to construction, an additional site investigation would be performed to identify monument trees. The location and importance of these trees would be accounted for in the final design of the channel improvements. Every attempt to leave islands of undisturbed mature vegetation would be made.

The existing floodplain is inundated with debris and invasive species. The function of the floodplain would be improved after constructing the conveyance improvements by reconnecting the floodplain with the main channel of the creek. Improved floodplain health would be developed by creating topographic complexity within the reconstructed floodplain, installing large woody debris in the floodplain, and revegetation using native successional species such as silver maple *(acer saccanium L.)*, sugar maple *(acer saccanium)*, red-dosier dogwood *(cornus stolonifera)*, black willox *(salix nigra)*, and eastern cottonwood *(populus deltoids)*. There would be a focus on placing fewer, larger trees that would increase the survival rate of specific trees and provide aesthetic and natural functions more quickly than planting numerous smaller trees.

Roadway slopes at the Basin 2 site would be restored to their current condition after roadway elevation is completed.

Effects to the terrestrial environment would be temporary until vegetation becomes reestablished. The incidental take of wildlife could be minimized by removing tree and shrub vegetation prior to April 1 and/or after July 15 to avoid migratory bird nesting periods. It is not anticipated that any vegetation would be removed from construction staging sites as a result of the proposed project. However, heavy construction equipment would compact soils in the project area, thereby affecting vegetation. Soils compacted by construction machinery would be loosened by methods such as disking or raking, and re-seeded to existing conditions. Any plant material removed from the site would be taken to a licensed landfill or a contractor site approved by the Wisconsin DNR. This condition would be incorporated into construction specifications for the project. In addition, the Village will pass an ordinance detailing a regular plan for monitoring and removal of debris and invasives in the project area. Project areas would be monitored annually at minimum, in mid-summer to early fall. Overall, the terrestrial environment would be enhanced by the reintroduction of native/non-invasive species along the banks of Pigeon Creek.

Aquatic Environment

Temporary impacts to aquatic habitats would occur in the downtown Thiensville area. These impacts would last for the duration of construction and would include removal of vegetation (habitat) and short-term sedimentation of the creek due to soil erosion. The proposed project would provide a variety of benefits to fish, other aquatic life, and wildlife (Wawrzyn, personal communication, December 12, 2005). These benefits include:

- Improvement of channel (bed and bank) stability by providing bank-forming flows with more frequent access to the floodplain
- Provision of additional in-stream cover for fish and wildlife

- Removal of aquatic life and wildlife migration barriers (especially in the Green Bay Road area)

In terms of fish spawning, the WDNR has indicated that once the floodplain and wetland corridor along Pigeon Creek are hydrologically connected as a result of the proposed project, Lake Michigan potadromous (migration restricted to fresh water) fish and Milwaukee River resident fish would be able to access historical spawning grounds.

In the proposed Basin 2 area, surface water would be present for a longer duration (approximately 12 hours) after a significant storm event as a result of the proposed project. Plant species in the Basin 2 area were evaluated against flooding/fluctuation tolerances, and it was determined that approximately 0.5 foot of additional water over 12 additional hours in a 100-year event would not have a noticeable impact on existing wetland vegetation (Shaw and Schmidt, 2003).

The proposed improvements would allow for vegetation within the Pigeon Creek floodplain to withstand shorter durations of immersion. BMPs such as silt fences and curtains, erosion mats, and temporary seeding and riprap would be used to control erosion in both the downtown Thiensville and Basin 2 areas.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

The effects of Alternative 3 would include temporary disturbances to terrestrial habitat during project implementation. Existing trees and shrubs along the roadways would be removed to complete this alternative. It is not anticipated that any vegetation would be removed from construction staging sites as a result of the project. Trees and other vegetation would be replaced as described under Alternative 2.

Effects to the terrestrial environment would be temporary until vegetation becomes reestablished. The incidental take of wildlife could be minimized by removing tree and shrub vegetation prior to April 1 and/or after July 15 to avoid migratory bird nesting periods. It is not anticipated that any vegetation would be removed from construction staging sites as a result of the proposed project. However, heavy construction equipment would compact soils in the project area, thereby affecting vegetation. Soils compacted by construction machinery would be loosened by methods such as disking or raking, and re-seeded to existing conditions. Any plant material removed from the site would be taken to a licensed landfill or a contractor site approved by Wisconsin DNR. This condition would be incorporated into construction specifications for the project. In addition, the Village will pass an ordinance detailing a regular plan for monitoring and removal of debris and invasives in the project area. Project areas would be monitored annually at minimum, in mid-summer to early fall. Overall, the terrestrial environment would be enhanced by the reintroduction of native/non-invasive species along the banks of Pigeon Creek.

Aquatic Environment

Temporary impacts to aquatic habitats would occur. These impacts would last for the duration of construction and would include removal of vegetation (habitat) and short-term sedimentation of the creek. This change is not anticipated to have negative long-term consequences on aquatic resources. The proposed project would provide a variety of benefits to fish, other aquatic life and wildlife, as described under Alternative 2.

Temporary impacts to the aquatic environment would be minimized by implementing the measures described under Alternative 2.

3.2.2 Wetlands (EO 11990)

A wetland is defined by State and Federal regulations as an area that exhibits three distinct characteristics: 1) hydric soils; 2) inundation or saturation at or near the ground surface for a period of the growing season; and, 3) a prevalence of vegetation adapted to wet soil conditions. Wetlands are recognized as having important functions, including flood storage, water quality, wildlife and fisheries habitat, vegetation diversity, shoreland protection, aesthetics, and public recreation, resulting in their protection by local, State, and Federal regulations. These regulations require that wetland impacts be avoided or minimized to the extent feasible.

Under EO 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and preserve and enhance their natural and beneficial values. If a Federal action has the potential to impact jurisdictional waters of the United States as defined by Section 404 of the Federal CWA, the USACE is contacted for appropriate permitting requirements. Section 404 of the CWA authorizes the USACE to issue permits, after notice and opportunity for public hearings, for the discharge of dredged or fill material into waters of the United States at specified disposal sites. The WDNR has regulatory authority over activities within selected wetlands and waters, as identified on wetland maps published by the WDNR. The Village of Thiensville and City of Mequon have regulatory authority for all wetlands within each respective legal boundary.

FEMA applies the Eight-Step Planning Process as required by regulation to meet the requirements of EO 11990. This step-by-step analysis is included in Appendix C of this document.

Wisconsin State wetland policy is set forth in administrative rule NR 103 as a set of water quality standards. Although these are applicable to all WDNR actions, they mostly guide the water quality certification process (NR 299). The standards call for a "sequencing" process similar to that of the EPA under Section 404 (b)(1). Only after the NR 103 sequencing steps have been taken (avoid, then minimize) can mitigation be offered as part of an application for activities in wetlands. Mitigation is not required for permitted activities that impact wetlands.

Wetlands in the downtown Thiensville area were identified by using Wisconsin Wetlands Inventory (WWI) maps, and were confirmed by SEWRPC during a field investigation on June 9, 2005. Wetland 1 expands out from Pigeon Creek, and is located between the railroad corridor and the eastern Williamsburg Bridge (see Figure 3). This wetland is classified on the WWI as Forested, broad-leaved deciduous, wet soil/palustrine wetland (map code T3K). SEWRPC also identifies all areas along Pigeon Creek as fringe wetlands, which are associated with the creek's edge and are below the ordinary high water mark as determined by the WDNR. These are classified as open water wetlands. Typical vegetation includes sago pondweed *(Potamogeton pectinatus)*, Kentucky bluegrass *(Poa pratensis)*, and Cottonwood *(Populus deltoids)* in the creek area. Wetland 1 is predominantly vegetated with green ash *(Fraxinus pennsylvanica)*.

Wetlands in the vicinity of the water storage area were identified from aerial photography and WWI maps. Stewardship plans prepared for adjacent developments were also utilized (Cedarburg 2001 and 2002). The presence and nature of these wetlands was confirmed by a site visit by the Village and the WDNR on June 12, 2005 (see photos in Appendix A).

In the Basin 2 area, there is a wetland area on the east side of Wauwatosa Road that lines the adjacent ditch and stretches eastward toward the Hawks Landing development. These wetlands are identified on the WWI as scrub/shrub broad-leaved deciduous (S3) and emergent/wet meadow, persistent, wet soil, palustrine (E1K). These wetlands are associated with an intermittent stream, and consist of large areas of shallow marsh, with some areas of sedge meadows, wet meadows, shrub-carr, and lowland forest. The marsh area is dominated by cattails, while the sedge meadows are dominated by common tussock sedge and Canada bluejoint. The wet meadow areas are somewhat degraded and dominated by reed canary grass. The shrub-carr area is dominated by various viburnums, while the lowland forest is dominated by willows (Cedarburg, 2002). Some areas of the wetlands appeared to be storing shallow levels of water at time of the site visit. In other areas, standing water is most likely only present during floods and snowmelt. The outlet to this wetland complex is located under Wauwatosa Road, approximately 650 feet north of the intersection with Bonniwell Road. This connects to the wetland complex on the west side of Wauwatosa Road.

Both the WDNR and the USACE were sent information describing and illustrating the proposed project. The WDNR said it does not have any issues with the project at this time, but would be involved in further review of project specifications. The WDNR has indicated that the project would need to go through the Chapter 30 permitting process, which protects lakes and rivers by regulating activities in and affecting Wisconsin waters (see Appendix B). The WDNR does not require mitigation for wetland impacts, but defers mitigation requirements to the USACE.

The USACE anticipates that this project would qualify for a Letter of Permission, which would be authorized under the provisions of Section 404. A Letter of Permission is the appropriate permit level because total impact to all areas under USACE jurisdiction is estimated at less than 2 acres (Gruber, personal communication, February 22, 2006). Waters of the United States in this project include Pigeon Creek and its associated wetlands, and the Milwaukee River and its associated wetlands (see Appendix B).

Alternative 1 – No Action

Under this alternative, no changes to the existing wetlands would occur.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Minor wetland impacts are anticipated in the downtown Thiensville portion of the project. Wetland 1 and creek channel fringe wetlands would be temporarily impacted by placement of bridge footings, however total excavation would exceed the fill (500 CY excavation vs. 100 CY fill for bridge footings). Minimal sedimentation impacts may also occur to Wetland 1 during construction of the eastern Williamsburg Bridge. There is no bank excavation proposed in vicinity of Wetland 1. Vegetation would be replaced with native species to restore the area post-construction, and no long-term impacts are anticipated. The open water wetlands along the creek edges would also be temporarily impacted in Reaches 1, 2, and 3, while channel excavation is taking place. These impacts would be temporary and would only last the duration of project construction. BMPs such as silt fences, silt curtains, erosion mats and temporary seeding and riprap would be used to control erosion. No fill would take place in the open water wetlands along the creek edges. These wetlands would be expanded in the areas proposed for excavation,

and would be allowed to revegetate naturally to their pre-project state. All restoration areas would be monitored annually at minimum, in mid-summer to early fall.

At the Basin 2 site, disturbance would be limited to installing a plate on the top portion of the existing 5'x10' concrete box culvert and raising Wauwatosa Road. The roadway work would take place within the approximately 60-foot wide disturbed area that is now paved road, shoulder, and the already filled area to the edge of the wetland. The right-of-way is a total of 130 feet wide, measuring 65 feet on either side of the roadway centerline. The existing wetland would not be directly impacted. BMPs would be used as described above to protect the wetland from possible erosion and sedimentation during the process of elevating the roadway.

By obtaining flood easements and adding a restrictor plate to the top portion of the culvert under Wauwatosa Road, and raising approximately 1,000 feet of Wauwatosa Road, more than 58 acre-feet of temporary storage could be achieved. This would occur by backing up the 100-year flood wsel to approximately 778.00 feet, which is an increase of approximately 0.5 foot higher than the existing wsel of 777.6 feet (Campbell, personal communication, March 8, 2006).

It is not anticipated that the wetlands would be negatively impacted by the proposed increase in wsel. The base hydrograph for the 100-year flow has a duration of approximately 24 hours (WDNR, April 2005). According to subsequent analysis completed by Ruekert & Mielke, restricting the culverts lengthens the hydrograph by approximately 12 hours and raises the maximum water level by approximately 0.5 feet. Typical storm flows with yearly recurrence intervals and associated water levels would not be affected, because the lower portions of the existing culverts would not be modified. The restrictor plates would only cover the top portion of the culvert. Plant species in the Basin 2 area were evaluated against flooding/fluctuation tolerances, and it was determined that approximately 0.5 foot of additional water over 12 additional hours in a 100-year event would not have a noticeable impact on existing vegetation (Shaw and Schmidt, 2003). Wildlife would be able to utilize adjacent areas in the event of major flooding, and would also not be significantly impacted. In addition, temporary flood storage would not affect adjacent residential homes. Conditions, including quality of water entering the wetlands, would be very similar to 100-year events that have flooded the area in the past.

The project would be subject to the Section 30 permitting process through the WDNR, and the Section 404 permitting process through USACE. Construction activities would require a permit from the City of Mequon. The Village of Thiensville is in the process of preparing information for permit submittal. The Village of Thiensville and the City of Mequon met to discuss the project on April 25, 2005, and visited the proposed Basin 2 storage site. The City of Mequon is in agreement that this is the most appropriate site for temporary storage and will continue to work with the Village throughout the project process. Flood easements are being obtained from local property owners in vicinity of Basin 2, to preserve the area for future flood storage use. A copy of the draft easement is in Appendix D.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

Alternative 3 would cause the same temporary wetland impacts as described under Alternative 2 in the downtown Thiensville area. However, construction of the storage component would impact a minimum of approximately 0.7 acre of wetlands. Basins 2, 4, and 5 all contain wetlands.

The project would be subject to the Section 30 permitting process through the WDNR, and the Section 404 permitting process through USACE. Construction activities would require a permit from the City of Mequon. The Village of Thiensville is in the process of preparing information for permit submittal. The Village of Thiensville and the City of Mequon met to discuss the project on April 25, 2005 and visited the proposed storage site. The City of Mequon is in agreement that this is the most appropriate site for temporary storage and will continue to work with the Village throughout the project process.

3.2.3 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 requires Federal agencies to determine the effects of their actions on threatened and endangered species of fish, wildlife, and plants and on their habitats, and to take steps to conserve and protect these species.

The WDNR Heritage Database Inventory (HDI) is a statewide inventory of known locations and conditions of rare and endangered species. These resources are listed by township. A general review of this database indicated 16 known resources in the project area township, including two birds, one community, five fish, one reptile, and seven plants. Further information by section was obtained from a WDNR map of Ozaukee County, which utilized NHI data to show occurrences of aquatic and/or terrestrial resources by township section. This map revealed that Section 3 and 4, which contain the Basin 2 area, have potential occurrences that are reported only at the township level. Sections 22 and 23, which contain the downtown Thiensville portion of the proposed project, have known occurrences of aquatic resources, and also have potential occurrences that are reported only at the township level. As this data is only listed down to township level and/or section level, further coordination is required to determine if any of these species occur within the limits of the proposed project, and what types of species would be affected (if any). An Endangered Species Impact Review request was submitted to the WDNR in June 2005. Comments from the United States Fish and Wildlife Service (USFWS) were also requested in June 2005.

A response from the WDNR Bureau of Endangered Resources (BER) was received July 28, 2005 for the Basin 2 area, and August 24, 2005 for the downtown Thiensville area. There are state-listed species in vicinity of the project site, however the WDNR BER prohibits the release or reproduction of the location of sensitive ecological resources in any publicly disseminated documents. Therefore, specific names of species will not be given in this EA.

A response from the USFWS was received July 27, 2005. USFWS records indicate there are no federally-listed threatened or endangered species or critical habitat present at the project site (see Appendix B).

Alternative 1 – No Action

Under this alternative, no impacts to threatened and endangered species would occur.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

According to the WDNR BER, there are two state-listed fish species, six plant species and one snake species that have been recorded in the vicinity of the proposed downtown Thiensville

improvements. To avoid the two fish species, work that would impact water quality or be completed in-stream would be conducted outside of fish spawning times as determined by the WDNR. The plant species have not been observed on the project site and habitat does not appear suitable, therefore further action is not required. Habitat in the project area has been assessed and determined suitable for the snake species. As directed by the WDNR BER, presence/absence surveys are currently being undertaken to determine if the snake is present within the project area. If snakes are found, a Conservation Plan detailing habitat restoration and snake avoidance will be submitted to the WDNR BER for final approval. The natural community is a wooded area identified as important to Pigeon Creek water sources. This community would not be affected by the proposed project, therefore no further action is required.

The WDNR BER has indicated there are five state-listed plant species, one snake species, and one natural community that have been recorded in the vicinity of the Basin 2 area. The plant species have not been observed on the project site and habitat does not appear suitable, therefore further action is not required. Habitat in the project area has been assessed and determined suitable for the snake species. Actions are proceeding as described above for the downtown Thiensville area.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

The presence of threatened and endangered species in vicinity of this alternative is the same as described above under Alternative 2, with the addition of similar species found in the Basins 3, 4, and 5 areas.

3.3 HAZARDOUS MATERIALS

The Resource Conservation and Recovery Act (RCRA) defines hazardous wastes as "a solid waste, or combinations of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of or otherwise managed." While the definition refers to "solids," it has also been interpreted to include semisolids, liquids, and contained gases (Wentz, 1989).

Hazardous materials and wastes are regulated in Wisconsin through a combination of federally mandated laws and State laws, as enforced by the WDNR and Department of Commerce (WDOC). The WDNR is responsible for establishing investigation and remedial action requirements for contamination in the NR 700 series of environmental rules in the Wisconsin Administrative Code, and overseeing cleanups at petroleum tank discharges that include high risk factors as determined by those rules. The WDOC is responsible for underground and aboveground tank standards, as well as oversight of cleanups at petroleum tank discharges that do not include high risk factors as defined by state rules. Federal regulations governing hazardous wastes include RCRA; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Solid Waste Act (SWA); and the Toxic Substance Control Act (TSCA).

To determine the presence and approximate location of known hazardous materials in the vicinity of the proposed project, a database search was conducted by FirstSearch Technology Corporation (FirstSearch, 2005). The database search queried multiple Federal, State, and local hazardous materials and underground storage tank (UST) databases to identify sites of potential concern. Identified USTs were also cross-checked in the WDOC and WDNR databases (WDOC, 2005; WDNR BRRTS, 2005).

There are seven leaking underground storage tank (LUST) sites within 0.25 mile of the proposed project site, however all have been closed by the WDNR Bureau for Remediation and Redevelopment, meaning investigative and/or cleanup action at the site is no longer required. Each of these LUST sites contained petroleum products. Five of the sites present a low risk of contamination according to the WDNR, The two remaining sites are located approximately 0.20 mile south of the confluence of Pigeon Creek with the Milwaukee River, and are considered a high risk for contamination. Both of these LUST sites contained gasoline, and did result in some groundwater and soil contamination before being closed in April and December of 2000.

Based on review of topographic maps and FirstSearch mapping of the LUST sites, the five sites presenting low risk are located west of Pigeon Creek and would drain west/southwest to the creek. No excavation work is proposed on the western banks in this area, therefore risk of encountering contamination is considered low. The two sites representing high risk of contamination are located south of the project area, approximately 350 feet west of the Milwaukee River. Based on review of topographic maps, drainage in this area travels to the Milwaukee River, and would not affect the project area.

No subsurface materials testing was conducted in the project area as part of this analysis. Conclusions are based on FirstSearch review, WDOC and WDNR database search, and review of topographic maps and aerial photos.

Alternative 1 – No Action

Under the No Action Alternative, no flood mitigation activities would be undertaken using FEMA funds. Hazardous wastes and materials that may be present in the project area would not be altered from their present condition.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Based upon the information reviewed, no impacts to hazardous materials or wastes are anticipated under Alternative 2.

Although subsurface hazardous materials are not anticipated to be present in the project area, excavation activities could expose or otherwise affect subsurface hazardous wastes or materials. Any hazardous materials discovered, generated, or used during implementation of the proposed project would be disposed of and handled by the City in accordance with applicable local, State, and Federal regulations.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

Based upon the information reviewed, no impacts to hazardous materials or wastes are anticipated under Alternative 3.

Any hazardous materials discovered, generated, or used during implementation of the proposed project would be disposed of and handled by the City in accordance with applicable local, State, and Federal regulations. This would include excavation of any contaminated soils, and identification of proper management and disposal alternatives.

3.4 SOCIOECONOMICS

3.4.1 Zoning and Land Use

Ozaukee County, Wisconsin was officially created in 1853. It is located along the eastern part of the State, bordering Lake Michigan. The size of the County is 232 square miles (OCEDC, 2005), containing eight cities and villages, and six townships. It is bordered by Sheboygan County to the north, Washington County to the west, and Milwaukee County to the south. After considerable growth in the years 1960 through 1980, the population of Ozaukee County has since increased steadily, to an estimated 82,317 people. This is an 11.5 percent increase over 1990 (OCEDC, 2005).

All elements except the storage element of the proposed project are located within the limits of the Village of Thiensville, in the far south central part of Ozaukee County. According to the 2000 Census, the population of the Village was 3,254, a 2.6 percent decline since 1980 (U.S. Census Bureau, 2000). The Wisconsin Department of Administration (WDOA) estimates that the population will continue to decline over the next 20 years, with a projected population of 2,885 by the year 2025 (WDOA, 2004). Thiensville is only one square mile in size, and is completely surrounded by the City of Mequon. The storage element is located in the City of Mequon, which has a population of 23,222 (WDOA, 2004). It has experienced steady population growth, most recently experiencing a 15.5 percent growth in population between 1990 and 2000 (U.S. Census Bureau, 2000). It is anticipated that this trend will continue, with projected population of 28,039 by the year 2025 (WDOA, 2004).

The adjacent land uses near the three reaches of channel widening are primarily commercial, and are zoned B-1 (Central Business District) or B-4 (Highway Business District). The culvert removal, channel and bridge installation directly affect a car dealership. Adjacent land use in vicinity of the Williamsburg Bridges is residential, primarily consisting of homes constructed in the 1960s. The Basin 2 area is located in three existing subdivision outlots and is currently zoned conservancy by the City of Mequon. Basins 3, 4, and 5 are currently zoned agricultural.

All elements except the storage area are also located in the Floodway District, as designated by the Village of Thiensville. The movement of floodwater, stream bank protection and maintenance of drainage way are all permitted uses in the Floodway District.

Alternative 1 – No Action

Under the No Action Alternative, there would be no land use and zoning changes. In a storm event, area residents would likely be affected by basement flooding and sanitary sewer backups. Repeated exposure to these events could have a negative impact on home and business values in the future.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Proposed improvements under Alternative 2 are consistent with current land use and zoning in the project area. The proposed water storage area is already zoned conservancy, and the character of the site would remain compatible with existing uses. Flood easements are being obtained from local property owners in vicinity of Basin 2, to preserve the area for future flood storage use. A copy of the draft easement is in Appendix D.

With the proposed improvements, businesses and residences in the downtown area would not be subject to extended periods of flooding, and plans for revitalizing downtown Thiensville could be realized.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

The improvements proposed to Pigeon Creek in the downtown area are consistent with current land use and zoning. With those improvements, businesses and residences in the downtown area would not be subject to extended periods of flooding. There would be slightly less impact to the car lot culvert area under this alternative, because the installed stream channel would be 60 feet wide as opposed to 70 feet wide under Alternative 2. Basin 2 is already zoned conservancy, and the character of the site would remain compatible with existing uses. Basins 3, 4, and 5 are primarily in agricultural/wetland use at this time, and are privately owned. Acquisition of these properties for storage would require purchase from private owners, and rezoning from agricultural to conservancy.

3.4.2 Visual Resources

Visual resources refer to the landscape character (what is seen), visual sensitivity (human preferences and values regarding what is seen), scenic integrity (degree of intactness and wholeness in landscape character), and landscape visibility (relative distance of seen areas) of a geographically defined viewshed.

The general character of the project area is downtown commercial, characterized by older buildings along Green Bay Road and more modern buildings along Main Street. A few private residences are intermingled among the commercial. The project site is relatively flat to gently sloping toward Pigeon Creek. In the downtown area, the creek lies primarily between Green Bay Road and Main Street, and can be viewed from the backs of homes and businesses. In the Williamsburg area, the creek can also be viewed from the backyards of private residences. The view of the water storage area would remain essentially the same to the surrounding subdivisions.

Alternative 1 – No Action

Under the No Action Alternative, no activities would be undertaken and visual resources would not be affected. In a storm event, Pigeon Creek would overflow and flood the surrounding area, compromising the visual character of the site.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Under Alternative 2, vegetation would be cleared along the banks of the creek, and bare earth would be visible from the rear of homes and businesses, as well as construction fencing and equipment. Post-construction, the disrupted soil would be re-seeded to match the existing turf or vegetation, with an emphasis on adding native vegetation. The larger, more mature trees would remain during construction, but some of the smaller trees may not be replaced. Overall, the visual impacts would be temporary and limited to periods of construction. In the long-term, the addition of native vegetation and improvements to the creek channel would enhance the visual character of the downtown area. The visual character of the Basin 2 site would remain unchanged.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

Heavy equipment would be seen in the downtown project area during construction, and staging areas would be visible from some homes as described under Alternative 2. However, these would be temporary impacts and, overall, visual resources would be enhanced by the addition of native vegetation and improvements to the creek channel. The visual character of the Basin 2 site would be altered slightly be the upland excavation required under this alternative. The visual character of the Basins 3, 4, and 5 areas would be enhanced by the proposed project.

3.4.3 Noise

Sound is most commonly measured in decibels (dB) on the A-weighted scale, which is the scale most similar to the range of sounds that the human ear can hear. The Day/Night Average Sound Level (DNL) is an average measure of sound. The DNL takes into account the volume of each sound incident, the number of times each incident occurs, and the time of day each incident occurs (nighttime sound is weighted more heavily because it is assumed to be more annoying to the community). The DNL descriptor is accepted by Federal agencies as a standard for estimating sound impacts and establishing guidelines for compatible land uses.

Noise, defined herein as unwanted or unwelcome sound, is regulated by the Federal Noise Control Act (NCA) of 1972. Although the NCA gives the EPA authority to prepare guidelines for acceptable ambient noise levels, it only requires those Federal agencies that operate noise-producing facilities or equipment to implement noise standards. EPA guidelines (and those of many Federal agencies) state that outdoor sound levels in excess of 55 dB DNL are “normally unacceptable” for noise-sensitive land uses such as residences, schools, and hospitals. Noise sensitive receivers in the vicinity of the project consist of residences.

Village ordinance dictates that construction can only occur between 7:00 AM and 7:00 PM Monday through Saturday.

Alternative 1 – No Action

Under the No Action Alternative, proposed activities would not occur and noise levels would be anticipated to remain at current levels.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Noise associated with Alternative 2 would be limited to construction noise emitted by mechanical equipment, including backhoes, front-end loaders, cranes and equipment trucks. Noise typically associated with this type of construction equipment can measure as much as 80 dB within 50 feet of the source, attenuating at a rate of 6 dB per doubling of distance away from the source.

Noise sensitive receivers in the project area include residences along Green Bay Road in the downtown Thiensville area, and residences in surrounding subdivisions in the Basin 2 area. The closest residence along Green Bay Road is approximately 1,400 feet away from the proposed project, and is buffered by a backyard and vegetation along the creek bank. Most residences in the Basin 2 area would be approximately 600 feet away from the areas where roadway elevation is proposed. Construction activities may minimally disturb these receivers. However, noise would not be continuous, and would be restricted to daylight hours. Therefore, the disturbance would be temporary and would not be concentrated in one area for the entire 7-month construction period, and therefore all of the sensitive noise receivers would not be affected at the same time.

Area residents may also experience daily noise from trucks hauling to and from staging areas and the project site. However, this impact would be temporary and would be spaced out over the daily hours of construction.

To mitigate for any potential noise impacts, the Village would inform residents of the time and duration of project activities. All activities would conform to the set hours of 7:00 AM to 7:00 PM as dictated by Village of Thiensville and City of Mequon ordinances. Construction equipment would be kept in good repair to ensure that proper noise muffling is maintained. Appropriate protective gear would be required to ensure the hearing protection of project workers.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

Noise associated with Alternative 3 would be limited to construction noise emitted by construction equipment as described above under Alternative 2.

Noise sensitive receivers in the project area are the same as those described above under Alternative 2. Mitigation for any noise impacts would occur as discussed under Alternative 2.

3.4.4 Public Services and Utilities

There are electric, telephone, cable television and storm sewer utilities in the downtown Thiensville area. There are no utilities within the project area in the Williamsburg neighborhood or in vicinity of the car lot culverts. There are gas, telephone, electric and cable television utilities in vicinity of Basin 2.

There are also sanitary sewer lines in the downtown project area. In the past, sanitary sewer backup has also occurred in conjunction with flooding of Pigeon Creek. Flooded basements contribute to sanitary sewer problems by causing inflow and infiltration of stormwater into the sanitary system.

Alternative 1 – No Action

Under the No Action Alternative, periodic flooding would still occur, potentially affecting residential and commercial utilities and access to Main Street. Nearby residents and business owners would still experience flooding and septic system backup.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Under Alternative 2, conveyance improvements would be made to Pigeon Creek that would reduce the amount of flooding in downtown Thiensville. This would help to decrease the overburden on existing drainage systems and the subsequent infiltration of the sanitary sewer, which currently results in flooding and septic system backup during significant storm events. Creek channel widening would require rewiring of aboveground electric, telephone and cable television utilities. Some end treatments for storm sewer outfalls would also be required. The duration and impact of service interruption would be minimal, and customers would not be out of service for more than half a day. Notice of service interruption would be provided to any affected residents or business owners, and every attempt would be made to minimize interruptions during business hours. No service interruption is anticipated for the Basin 2 area.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

Alternative 3 would provide the same benefits to the storm sewer system and sanitary sewer as described under Alternative 2. No other utilities would be affected by this alternative.

3.4.5 Traffic and Circulation

The proposed project involves conveyance improvements to Pigeon Creek, which would not cause closure of traffic routes, with the exception of the Williamsburg Bridge upgrades, which would require closure of each bridge during project construction.

Proposed water storage at Basin 2 would involve elevating Wauwatosa Road, causing interruption to traffic during construction. Likewise, under Alternative 3, proposed elevation of Bonniwell Road near Basin 3 would also cause traffic interruption during construction.

Alternative 1 – No Action

Under the No Action Alternative, no conveyance or storage improvements would be made, and no impacts to adjacent roadways would occur. Severe flooding would continue within the Village of Thiensville, compromising access to Main Street.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

Under Alternative 2, each of the two bridges on Williamsburg Road would be closed for two months during bridge replacement. Construction would occur so that one bridge would remain open while the other is being reconstructed. Williamsburg Road is looped, so traffic could be diverted one way or the other and still maintain continuous access to homes in the area. Improvement of the bridges would prevent the currently undersized bridges from overtopping during flood events, which would maintain continuous access for area residents and emergency vehicles. No roadway closure is proposed for the downtown Thiensville area. There would be a

slight increase in truck traffic in the downtown Thiensville area due to haul of excavated materials. However, the project is projected to occur over several months and would not result in an intense period of high traffic.

Traffic would be temporarily detoured for approximately three weeks onto adjacent roads during construction at Basin 2, where roadway elevation is proposed on Wauwatosa Road. Elevation of these roadways would work in concert with the proposed outlet improvements to prevent overtopping during flood events. This would maintain continuous access for area residents and emergency vehicles.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

Under Alternative 3, closure of the Williamsburg Road bridges would occur as described under Alternative 2. No roadway closure is proposed for the downtown Thiensville area. The project is projected to occur over several months and would not result in an intense period of high truck traffic.

Traffic would be temporarily detoured for approximately three weeks onto adjacent roads during construction at Basin 2, where roadway elevation is proposed on Wauwatosa Road and Bonniwell Road. Likewise, traffic would be detoured for approximately three weeks during construction at Basin 3, where Bonniwell Road is proposed for elevation. Elevation of these roadways would work in concert with the proposed outlet improvements to prevent overtopping during flood events. This would maintain continuous access for area residents and emergency vehicles.

3.4.6 Environmental Justice (EO 12898)

EO 12898 requires Federal agencies to make environmental justice part of their mission. Agencies are required to identify and correct programs, policies, and activities that have disproportionately high and adverse human health or environmental effects on minority and low-income populations. EO 12898 also tasks Federal agencies with ensuring that public notifications regarding environmental issues are concise, understandable, and readily accessible. Socioeconomic and demographic data were studied to determine if a disproportionate number (greater than 50 percent) of minority or low-income people have the potential to be adversely affected by the alternatives.

Table 2 summarizes the demographic information for Ozaukee County, Village of Thiensville and City of Mequon, in comparison to averages for the State of Wisconsin.

Table 1. Demographic Information

	Village of Thiensville	City of Mequon	Ozaukee County	State of Wisconsin
Total Population	3,254	21,823	82,317	5,363,675
White	96.6%	94.2%	96.7%	88.9%
African American	0.7%	2.3%	0.9%	5.7%
American Indian/Alaska Native	0.1%	0.1%	0.2%	0.9%

	Village of Thiensville	City of Mequon	Ozaukee County	State of Wisconsin
Asian	1.3%	2.4%	1.1%	1.7%
Of Hispanic or Latino Origin	1.0%	1.2%	1.3%	3.6%
Other Race	0.2%	0.2%	0.3%	1.6%
Total Minority	3.4%	6.2%	3.8%	13.5%
Median Household Income	$55,962	$90,733	$62,745	$43,791
Families Below Poverty Level	1.9%	1.3%	1.7%	5.6%
Individuals Below Poverty Level	2.7%	1.7%	2.6%	8.7%

Source: U.S. Census Bureau, 2000
OCEDC, 2005

Based on review of the above information, a disproportionate effect on minority or low-income populations would not occur with any of the alternatives. Thiensville is consistent with Ozaukee County and well below State averages for minorities and persons below poverty level. Mequon is also well below State and County averages for minorities and persons below poverty level, however it does have a higher concentration of Asian residents than the State, and a higher overall minority population than the County. Alternatives 2 and 3 would reduce potential future flooding and backup of the sanitary sewer system within the Village of Thiensville, and would benefit all people residing and doing business within the project area, which includes City of Mequon residents. Therefore, the project is in compliance with EO 12898.

3.4.7 Safety and Security

Safety and security issues considered in this analysis include the health and safety issues of the area residents and the public at-large, and the protection of personnel involved in activities related to the implementation of the Proposed Action.

EO 13045, Protection of Children, requires Federal agencies to make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children.

Alternative 1 – No Action

Under the No Action Alternative, the potential for future flooding of basements and backup of sanitary storm sewers would remain. Residents and business owners would also be susceptible to injury or negative health impacts due to unsanitary conditions following flooding, including the significant and widespread health and safety risk to residents who experience raw sewage backup into their homes and businesses. In addition, roadway closures due to flooding on Main Street and Williamsburg Road would continue to compromise the access of emergency vehicles to these areas during flood events.

Since the No Action Alternative does not involve the employment of personnel to perform the project activities, there would be no potential risks to the personal safety of project workers.

Alternative 2 – Conveyance Improvements and Storage at Basin 2 (Proposed Action)

Under Alternative 2, creek channel improvement activities could present safety risks to individuals performing the activities. To minimize risks to safety and human health, all project activities would be performed using qualified personnel trained in the proper use of the appropriate equipment, including safety precautions. In addition, all activities would be conducted in accordance with Occupational Safety and Health Administration (OSHA) regulations.

Implementation of Alternative 2 would increase the conveyance capabilities of Pigeon Creek, and would increase the storage capacity of the area at the intersection of Bonniwell Road and Wauwatosa Road. This would reduce the risk of injury and negative health impacts to residents as a result of flooding and storm sewer backup, and would also ensure that emergency vehicles could maintain access to Main Street and Williamsburg Road without compromising response times.

Persons of all ages reside in the project area neighborhood. Children would not be disproportionately affected by the proposed project; therefore the project is in compliance with EO 13045.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

Under the Alternative 3, storage improvement activities could present safety risks to individuals performing the activities. Actions to minimize risks to safety and human health would be completed as described under Alternative 2, as both alternatives would require similar construction activities.

Implementation of Alternative 3 would increase the flood storage capacity of the Thiensville/Mequon area. This would reduce the risk of injury and negative health impacts to residents as a result of flooding and storm sewer backup, and would also ensure that emergency vehicles could maintain access without compromising response times.

Persons of all ages reside in the project area neighborhood. Children would not be disproportionately affected by the proposed project; therefore the project is in compliance with EO 13045.

3.5 CULTURAL RESOURCES

In addition to review under NEPA, consideration of impacts to cultural resources is mandated under Section 106 of the National Historic Preservation Act, as amended, and implemented by 36 CFR Part 800. Requirements include identification of significant historic properties that may be affected by the proposed project. Historic properties are defined as archaeological sites, standing structures, or other historic resources listed in or eligible for listing in the National Register of Historic Places (NRHP) (36 CFR 60.4).

As defined in 36 CFR Part 800.16(d), the Area of Potential Effect (APE) “is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist.”

In addition to identifying historic properties that may exist in the APE of the Proposed Action, FEMA must also determine, in consultation with the appropriate State Historic Preservation Office (SHPO), what effect, if any, the action would have on historic properties. Moreover, if the project would have an adverse impact on these properties, FEMA must consult with the SHPO on ways to avoid, minimize, or mitigate the adverse effect. In Wisconsin, the acting SHPO is the Wisconsin Historical Society (WHS).

In 2002, the Village of Thiensville received an historic preservation grant-in-aid from the National Park Service, administered through WHS, to survey the architectural and historical resources within the corporate limits of the Village. The objective of this study was to identify those resources that are potentially eligible for listing in the NRHP. All properties within the Village were inspected, and 161 select properties were inventoried and photographed. Of these 161 properties, two historic districts and fifteen individual properties were thought to offer a sufficient degree of historical intrigue and/or architectural integrity to suggest potential for listing on the NRHP. Two of the individual properties are located within one of the historic districts (Heritage Research Ltd., July 2003).

The findings and recommendations of this study were compiled in a report prepared for the Village of Thiensville Historic Preservation Commission. The WHS also now includes these properties in its Architecture and History Inventory (AHI). Based on these recommendations, the two historic districts were determined eligible and became part of the NRHP in December 2004.

Wisconsin Emergency Management (WEM) initiated consultation with WHS in April 2005, with follow-up in June 2005. Meetings were also held to discuss the project with WHS on April 19, 2005 and June 21, 2005. In correspondence dated August 22, 2005, the SHPO agreed that historic properties are located within the project APE; however, the proposed undertaking will have no adverse effect on properties located within the project APE (see Appendix B).

Alternative 1 – No Action

Under the No Action Alternative, there would be no effects to cultural resources because proposed improvements would not occur.

Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)

The Green Bay Road Historic District consists of 11 resources and extends from 149 to 193-195 Green Bay Road. The Historic District occupies the west side of the street (see Figure 3) and includes eight residences and three commercial buildings. The Main Street Historic District consists of 10 structures located south of the Buntrock Avenue/Main Street intersection (see Figure 3). The structures consist of five commercial buildings, one municipal building, three residences and an outbuilding. Five of the structures are associated with the locally prominent Bublitz family. There are no historic structures identified in any other areas of the project.

Two of the properties within the Main Street Historic District have lots that end at the west bank of Pigeon Creek within the area identified as Reach 1 of Pigeon Creek, between the Milwaukee River and Green Bay Road. Likewise, seven properties within the Green Bay Road Historic District also have lots that end at the east bank of Pigeon Creek, within the area identified as Reach 2. According to the Chairman of the Thiensville Historic Preservation Commission, this area between Main Street and Green Bay Road receives the bulk of the flood damage. Properties

within the districts experience water coming up around the buildings, causing basement and first floor flooding (Heinritz, personal communication, July 12, 2005).

Improvements to the creek are proposed at this location, but direct impact to the properties is not anticipated. Creek channel improvements would not require acquisition of any parts of the property. Construction activities would be visible from the back of the structures, but this would be limited to the duration of project construction. Overall, the proposed project would benefit these historic structures by reducing flood levels and preventing flooding of basements and first floors.

Based on research in the Archaeological Survey Index (ASI) as provided by the State of Wisconsin, and review of previous SHPO consultations for nearby projects (Study 02-0571), there are no known archaeological sites located within the boundaries of the proposed project within the downtown Thiensville area. There is one archaeological site identified in the ASI, which is located approximately 110 feet west of Wauwatosa Road in vicinity of the proposed Basin 2 area. This site is approximately 340 feet north of any fill that would be placed at the site for the proposed elevation of Wauwatosa Road and is also outside of the wetland boundary. This site is not anticipated to be impacted by proposed roadway and outlet improvements; however, the site will be identified and fenced to ensure that no equipment storage or other disturbances occur in the area.

Based on results of the database search and further research, it is not anticipated that any NRHP-eligible or listed properties would be impacted by the proposed project; however, if artifacts or human remains are encountered during construction, work in the vicinity will be halted, and FEMA, the Office of the State Archaeologist (OSA), and the SHPO would be immediately contacted.

Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5

As under Alternative 2, it is not anticipated that any NRHP-eligible or listed properties would be impacted by Alternative 3; however, if artifacts or human remains are encountered during construction, work in the vicinity would be halted, and FEMA, the OSA, and the SHPO would be immediately contacted.

3.5.1 Tribal Coordination

Letters were sent in June 2005 to all federally-recognized tribes in the state of Wisconsin, and follow-up letters were sent July 6, 2005 (see Appendix B). To date, no comments have been received from the American Indian community. Consultation with the SHPO has been addressed as discussed above. The American Indian community will continue to be notified of project progress and will be informed of EA availability.

Table 2. Impact Summary Matrix

Description of Alternative	**Alternative 1 – No Action**	**Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)**	**Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5**
	• FEMA funds would not be used for improvements	• Channel widening along three reaches of Pigeon Creek in downtown Thiensville, totaling 14,500 CY of excavation • Widening and riprap reconfiguration beneath Main Street Bridge • Removal of "car lot" culverts and replacement with 60-foot open stream channel • Replacement of two bridges along Williamsburg Drive • 58 acre-feet of storage in Basin 2 area through control of existing outlet • Elevation of 1,000 feet of Wauwatosa Road, varying from 3 inches to 11 inches	• Channel widening along three reaches of Pigeon Creek in downtown Thiensville, totaling 14,500 CY of excavation • Removal of "car lot" culverts and replacement with 60-foot open stream channel • Replacement of two bridges along Williamsburg Drive • 315 acre-feet of storage in Basins 2, 3, 4, and 5 through control of existing outlets and 36,250 CY of excavation • Elevation of 2,000 feet of Wauwatosa Road and 400 feet of Bonniwell Road by one foot in Basin 2 area • Elevation of 500 feet of Bonniwell Road by one foot in Basin 3 area
Potential Impacts	**No Action (Alternative 1)**	**Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)**	**Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5**
Geology, Seismicity, and Soils	• No impacts	• Temporary soil disturbance; surface erosion may occur during construction • Geologic framework of area would not be affected • Over 20,000 cubic yards of material excavated to go to a licensed landfill or a contractor site approved by the Wisconsin DNR.	• Temporary soil disturbance; surface erosion may occur during construction • Geologic framework of area would not be affected • Over 270,000 cubic yards of material excavated to go to a licensed landfill or a contractor site approved by the Wisconsin DNR.

Potential Impacts	No Action (Alternative 1)	Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)	Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5
Water Resources and Water Quality	• No immediate impacts • Flooding and sanitary sewer backups would still occur	• Potential for minor impact on water quality as a result of construction grading • Not a Wild and Scenic River • No dewatering required during construction	• Potential for minor impact on water quality as a result of construction grading • Not a Wild and Scenic River • No dewatering required during construction
Floodplain Management	• EO 11988 is not applicable to this alternative	• Conveyance improvements would occupy the floodplain • Floodplain area reduced by approximately 20 acres • Eight repetitive loss structures removed from floodplain • Basin 2 not in floodplain • Flood easement required for Basin 2 area	• Conveyance improvements would occupy the floodplain • Floodplain area reduced by approximately 20 acres • Eight repetitive loss structures removed from floodplain • Basins 2, 3, 4, and 5 not in floodplain • Flood easements required for all basins
Air Quality	• No impacts	• Temporary emissions from heavy construction equipment	• Temporary emissions from heavy construction equipment
Terrestrial and Aquatic Environment	• No immediate impact	• Temporary disturbances due to noise • Removal of stream bank vegetation along approximately 2,250 linear feet during construction • Enhanced spawning habitat for fish • Large trees avoided a feasible • Impacted vegetation would be replaced with native species	• Temporary disturbances due to noise • Removal of stream bank vegetation along approximately 2,250 linear feet during construction • Enhanced spawning habitat for fish • Large trees avoided as feasible • Impacted vegetation would be replaced with native species

Potential Impacts	No Action (Alternative 1)	Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)	Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5
Wetlands	• No changes to the existing wetlands would occur	• Fringe wetlands along Pigeon Creek would be expanded and allowed to revegetate; temporary impact during project construction controlled through use of BMPs • Temporary impact at Wetland 1 controlled by replanting and monitoring native vegetation • No direct impact to wetland in Basin 2 area • Potential erosion and sedimentation of wetlands in Pigeon Creek and Basin 2 areas to be controlled through use of BMPs and re-vegetation	• Fringe wetlands along Pigeon Creek would be expanded and allowed to revegetate; temporary impact during project construction controlled through use of BMPs • Temporary impact at Wetland 1 controlled by replanting and monitoring native vegetation • Temporary wetland impact at Basin 2, due to elevation of Wauwatosa and Bonniwell Roads; would be controlled through use of BMPs and re-vegetation • Excavation of wetlands in Ponds 4 and 5
Threatened and Endangered Species	• No impact	• 2 fish species, 6 plant species and 1 snake known to occur in vicinity of proposed conveyance improvements • 5 plant species, 1 snake species and 1 natural community known to occur in vicinity of Basin 2 • No anticipated impacts to known species	• 5 plant species, 1 snake species and 1 natural community known to occur in vicinity of Basin 2 • No anticipated impacts to known species
Hazardous Materials and Wastes	• No impact	• Leaking Underground Storage Tanks (LUSTs) in vicinity of the project area do not pose a threat to the proposed project site	• Leaking Underground Storage Tanks (LUSTs) in vicinity of the project area do not pose a threat to the proposed project site

Potential Impacts	No Action (Alternative 1)	Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)	Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5
Zoning and Land Use	• No impact • Continued flooding compromises property values in the area	• Project is compatible with existing and future land use in the downtown Thiensville area • Basin 2 area is already zoned conservancy, and use would not change from existing • Flood easements in progress for Basin 2 area	• Project is compatible with existing and future land use in the downtown Thiensville area • Basin 2 area is already zoned conservancy, and use would not change from existing • Significant land acquisition and rezoning would be required to install Basins 3, 4, and 5
Visual Resources	• No impact	• Minimal temporary impacts due to construction equipment and soil disturbance during construction • Temporary reduction in vegetation until new plantings become mature	• Minimal temporary impacts due to construction equipment and soil disturbance during construction • Temporary reduction in vegetation until new plantings become mature
Noise	• No impact	• Temporary noise impacts only • Closest residence 1,400 feet away and screened by trees	• Temporary noise impacts only • Closest residence 1,400 feet away and screened by trees
Public Services and Utilities	• No impact	• Conveyance improvements require rewiring of aboveground electric, telephone and cable; some end treatments for storm sewer outfalls would also be required • Duration of service interruption less than half a day • No service interruptions at Basin 2	• Conveyance improvements require rewiring of aboveground electric, telephone and cable; some end treatments for storm sewer outfalls would also be required • Duration of service interruption less than half a day • No service interruptions at Basins 2-5

Potential Impacts	No Action (Alternative 1)	Alternative 2 – Conveyance Improvements and Storage in Basin 2 (Proposed Action)	Alternative 3 – Conveyance Improvements and Storage in Basins 2, 3, 4, and 5
Traffic and Circulation	• Surrounding roadways would continue to overtop with water during storm events	• Closure of portions of Williamsburg Road during construction: three months for each bridge • Continuous access provided via other end of Williamsburg Road (loop road) • Traffic detours for three weeks in Basin 2 area • Proposed project alleviates overtopping of roads during flooding	• Closure of portions of Williamsburg Road during construction: three months for each bridge • Continuous access provided via other end Williamsburg Road (loop road) • Traffic detours for three weeks in vicinity of Basins 2 and 3 • Proposed project alleviates overtopping of roads during flooding
Environmental Justice	• No impact	• No impact	• No impact
Safety and Security	• Future flooding could result in compromised access on surrounding roadways • No potential risks to the personal safety of project workers	• Safety risks created to individuals performing project activities • Project would prevent water from overtopping roads and provide safer driving conditions (including emergency vehicles) during storm events • Decreased risk of sanitary sewer backup; less health risks to area residents	• Safety risks created to individuals performing project activities • Project would prevent water from overtopping roads and provide safer driving conditions (including emergency vehicles) during storm events • Decreased risk of sanitary sewer backup; less health risks to area residents
Cultural Resources	• No impact	• No anticipated impact to archaeological sites • Main Street Historic District and Green Bay Road Historic District listed on the NRHP – no impact anticipated • Project would have positive impact on historic structures by controlling flooding and preventing damages • Tribal consultation has taken place	• No anticipated impact to archaeological sites • Main Street Historic District and Green Bay Road Historic District listed on the NRHP – no impact anticipated • Project would have positive impact on historic structures by controlling flooding and preventing damages • Tribal consultation has taken place

Cumulative impacts are those effects on the environment that result from the incremental effect of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time.

Cumulatively, the proposed project would have positive impacts on the overall health of the Pigeon Creek watershed and Milwaukee South Watershed by increasing flood storage and decreasing backwater effects at the confluence of Pigeon Creek and the Milwaukee River. This would reduce stream bank erosion and provide a more consistent hydrologic environment for fish and plants. In addition, the proposed project would have a positive effect on quality of life in the Village of Thiensville, by reducing flooding in the downtown business and residential area. The Village of Thiensville and City of Mequon would be able to continue their partnership in completing components of the City of Mequon and Village of Thiensville Town Center Plan, designed to focus on the downtown Thiensville area as the "heart" of both communities. Improving flood conditions in the area makes it possible to realize this vision.

The Village of Thiensville has been actively involved in keeping the public informed about the proposed project through newspaper articles, meetings with affected residents, and letters to property owners adjacent to the project area.

The Village of Thiensville proposes to finance their portion of the project by amending Tax Incremental Financing (TIF) District #1. A public hearing to discuss the proposed amendment and the proposed project plan was held on July 25, 2005. A public hearing notice was mailed to all property owners within the existing TIF District #1, which includes the downtown Thiensville project area. A copy of this notice is included on the following page. The meeting was also open to the general public.

Specific public participation activities included:

- May 19, 2005 – project article in the *News Graphic*, a newspaper covering all of Ozaukee County (including Thiensville and Mequon)
- May 25, 2005 – letters to adjacent property owners describing the project and requesting access to their property for wetland review
- July 9, 2005 – public meeting notice sent to property owners in the project area
- July 25, 2005 – public meeting held at Thiensville Village Hall
- August 4, 2005 – project article in *The Courant*, a newspaper covering the Village of Thiensville and City of Mequon
- August 15, 2005 – meeting with the developer and homeowners association representatives for the Hawks Landing and Hawks Bluff Subdivisions to discuss project developments in the Basin 2 area

The status of the project has also been discussed at numerous Village Board meetings to date. All Village Board meetings are open to the public and are also locally televised. Minutes from all meetings are also available to the public.

A public notice advertising the availability of the draft EA for public review was provided to a local newspaper of general distribution in the project area (see Appendix E). The document was also available for review on line at the FEMA website: http://www.fema.gov/ehp/docs.shtm. The public was provided 30 days (March 23 through April 21) for comment on the Proposed Action. A public open house was also held at Thiensville Village Hall on March 27th.

FEMA received a number of comments in response to the public notification of the Environmental Assessment (see Appendix E). Some of these comments caused a re-examination of certain environmental aspects, particularly hydrology. There were several comments pertaining to the relationship of Pigeon Creek and the Milwaukee River, and claims that the project as proposed will not alleviate flooding. Upon re-examination, it was found that there would be enough of a reduction at the mouth of the creek to indicate that levels of flooding in Pigeon Creek would be reduced. There may still be overland flooding from the Milwaukee River, but the project is anticipated to serve its intended purpose of reducing flood levels in Pigeon Creek, and therefore reducing the floodplain of Pigeon Creek as indicated.

While comments were thoughtful, a majority of the comments did not address environmental issues, and therefore will not prevent approval of the Environmental Assessment. A Finding of No Significant Impact has been signed and is based upon the conditions contained in the EA and the requirement that final project designs will be completed and permits obtained from the appropriate agencies. Easements will also be obtained from adjacent property owners. If the final design affects any of the approved project conditions, this EA must be updated to comply with any modifications that may lead to changes in project environmental conditions.

The following tables provide a summary of the anticipated mitigation and permitting/approval requirements for the proposed project alternatives.

Table 3. Mitigation by Alternative

Alternatives	Mitigation Requirements
Alternative 1 – No Action	• No mitigation measures are required.
Alternative 2 – Conveyance Improvements and Storage in Basin 2 **Alternative 3 – Conveyance Improvements and Storage In Basins 2, 3, 4, and 5**	• Erosion would be minimized through the use of BMPs, including protecting erodible surfaces (through mechanisms such as silt fences or hay bales) and not working during precipitation events. • Exposed soils would be seeded in accordance with recommendations and regulations. • Compacted soils would be loosened by disking or raking • Project would be in compliance with EO 79-19. • Vehicle engines would be kept in good repair and turned off while not in use to prevent air emissions. • Project access roads would be watered when conditions are dusty. • Any hazardous materials discovered, generated, or used during implementation of the proposed project would be disposed of and handled by the Village in accordance with applicable local, State, and Federal regulations. • Vegetation would be replanted with native species or species comparable to existing vegetation. • To mitigate for any potential noise impacts, the Village would inform residents of the time and duration of project activities to help mitigate noise impacts. • All activities would conform to the hours of construction set by the Village (7:00 AM through 7:00 PM Monday through Saturday). • Appropriate gear would be required to protect the hearing of project workers. • Appropriate signage would direct drivers to detours, and would inform them of work zones and equipment transport routes. • All project activities would be performed using qualified personnel trained in the proper use of the appropriate equipment, including safety precautions.

Alternatives	Mitigation Requirements
	• All activities would be conducted in accordance with OSHA regulations. • If artifacts or human remains are encountered during construction, work in the vicinity would be halted, and FEMA, the OSA, and the SHPO would be immediately contacted. • Flagging and fencing would be used to limit construction staging and parking areas.

Table 4. Permit/Approval Requirements by Alternative

Alternative	Permit/Approval Requirements
Alternative 1 – No Action	No permits are required.
Alternative 2 – Conveyance Improvements and Storage in Basin 2 **Alternative 3 – Conveyance Improvements and Storage In Basins 2, 3, 4, and 5**	• Section 30 permitting process will be undertaken to address Wisconsin waters affected by the project. • A Letter of Map Revision (LOMR) will be obtained for floodplain modifications. • A Floodplain Impact Notification will be submitted to the WDNR. • A USACE Section 404 Letter of Permission will be obtained for work in Pigeon Creek and associated wetlands. • A WPDES permit will be obtained for proposed project grading. • Village will pass an ordinance detailing monitoring and methods for debris and invasive vegetation removal in project area • A flood easement will be obtained from adjacent property owners in the Basin 2 area (see draft agreement in Appendix D)

7.1 CONSULTATIONS

7.1.1 Agency Coordination

SHPO

USACE, Waters Bureau

WDNR, Bureau of Environmental Resources (Rare, Threatened, and Endangered Species)

WDNR, Division of Waters

WDNR, Fisheries

WDNR, Watershed Coordinator

7.1.2 Distribution

The following will be sent notice of the Draft EA:

Federal Agencies

U.S. Army Corps of Engineers (USACE)

U.S. Department of the Interior, U.S. Fish and Wildlife Service

Tribes

Bad River Reservation

Forest County Potawatomi Community

Ho Chunk (Winnebago) Reservation

Lac Courte Oreilles Reservation

Lac Du Flambeau Reservation

Menomonee Reservation

Oneida Reservation

Red Cliff Reservation

Sokoagon Chippewa Community

St. Croix Reservation

Stockbridge-Munsee Community

State, County, and Local Agencies

Wisconsin Emergency Management

Wisconsin Department of Natural Resources (WDNR)

State Historic Preservation Office (SHPO)

Southeastern Wisconsin Regional Planning Commission

Village of Thiensville

City of Mequon

Ozaukee County

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Personal Communication

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Eberle, Joseph. Ruekert & Mielke, Village of Thiensville Engineer. Personal communication with Jessica Overmohle, URS Planner, ongoing throughout project process.

Gruber, Rebecca. USACE. Personal communication with Jessica Overmohle, URS Planner, February 22, 2006 (record of conversation attached).

Heinritz, Ron. Thiensville Historic Preservation Commission. Personal communication with Jessica Overmohle, URS Planner, July 12, 2005 (record of conversation attached)

Wawrzyn, Will. WDNR, Fisheries Biologist. Personal communication with Jessica Overmohle, URS Planner, December 12, 2005 (email correspondence attached).

TELEPHONE NOTES

Date: 7/12/2005 **Call was** ☒ **Placed** ☐ **Received**

Project: Pigeon Creek Flood Improvements EA

Conversation Between: Jessica Overmohle

And Ron Heinritz **of** Thiensville Historic Preservation Commission

NOTES:

Ron is the Chair of the Thiensville HPC. The purpose of the call was to inquire about homes in the Green Bay Road/Main Street area, and also to clarify the status of properties identified in the 2003 Heritage Research report.

The two historic districts referenced in the report were sent through for consideration, and were approved and designated as NRHP properties in December 2004. Property owners of the other properties identified as potentially eligible did not wish to put forth their properties for consideration.

A local ordinance also governs all buildings within the districts. Any change to the exterior of the buildings would have to be approved by the HPC and get a "certificate of appropriateness." Demolition permits are also required if building demolition is proposed.

Ron indicated the area bordering on Pigeon Creek along Green Bay Road gets the bulk of flood damage. On some of the buildings, water comes up around the buildings and causes flooding. He said flood control would be beneficial to these buildings. He also said that flooding has crossed Riverview Road between Main Street and Green Bay Road, and also South Main Street in the past. He explained some of the drainage patterns and talked about the development in the City of Mequon being a prime culprit of the flooding in downtown Thiensville.

I told Ron we would notify the HPC of further project updates, and inform them of availability of the EA.

TELEPHONE NOTES

Date: February 23, 2006 **Call was** ☐ **Placed** ☒ **Received**

Project: Pigeon Creek Flood Improvements EA

Conversation Between: Jessica Overmohle

And Rebecca Gruber **of** United States Army Corps of Engineers, Wisconsin

NOTES:

Rebecca called to follow up with comments on some wetland information for the proposed project that I had sent 12/16/05. She first clarified that the whole project must be covered under a single permit, and could not be broken into parts (i.e. Basin 2 area and Pigeon Creek area). One authorization is required for the entire project. If the two parts were constructed 3-5 years apart, they could be considered under separate permits, but not under any other circumstances.

Over 10,000 SF of impact requires a Letter of Permission. If impact totals over 2 acres, an Individual Permit would be required. Wisconsin doesn't issue the Federal 404 permit, but rather has its own permits. The review periods are essentially the same for the two different permits. Once the permit is received, USACE prepares an executive summary or synopsis of the project that is distributed for public review (30 days). The difference is in the way the permits are noticed – an Individual Permit requires more formal notice, while a Letter of Permission is just noticed on the USACE website.

Rebecca said that the impacts at Basin 2 appear to be negligible, if any. It is the Pigeon Creek portion of the project that drives the permitting process. She noted that the beneficial qualities of the entire project are apparent. The usual course of action is to submit permit applications after the EA process, when projects are in final design and more detailed drawings can be submitted.

Text of email from Will Wawrzyn, WDNR Fisheries Biologist, 12/12/2005

Pigeon Creek does support a diverse warmwater sport and forage fishery. I walked the project reach with Marty and most of the stream dating back to the late 80's. The project as proposed will provide a variety of benefits to fish, other aquatic life and wildlife;
1. Improve channel (bed and bank) stability by providing bank forming flows more frequent access to the floodplain at two locals (stream channel is not being widened but the overbank floodplain is),
2. Provide additional in-stream cover for fish and wildlife (e.g. snags),
3. Removal of aquatic life and wildlife barriers to migration specifically the enclosed reach at Green Bay Rd.

Pigeon Cr. is the largest and least impacted stream/watershed in the lower Milwaukee R. downstream of the Thiensville Dam and impoundment. The floodplain and wetland corridor along Pigeon Cr. once hydrologically re-connected as part of this project, will allow Lake Michigan potadromous and Milwaukee R. resident fish access to historical spawning grounds.

In anticipation of this project, we are working with an interested dam owner on Pigeon Cr. who is interested in removing another dam barrier on the creek. This later project would not be a high priority had the flood control project not included removal of other barriers.

If you need more information, please don't hesitate to call or e-mail.
Sincerely,
Will

Will Wawrzyn, Fisheries Biologist
Milwaukee River Basin Team
Wisconsin Department of Natural Resources

Beth Kunkel, Professional Wetland Scientist, URS-Minneapolis (MSP) – Peer Reviewer/Field Assessment/Floodplain Review. Conducted field research for Water Resources and Water Quality, Floodplain Management, Terrestrial and Aquatic Environment, Wetlands.

Jessica Overmohle, Environmental Planner, URS-MSP – Technical Researcher and Task Coordinator. Author of sections on Purpose and Need, Alternatives, Geology, Seismicity, and Soils, Air Quality, Hazardous Materials, Threatened and Endangered Species, Zoning and Land Use, Visual Resources, Noise, Public Services and Utilities, Traffic and Circulation, Environmental Justice, Safety and Security, Cumulative Impacts.

Amy Siegel, Document Control Supervisor, URS-Gaithersburg (GTB) – Document Quality Control.

Stephen Carruth, FEMA National Environmental Coordinator, URS-GTB – Independent Technical Reviewer.

Evelyn Tidlow, URS-MSP – Project Manager.

Figures

Appendix A
Project Area Photographs

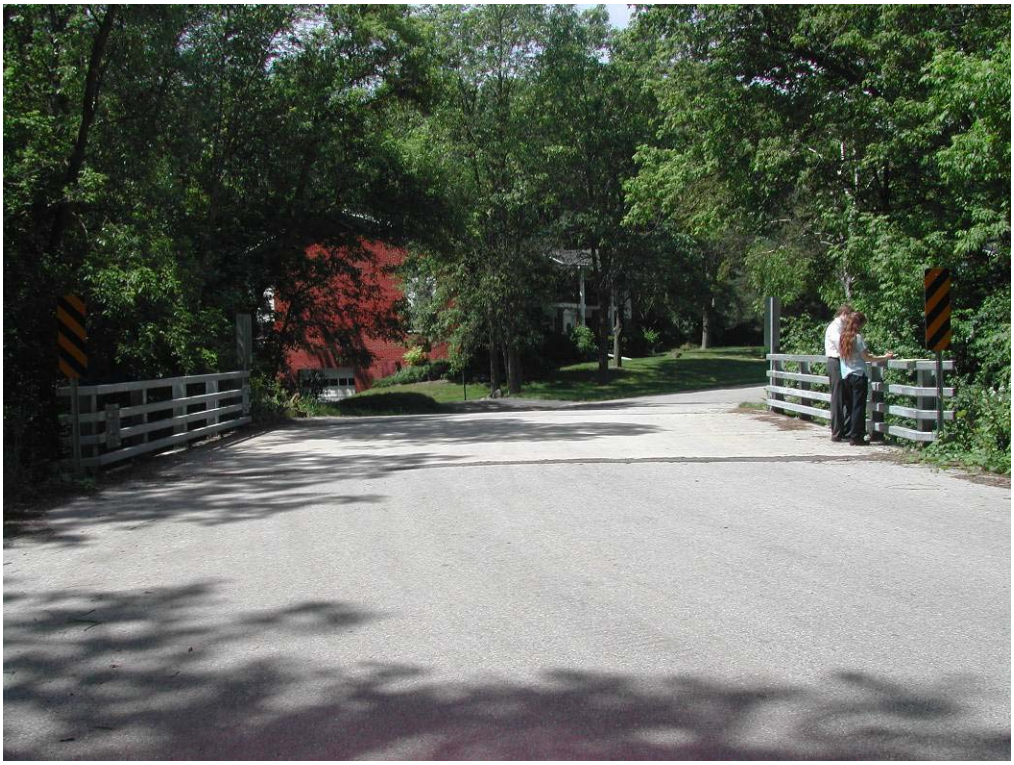
Flooding of Milwaukee River into Village Park facilities, facing east

Flooding behind homes/businesses, from the west side of Green Bay Road near Pigeon Creek

Car lot culvert outlet, west edge of Harley Davidson lot

Pedestrian bridge along bike path on the west side of Main Street

Pigeon Creek and adjacent residences, taken from Williamsburg Bridge #1



Williamsburg Bridge #2, from the east

View of Basin 2, east side of Wauwatosa Road looking north.

Basin 2 area, east side of Wauwatosa Road.

Appendix B
Tribal/Agency Correspondence

Tribal consultation letters were distributed to the following:

Bad River Reservation
Bad River Tribal Council
Elizabeth Drake, Chairperson
PO Box 39
Odanah, WI 54861

Forest County Potawatomi Community
Forest County Potawatomi Executive Council
Hartford Shegonee, Chairperson
PO Box 340
Crandon, WI 54520

Ho Chunk (Winnebago) Reservation
Wisconsin Ho Chunk Business Committee
Gordon Thunder, Chairperson
PO Box 667
Black River Falls, WI 54615

Lac Courte Oreilles Reservation
Lac Courte Orielles Tribal Governing Board
Gaiashkibos, Chairperson
Route 2, Box 2700
Hayward, WI 54843

Lac Du Flambeau Reservation
Lac Du Flambeau Tribal Council
Thomas Maulson, President
PO Box 67
Lac Du Flambeau, WI 54538

Menominee Reservation
Menominee Tribal Legislature
Glenn Miller, Chairperson
PO Box 910
Keshena, WI 54135

Oneida Reservation
Oneida Tribal Council
Deborah Doxtater, Chairperson
PO Box 365
Oneida, WI 54155

Mr. Raymond M. Perry, Chairperson
Red Cliff Band of Lake Superior Chippewa
88385 Pike Road, Hwy 13
Bayfield, WI 54814

Sokaogon Chippewa Community of Wisconsin
Mrs. Sandra Rachal
3051 Sand Lake Road
Crandon, WI 54520

St. Croix Reservation
St. Croix Council
Lewis Taylor, Chairperson
Po Box 287
Hertel, WI 54845

Stockbridge-Munsee Community
Stockbridge-Munsee Tribal Council
Laura Coyhis, Chairperson
8476 Moh He Con Nuck Rd.
Bowler, WI 54416

[date]

[tribal address]

RE: Consultation on FEMA Flood Mitigation project in Thiensville, Wisconsin
FEMA PDMC-PJ-05-WI-2003-001

The Federal Emergency Management Agency (FEMA) is planning to complete a flood mitigation project in the Village of Thiensville and City of Mequon. The proposed project is described on the attachment to this letter and locations are shown on the enclosed map.

As part of the FEMA environmental review process for these projects, your tribe was contacted regarding the possible effect of the proposed project on cultural properties of historic or traditional significance (Traditional Cultural Properties). No comments have been received to date. To ensure full coordination, FEMA once again invites any comments on the potential impacts of the projects on areas in proximity to the proposed projects traditionally used by, or sacred to, American Indians. We realize that information on Traditional Cultural Properties is very sensitive. If concerns regarding Traditional Cultural Properties are shared with FEMA, those concerns will be considered privileged and confidential information and will not be released to the public.

FEMA is consulting with the Wisconsin Historic Preservation Office (SHPO) regarding the need for cultural resource surveys to inventory archaeological and aboveground resources potentially affected by this project. Should survey be necessary, all work will follow SHPO-approved methods and will be subject to the Section 106 review process as required by the National Historic Preservation Act of 1966.

An environmental assessment (EA) is being prepared and will address issues in compliance with the Section 106 process. Specific information regarding availability of the EA will follow as details are finalized.

Thank you for your assistance. If you have any questions or comments, please contact me at (312) 408-5540 or Jeanne.Millin@dhs.gov

Sincerely,

Jeanne Millin
Regional Environmental Officer

Attachments:
Project information
Project vicinity map

CC: Vince Parisi, Federal Emergency Management Agency
Susan Boldt, Wisconsin Emergency Management

REQUEST FOR SHPO COMMENT AND CONSULTATION ON A FEDERAL UNDERTAKING

Submit one copy with each undertaking for which our comment is requested. Please print or type. Return to:

Wisconsin Historical Society, Division of Historic Preservation, Office of Preservation Planning, 816 State Street, Madison, WI 53706

I. GENERAL INFORMATION

MITIGATION
PRE-DISASTER

☐ **This is a new submittal.**
☒ **This is supplemental information relating to Case #:** 05-0540-02 **, and title:** VILLAGE OF THIENSVILLE
☐ **This project is being undertaking pursuant to the terms and conditions of a programmatic or other interagency agreement. The title of the agreement is** _____

Please Include the Following Information, as Applicable:

AGENCY
a. Federal Agency Overseeing Project (supplying funds, assistance, license, permit): FEDERAL EMERGENCY MANAGEMENT JEANNE MILLIN

b. Project Name: VILLAGE OF THIENSVILLE PDM PROJECT - PIGEON CREEK

c. Project Street Address: 100-200 GREEN BAY ROAD, 130 S. MAIN - 200 N. MAIN ST

d. County: OZAUKEE City: THIENSVILLE Zip Code: 53092-1602

e. Project Location: Township 09 N, Range 21 E/W (circle one), Section 21 22, Quarter Sections NE NW

f. Contact Person on Project: SUSAN BOLDT Phone: 608 242-3214

g. Return Address: 2400 WRIGHT ST. MADISON Zip: 53708-7865

h. Email Address: Susan.Boldt@dma.state.wi.us Jessica_Overmohle@URSCorp.Com

i. Project Narrative Description—Attach Information as Necessary.

j. Area of Potential Effect (APE). Attach Copy of U.S.G.S. 7.5 Minute Topographic Quadrangle Showing APE.

II. IDENTIFICATION OF HISTORIC PROPERTIES

☒ Historic Properties are located within the project APE per 36 CFR 800.4. Attach supporting materials.
☐ Historic Properties are not located within the project APE per 36 CFR 800.4. Attach supporting materials.

III. FINDINGS

☐ No historic properties will be affected (i.e., none is present or there are historic properties present but the project will have no effect upon them). Attach necessary documentation, as described at 36 CFR 800.11.
☒ The proposed undertaking will have no adverse effect on one or more historic properties located within the project APE under 36 CFR 800.5. Attach supporting documentation.
☐ The proposed undertaking will result in an adverse effect to one or more historic properties and the applicant, or other federally authorized representative, will consult with the SHPO and other consulting parties to resolve the adverse effect per 36 CFR 800.6. Attach supporting documentation and a proposed plan to resolve adverse effect(s).

Authorized Signature: Susan Stretch-Boldt Date: 08-03-05

Type or print name: SUSAN STRETCH-BOLDT

IV. STATE HISTORIC PRESERVATION OFFICE COMMENTS

☒ Agree with the finding in section III above.
☐ Object to the finding for reasons indicated in attached letter.
☐ Cannot review until information is sent as follows: _____

Authorized Signature: _____ Date: 8-22-05

U.S. Department of Homeland Security
Region V
536 South Clark Street, Floor 6
Chicago, IL 60605

FEMA

January 4, 2006

Janet M. Smith
U.S. Fish and Wildlife Service
Green Bay Ecological Services Office
2661 Scott Tower Drive
New Franken, WI 54229

RE: Section 7 Consultation for Pigeon Creek Flood Mitigation Project, Village of Thiensville, Ozaukee, WI
Dear Janet,

FEMA has reviewed your letter dated July 27, 2005 regarding the above-referenced project. After careful consideration of your letter and evaluation of the environmental impacts of project alternatives, FEMA has determined that the proposed project would have *no adverse effect* on federally-listed threatened or endangered species or designated critical habitat as defined in Section 7 of the Endangered Species Act of 1973, as amended. Coordination on state-listed species has taken place with the Wisconsin Department of Natural Resources.

Sincerely,

Jeanne Millin
Regional Environmental Officer
DHS/FEMA Region V

Enclosures: Copy of previous correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Green Bay ES Field Office
2661 Scott Tower Drive
New Franken, Wisconsin 54229-9565
Telephone 920/866-1717
FAX 920/866-1710

July 27, 2005

Ms. Jessica Overmohle
URS Corporation
700 South Third Street, Suite 700
Minneapolis, Minnesota 55415

re: Pigeon Creek Flood Mitigation Project
Village of Thiensville
Ozaukee County, Wisconsin

Dear Ms. Overmohle:

The U.S. Fish and Wildlife Service (Service) has received your letter dated July 1, 2005, requesting comments on the subject project. The project entails the improvement of conveyance capacity for Pigeon Creek in downtown Thiensville, as well as an increase in upstream storage capacity, to reduce the severity of flooding in downtown Thiensville. Due to staff time constraints and priority work activities, we are able to review your project primarily for potential impacts to federally-listed threatened and endangered species and candidate species. Be advised that other environmental concerns may be associated with this project such as wetland and stream impacts, erosion control needs, and effects on state-listed threatened or endangered species. If stream or wetland impacts will occur, state or federal permits may be needed. If resource impacts are expected to occur, we recommend that you forward this project to the appropriate Wisconsin Department of Natural Resources Office for their review.

Please provide us copies of any future documents that may be associated with this project or of future projects you may be planning that would require Service review. This will allow us to keep our files current. We will provide comments as time and work priorities allow.

Federally-Listed Species, Candidate Species, and Critical Habitat

According to our files, the following federally-listed threatened or endangered species, candidate species, or critical habitats occur in Ozaukee County:

Classification	Common Name	Scientific Name	Habitat
endangered	Hine's emerald dragonfly	Stomatochlora hineana	calcareous streams & associated wetlands overlying dolomite bedrock

threatened	eastern prairie fringed orchid	Platanthera leucophaea	wet grasslands

Currently, our records indicate that there are no federally-listed threatened or endangered species or critical habitat present at the project site. However, there may be state-listed species and sensitive natural communities in or near the project area. In addition, over time, habitats at or near the project site may be utilized by listed or proposed species not present at this time. Further, fish, wildlife or plant species occurring within the project area may become federally-listed as threatened or endangered or proposed for listing; it is also possible that critical habitat could be proposed or designated for a species. Therefore, if there is a time lag between plan completion and execution, it is important to reassess the impact of the project on federally-listed or proposed species or designated critical habitat prior to completion of the final project design and start of construction. In such instances, this office should be contacted for updated species and critical habitat information. Our species/critical habitat list is updated every 6 months.

If this project involves a Federal action (i.e., funding) and/or activity (i.e., permits), the lead Federal agency (e.g., Federal Emergency Management Agency), or its designated agent, is responsible for contacting the Service regarding that agency's determination as to whether the selected project alternative may affect federally-listed threatened or endangered species or adversely modify designated critical habitat. Section 7 of the Endangered Species Act of 1973, as amended (ESA), directs Federal agencies to consult with the Service on such matters. The Service would respond as to whether we concur with the determination of the Federal agency or its designated agent. If the proposed project may adversely affect federally-listed threatened or endangered species or adversely modify designated critical habitat, the Federal action agency should initiate formal consultation with the Service in accordance with section 7 of the ESA. Information on the section 7 consultation process can be obtained by contacting the staff person identified at the end of this letter.

We appreciate the opportunity to respond. Questions pertaining to these comments can be directed to Mr. Joel Trick at 920-866-1737.

Sincerely,

Catherine J. Corner

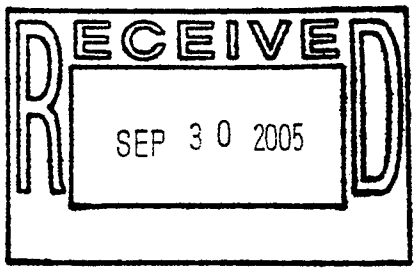
for Janet M. Smith
Field Supervisor

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
Gloria L. McCutcheon, Regional Director

Waukesha Service Center
141 NW Barstow, Room 180
Waukesha, Wisconsin 53188
Telephone 262-574-2100
FAX 262-574-2117

September 21, 2005



Ms. Diane Roberston, Village Administrator
Village of Thiensville
250 Elm Street
Thiensville, WI 53092

Subject: Pigeon Creek Flood Control Project

Dear Ms. Robertson:

This letter follows the August 23, 2005 meeting. During that meeting, Village representatives requested that the Department clarify, in writing, the Department's view of the proposed flood control project in the downtown Thiensville area. You had also asked us to document the Department's legal authority on enclosures as well as to discuss authority on future repair and maintenance of the current enclosure.

Will Wawrzyn, DNR Fisheries Biologist, is familiar with this area and has walked the site with Marty Rye. Conceptually, we do not have any biological issues with the proposed floodplain modifications and look forward to working with your consultants to provide some improved habitat areas in the new channel. We also strongly support the removal of the current enclosure and do not have a concern with the proposed bridges to provide access to the retail store.

Chapter 30 and NR 216 permits will be needed for the construction. We will have to review the project specifications for erosion control standards, engineering, habitat improvement, etc. but we are confident that we can resolve any environmental concerns through minor project modifications.

In regard to the enclosure, the State of Wisconsin has a rich history of protecting public interests in navigable waterways. With the enactment of s. 30.02 (1)(b), Wis. Stats., (the predecessor of s. 30.12, Wis. Stats.) in 1933, it became, "... unlawful to deposit any material or to place any structures upon the bed of any navigable water where no shore line has been established or beyond such shore line where the same has been established." The adoption of this section prohibited any structure in navigable waters.

In 1949 there was an amendment to s. 30.02, Wis. Stats., which continued the general prohibition of structures or deposits in navigable waters but established a mechanism for approving them as long as they did not materially block navigation. In 1951, s. 30.02, Wis. Stats., was modified again, to include standards that the structure or deposit may not obstruct navigation but also that they may not, "...reduce the effective flood flow capacity of the stream or is not detrimental to the public interest."

It appears that the enclosure of Pigeon Creek in the Village occurred sometime in the early 1960's. At the time of construction, the State of Wisconsin had permit authority over the construction of such a structure. The Department's records do not indicate that a permit was ever issued. Based upon the statutory criteria at the time of construction (not materially obstruct navigation, reduce the effective flood flow capacity, not be detrimental to public interest), it is unlikely that permits or approvals would have been granted.

At this time, the Department considers the enclosure to be an unpermitted structure. Under Section 30.294, Wis. Stats., every violation of Chapter 30 is declared a public nuisance and may be abated by action brought by any person, including the State of Wisconsin. Any work done to the enclosure requires Department authorization. The Department considers the enclosure to be a detriment to public interest, an obstruction to navigation and effectively reduces flood flow capacity., therefore the Department is unlikely to issue any permits for repair or replacement of this structure.

We also wanted to briefly touch on the upstream flood control area. The conceptual plan that we discussed was to place a water control structure on the upper portion of an existing culvert so that during high water flood events, the culvert would have less capacity. Flooding easements must be obtained for all measurable increases to the 100-year profile for the design to be approved under NR 116 and Ozaukee County Floodplain Ordinance. An approval from FEMA must also be obtained for the 100-year profile increase. It is WDNR's understanding that FEMA will not allow an increase that results in additional or new flooding impacts to existing structures in a mapped floodplain area. We will need to review the entire plan for this area to determine our exact jurisdiction and whether we are concerned that the project will have a negative environmental impact on the existing wetland.

One of the most important environmental concerns that we will be considering in our review is that the various activities should not inhibit fish migrations.

Please let me know if there is any additional preliminary information needed at this time.

Sincerely,

Kathi Kramasz
Water Management Specialist

Cc: Mike Campbell-Ruekert and Mielke
Sharon Gayan, -WDNR

"Wawrzyn, William G "
<William.Wawrzyn@dnr.state.wi.us>
12/12/2005 01:13 PM

To <Jessica_Overmohle@URSCorp.com>
cc "Boldt, Susan" <susan.boldt@dma.state.wi.us>
bcc
Subject RE: Theinsville, WI EA: Pigeon Creek

History: This message has been replied to.

Pigeon Creek does support a diverse warmwater sport and forage fishery. I walked the project reach with Marty and most of the stream dating back to the late 80's. The project as proposed will provide a variety of benefits to fish, other aquatic life and wildlife;
1. Improve channel (bed and bank) stability by providing bank forming flows more frequent access to the floodplain at two locals (stream channel is not being widened but the overbank floodplain is),
2. Provide additional in-stream cover for fish and wildlife (e.g. snags),
3. Removal of aquatic life and wildlife barriers to migration specifically the enclosed reach at Green Bay Rd.

Pigeon Cr. is the largest and least impacted stream/watershed in the lower Milwaukee R. downstream of the Thiensville Dam and impoundment. The floodplain and wetland corridor along Pigeon Cr. once hydrologically re-connected as part of this project, will allow Lake Michigan potadromous and Milwaukee R. resident fish access to historical spawning grounds.

In anticipation of this project, we are working with an interested dam owner on Pigeon Cr. who is interested in removing another dam barrier on the creek. This later project would not be a high priority had the flood control project not included removal of other barriers.

If you need more information, please don't hesitate to call or e-mail.
Sincerely,
Will

Will Wawrzyn, Fisheries Biologist
Milwaukee River Basin Team
Wisconsin Department of Natural Resources
2300 N. Martin Luther King Jr. Drive
Milwaukee, Wisconsin 53212

phone: (414) 263-8699
fax: (414) 263-8716
e-mail: william.wawrzyn@dnr.state.wi.us

Visit the Fish & Habitat Web site:
http://dnr.wi.gov/org/water/fhp/fish/

"Kramasz, Kathleen M ."
<Kathleen.Kramasz@dnr.state.wi.us>

12/16/2005 08:16 AM

To "Wawrzyn, William G" <William.Wawrzyn@dnr.state.wi.us>, "Becky" <Rebecca.M.Gruber@mvp02.usace.army.mil>
cc <Jessica_Overmohle@URSCorp.com>
bcc
Subject RE: Theinsville, WI EA: Pigeon Creek

History: This message has been replied to

Jessica, Wisconsin DNR does not require mitigation for wetland impacts. Applicants can propose mitigation as part of their project but it is not a state requirement. The COE, however, does require mitigation and I have copied Becky Gruber on this e-mail so she can offer some guidance on what that agency's regulations are.

"Gruber, Rebecca M MVP "
<Rebecca.M.Gruber@mvp02.usace.army.mil>
08/17/2005 02:30 PM

To <Jessica_Overmohle@urscorp.com>
cc
bcc
Subject FEMA project - Theinsville, WI (Corps file 05-3765)

History: This message has been replied to and forwarded.

Jessica:

I appreciate you patience regarding the timing of my review (again, apologies for still taking a few days longer than I anticipated to review the paperwork).
I currently do not have any specific comments regarding the project itself. Once I review the project in more detail, I will have more substantive comments.
To that end, I agree that an EA is an appropriate level of review.
On a cursory level, I wonder if it would be possible to explore (I understand this would be limited by adjacent existing urban development) creek expansion coupled with creek rehabilitation (i.e. removal of anthropogenic structures like retaining walls, instead of replacing them further out from existing position). This would be a more-eco friendly manipulation that could be accomplished secondarily to the project purpose.
At this time I am not able to accurately estimate the acreage of impacts to waters of the U.S., so I can only guess as to the type of authorization required. Waters of the U.S. in this project will include Pigeon Creek (and it's associated wetlands) and the Milwaukee River (to include it's associated wetlands). I anticipate that this project would qualify for review as an Individual (or Standard) permit, which would be authorized under the provisions of Section 404 of the Clean Water Act.
Thank you for the opportunity to comment, I look forward to further co-ordination regarding this project.

Becky Gruber
USACOE, Project Manager

Also see record of phone conversation in Section 7.0

Appendix C
EO 11988 and EO 11990 Eight-Step Planning Process

Step 1: Determine whether the Proposed Action is located in a wetland and/or the 100-year floodplain, or whether it has the potential to affect or be affected by a floodplain or wetland.	**Project Analysis:** The Village of Thiensville is a participant in good standing with the NFIP. According to FEMA mapping, the Thiensville portion of the proposed project is located in the 100-year floodplain (Zone AE) of Pigeon Creek. According to resource maps and a wetland delineation completed by SEWRPC, there are wetlands in the project area.
Step 2: Notify public at earliest possible time of the intent to carry out an action in a floodplain or wetland, and involve the affected and interested public in the decision-making process.	**Project Analysis:** The Village of Thiensville has been actively involved in keeping the public informed about the proposed project through newspaper articles, meetings with affected residents, and letters to property owners adjacent to the project area. The Village of Thiensville proposes to finance their portion of the project by amending Tax Incremental Financing (TIF) District #1. A public hearing to discuss the proposed amendment and the proposed project plan was held on July 26, 2005. A public hearing notice was mailed to all property owners within the existing TIF District #1, which includes the downtown Thiensville project area. The meeting was also open to the general public. Project public involvement activities are summarized on page 5-1 of the EA.
Step 3: Identify and evaluate practicable alternatives to locating the Proposed Action in a floodplain or wetland.	**Project Analysis:** The Proposed Action includes the least amount of wetland impact that still allows for the project to proceed. Temporary wetland impacts will be caused during construction of the project, where fringe wetlands along Pigeon Creek would be excavated. No direct impacts are anticipated to wetlands associated with Basin 2. Other than the No Action Alternative, there are no practicable alternatives for improving flood conditions of Pigeon Creek that would not involve impacts to wetlands. The conveyance component of the Proposed Action is located within the 100-year floodplain. The Proposed Action would decrease the 100-year flood elevation of Pigeon Creek and would reduce the possibility of continued flooding to at least eight repetitive loss properties by removing them from the floodplain. The following alternatives were evaluated in the EA:

	Alternative 1: No Action *Alternative 2:* Proposed Action Widen three reaches of the Pigeon Creek channel, remove existing car lot culverts and replace with a 60-foot stream channel, widening and reconfiguration of riprap beneath Main Street Bridge, remove and replace two bridges, and install a new 70-foot pedestrian/utility bridge. Control outlet structure at Basin 2 to use natural storage capacity to achieve 58 acre-feet of necessary water storage to reach a target flood elevation of 659.5 in downtown Thiensville. *Alternative 3* Widen three reaches of the Pigeon Creek channel, remove existing car lot culverts and replace with a 60-foot stream channel, remove and replace two bridges, and install a new 70-foot pedestrian/utility bridge. Control outlet structures and excavate at Basins 2, 3, 4, and 5 to achieve 300 acre-feet of necessary water storage to reach a target flood elevation of 659.5 in downtown Thiensville. *Alternatives Considered but Eliminated* Sileno Quarry, located northwest of the Village of Thiensville in the City of Mequon, was considered as a water storage site (Basin 1). However, the WDNR voiced concerns over possible impacts to wetlands, natural habitat, water quality, and navigable waters, therefore this alternative was eliminated from further consideration. An all-storage alternative utilizing seven basins in the City of Mequon was also considered. This included Basins 1 though 5, as well as two additional basins in the same general area, providing 1,135 acre-feet of water storage. This alternative would require significant land and easement acquisition, which would significantly increase the cost of the project. In addition, it would require significant work in wetland areas. For these reasons, the all-storage alternative was eliminated from further consideration.

Step 4: Identify the full range of potential direct or indirect impacts associated with the occupancy or modification of floodplains and wetlands, and the potential direct and indirect support of floodplain and wetland development that could result from the Proposed Action.	**Project Analysis:** The project will result in temporary impacts to all identified wetlands. Excavation would take place at the fringe wetland areas along Pigeon Creek and in Wetland 1. Temporary erosion/sedimentation impacts to all wetlands in the project area would be controlled through use of BMPs. All impacted vegetation would be restored and enhanced with native plants after construction, and no long-term impacts to wetlands are anticipated.
Step 5: Minimize the potential adverse impacts to work within floodplains and wetlands to be identified under Step 4, restore and preserve the natural and beneficial values served by wetlands.	**Project Analysis:** The Applicant must follow all applicable local, State, and Federal laws, regulations, and requirements and obtain and comply with all required permits and approvals, prior to initiating work on this project. This will include a Section 404 permit and WDNR permit for wetlands. No staging of equipment or project activities shall begin until all permits are obtained. The Applicant must apply BMPs for soil erosion prevention and containment during staging of equipment and project activities. Should project activities be delayed for 1 year or more after the date of this EA, coordination and project review by the appropriate regulating agencies must be re-initiated. The proposed action will enhance the natural and beneficial functions of the 100-year floodplain by providing additional storage and reducing the flood elevation to 659.5 in downtown Thiensville. Additionally, native vegetation will be implemented post-construction to further enhance the floodplain environment. Impacts of other projects in the area will be reviewed as necessary to ensure that cumulative impacts to the floodplain are addressed.
Step 6: Re-evaluate the Proposed Action to determine: 1) if it is still practicable in light of its exposure to flood hazards; 2) the extent to which it will aggravate the hazards to others; 3) its potential to disrupt floodplain and wetland values.	**Project Analysis:** The Proposed Action remains practicable based on the objectives improving conveyance and reducing flood flows in Pigeon Creek.

Step 7: If the agency decides to take an action in a floodplain or wetland, prepare and provide the public with a finding and explanation of any final decision that the floodplain or wetland is the only practicable alternative. The explanation should include any relevant factors considered in the decision-making process.	**Project Analysis:** A public notice will be submitted informing of FEMA's decision to proceed with the project. This notice will include rationale for wetland impacts; a description of all significant facts considered in making the determination; a list of the alternatives considered; a statement indicating whether the action conforms to State and local wetland protection standards; a statement indicating how the action affects the wetlands; and a statement of how mitigation will be achieved.
Step 8: Review the implementation and post-implementation phases of the Proposed Action to ensure that the requirements of the EOs are fully implemented. Oversight responsibility shall be integrated into existing processes.	**Project Analysis:** This step is integrated into the NEPA process and FEMA project management and oversight functions.

Appendix D
Flood Easements
Basin 2 Area

FLOWAGE EASEMENT

RETURN TO:

Village of Thiensville-Clerk's Office

PARCEL NUMBER:

14-166-0000.002

RECITALS:

1. As part of a Flood Control Project, the City of Mequon ("City") and Village of Thiensville ("Village"), Wisconsin Municipal Corporations in Ozaukee County, Wisconsin desire to restrict flood flows through a culvert on Wauwatosa Road and raise the road to temporarily store flood waters on private property.

2. The City and Village (Grantees) desire to obtain a permanent flowage easement the purpose of which is to store flood water within the boundary of private property owned by Hawks Bluff Homeowners Association, Inc. (Grantors).

3. The Grantors are the riparian land owners of certain land ("Property") adjacent to a tributary of the Pigeon Creek where the same flows through. Said easement consists of the Grantors' interest in land contained within the following described tract:

   Outlot 2 of the Hawks Bluff Subdivision located in the NW 1/4 of Section three (3) Township Nine (9) North, Range Twenty-One (21) East in the City of Mequon, Ozaukee County, Wisconsin.

GRANT OF EASEMENT:

1. Grantors, for good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged, do hereby give and grant to the City and Village a flowage easement on the Property to permit surface water from the tributary of the Pigeon Creek to go upon the Property should the same become necessary to accommodate any backwater resulting from the damming effects of the road raising and culvert restriction hereinabove referred to.

2. The flowage easement for storage purposes shall cover the land area below elevation 779.00 NGVD 29 as indicated on the attached Exhibit 1.

3. Grantors warrant that they hold good title to the Property and have full right and authority to grant this easement.

4. This easement is granted as a covenant running with the land and shall be binding on all future owners of any interest in the Property.

5. Grantors shall make no use of the Property that interferes with the exercise of the rights granted to the City and Village by this easement.

6. Though the purpose of this project is to alleviate future flooding, the Village of Thiensville, City of Mequon and Grantor understand that it is possible that flooding will occur. FEMA and the State of Wisconsin are not responsible for any damages that may occur due to flooding and will

not be liable for any such damages. This project is approved on the best available engineering information available at the time of project review and implementation.

7. This easement will not take effect until the Village of Thiensville receives a Pre-Disaster Mitigation Competitive Grant administered through FEMA toward the Flood Control Project.

8. Grantees shall not disturb the easement area in any way except to construct and maintain the roadway, shoulder and culvert within the public right-of-way.

9. This easement does not infringe upon the rights of the Grantors to use their property for its intended purpose.

Grantor

3-23-06
Dated

ACKNOWLEDGEMENT

STATE OF WISCONSIN)
)ss.
OZAUKEE COUNTY)

Personally came before me this 23rd day of March, 2006 the above named David Braaten to me know to be the persons who executed the foregoing easement and acknowledged the same.

Dianne S. Robertson

(Print) Dianne S. Robertson

Notary Public, State of Wisconsin

My Commission is permanent.

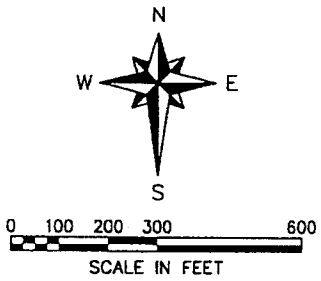
If not – Date of Expiration: 10/4/09

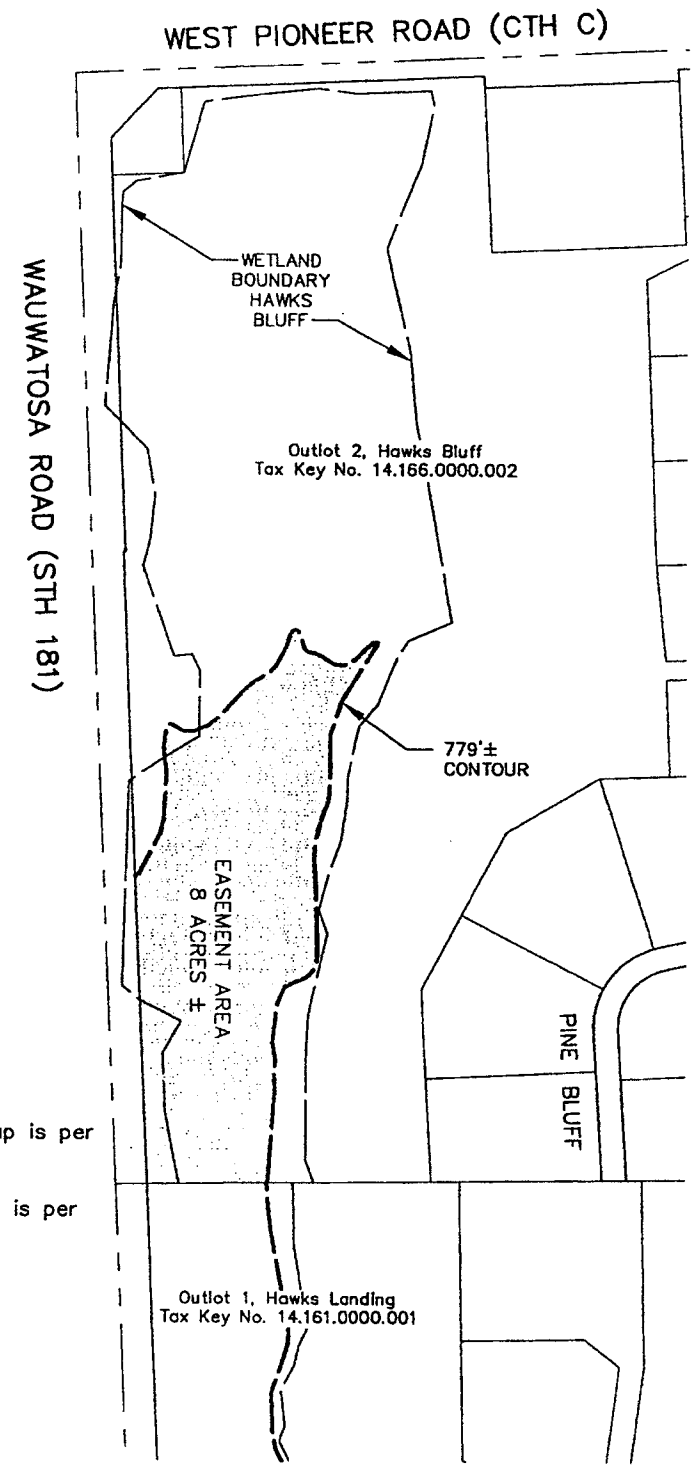
Project: Pigeon Creek Flood Control

EXHIBIT "1"

FLOWAGE EASEMENT

Being part of Outlot 2, Hawks Bluff Subdivision, located in part of the Northwest 1/4 and Southwest 1/4 of the Northwest 1/4 of Section 3, Town 9 North, Range 21 East, City of Mequon, Ozaukee County, Wisconsin.





OWNER/GRANTOR:
Hawks Bluff Homeowners Association, Inc.
c/o Dave Braaten
7620 W .Kings Way
Mequon, WI 53097
Outlot 2, Hawks Bluff
Tax Key No. 14.166.0000.002

NOTE(S):

1) Contour data shown on this map is per County Mapping and is not to be considered conclusive.
2) Parcel data shown on this map is per County Mapping and is not to be considered conclusive.
3) Area shown is approximate.

Ruekert·Mielke
engineering solutions for a working world

PREPARED FOR:
City of Mequon &
Village of Thiensville
Wisconsin

PREPARED BY:
Ruekert · Mielke
W233 N2080 Ridgeview Pkwy.
Waukesha, WI 53188

G:\Land\2192063\dwg\ExHawksBluff01.dwg

THIS INSTRUMENT WAS DRAFTED BY BRUCE K. CROSS, R.L.S. (03-06) CHECKED BY: MFC (03-06)

FLOWAGE EASEMENT

RETURN TO:

Village of Thiensville-Clerk's Office

PARCEL NUMBER:

14-161-0000-001

RECITALS:

1. As part of a Flood Control Project, the City of Mequon ("City") and Village of Thiensville ("Village"), Wisconsin Municipal Corporations in Ozaukee County, Wisconsin desire to restrict flood flows through a culvert on Wauwatosa Road and raise the road to temporarily store flood waters on private property.

2. The City and Village (Grantees) desire to obtain a permanent flowage easement the purpose of which is to store flood water within the boundary of private property owned by Hawks Landing-Mequon Homeowners Association, Inc. (Grantors).

3. The Grantors are the riparian land owners of certain land ("Property") adjacent to a tributary of the Pigeon Creek where the same flows through. Said easement consists of the Grantors' interest in land contained within the following described tract:

   Outlot 1 of the Hawks Landing Subdivision located in the SW 1/4 of Section Three (3), Township Nine (9) North, Range Twenty-One (21) East in the City of Mequon, Ozaukee County, Wisconsin

GRANT OF EASEMENT:

1. Grantors, for good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged, do hereby give and grant to the City and Village a flowage easement on the Property to permit surface water from the tributary of the Pigeon Creek to go upon the Property should the same become necessary to accommodate any backwater resulting from the damming effects of the road raising and culvert restriction hereinabove referred to.

2. The flowage easement for storage purposes shall cover the land area below elevation 779.00 NGVD 29 as indicated on the attached Exhibit 1.

3. Grantors warrant that they hold good title to the Property and have full right and authority to grant this easement.

4. This easement is granted as a covenant running with the land and shall be binding on all future owners of any interest in the Property.

5. Grantors shall make no use of the Property that interferes with the exercise of the rights granted to the City and Village by this easement.

6. Though the purpose of this project is to alleviate future flooding, the Village of Thiensville, City of Mequon and Grantor understand that it is possible that flooding will occur. FEMA and the State of Wisconsin are not responsible for any damages that may occur due to flooding and will

not be liable for any such damages. This project is approved on the best available engineering information available at the time of project review and implementation.

7. This easement will not take effect until the Village of Thiensville receives a Pre-Disaster Mitigation Competitive Grant administered through FEMA toward the Flood Control Project.

8. Grantees shall not disturb the easement area in any way except to construct and maintain the roadway, shoulder and culvert within the public right-of-way.

9. This easement does not infringe upon the rights of the Grantors to use their property for its intended purpose.

John Moore — 3/22/06

Grantor Hawks Landing Archt. Board Member Dated

ACKNOWLEDGEMENT

STATE OF WISCONSIN)
)ss.
OZAUKEE COUNTY)

Personally came before me this 22nd day of March, 2006 the above named Jordan Moore to me know to be the persons who executed the foregoing easement and acknowledged the same.

Dianne S. Robertson

(Print) Dianne S. Robertson

Notary Public, State of Wisconsin

My Commission is permanent.

If not – Date of Expiration: 10/4/09

Project: Pigeon Creek Flood Control

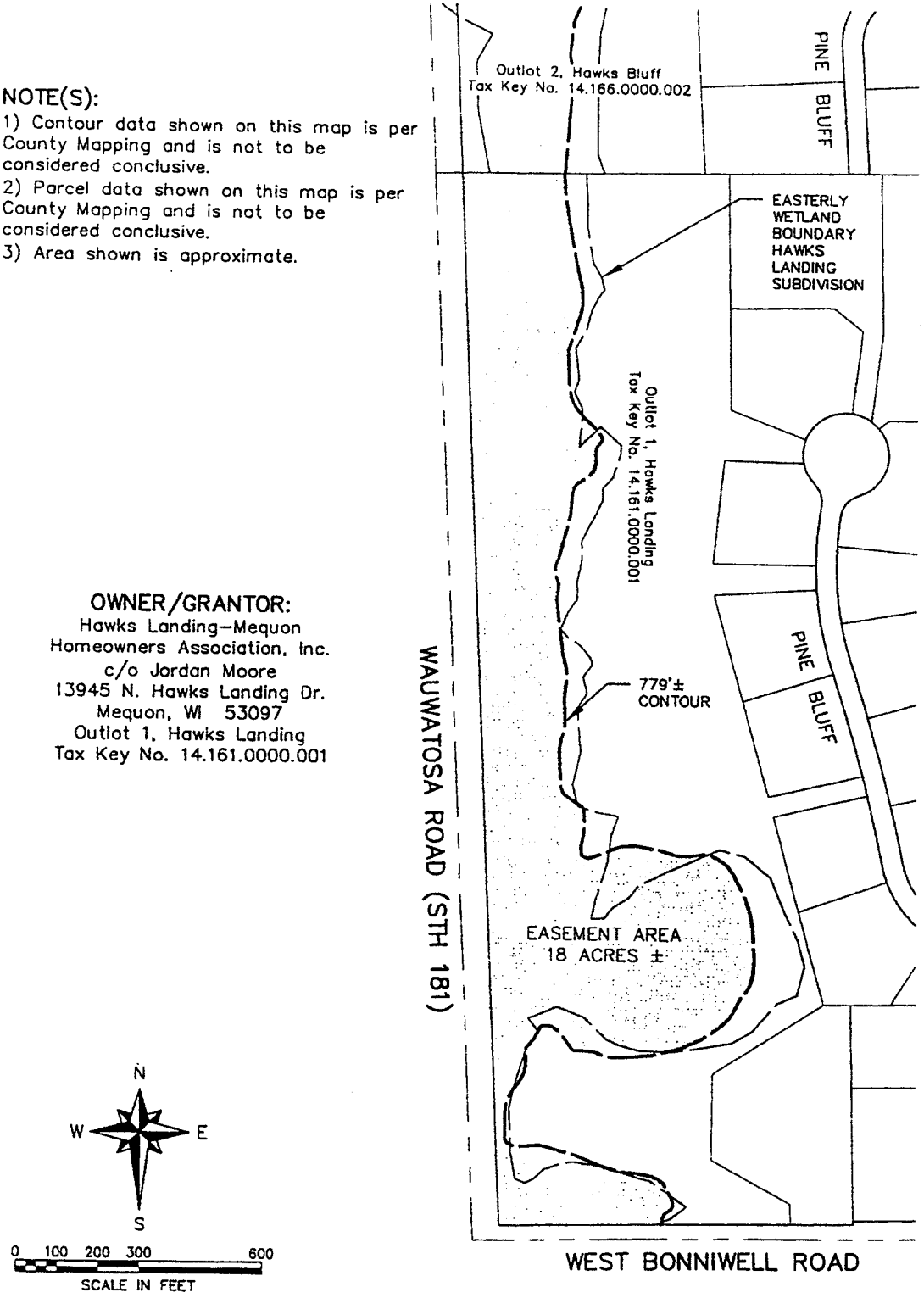
EXHIBIT "1"

FLOWAGE EASEMENT

Being part of Outlot 1, Hawks Landing Subdivision, located in part of the Northwest 1/4 and Southwest 1/4 of the Southwest 1/4 of Section 3, Town 9 North, Range 21 East, City of Mequon, Ozaukee County, Wisconsin.

NOTE(S):

1) Contour data shown on this map is per County Mapping and is not to be considered conclusive.
2) Parcel data shown on this map is per County Mapping and is not to be considered conclusive.
3) Area shown is approximate.



OWNER/GRANTOR:
Hawks Landing–Mequon
Homeowners Association, Inc.
c/o Jordan Moore
13945 N. Hawks Landing Dr.
Mequon, WI 53097
Outlot 1, Hawks Landing
Tax Key No. 14.161.0000.001

Ruekert·Mielke
engineering solutions for a working world

PREPARED FOR:
City of Mequon &
Village of Thiensville
Wisconsin

PREPARED BY:
Ruekert · Mielke
W233 N2080 Ridgeview Pkwy.
Waukesha, WI 53188

G: \Land\2192063\dwg\ExHawksLanding01.dwg

THIS INSTRUMENT WAS DRAFTED BY BRUCE K. CROSS, R.L.S. (03-06) CHECKED BY: MFC (03-06)

Appendix E
Public Notice

Federal Emergency Management Agency

PUBLIC NOTICE

Notice of Availability for Draft Environmental Assessment

For Pigeon Creek Flood Improvements, Village of Thiensville, Wisconsin

Environmental Assessment for Pigeon Creek Flood Improvements, Village of Thiensville, Ozaukee County, Wisconsin. PDMC-PJ-05-WI-2003-001.

The Proposed Action involves conveyance improvements along Pigeon Creek in downtown Thiensville, as well as upstream storage in the City of Mequon. The conveyance improvements include widening of three reaches of the channel, removal of existing culverts and replacement with a 70-foot stream channel, removal and replacement of two bridges, widening and reconfiguration of riprap beneath an existing bridge, and installation of a new 70-foot pedestrian/utility bridge. With the proposed conveyance improvements, approximately 58 acre-feet of storage will be utilized at an upstream site to achieve the target flood elevation of 659.5 feet in downtown Thiensville. The proposed storage component of the project is located approximately 1.5 miles northwest of Thiensville in the City of Mequon, and includes obtaining easements and controlling an existing outlet structure to make maximum use of natural storage capacity and achieve the necessary water storage.

The draft Environmental Assessment is available for review between March 23 and April 21, 2006 at Thiensville Village Hall, 320 Elm Street, and the Frank L. Weyenburg Library, 11345 North Cedarburg Road, during normal hours of operation. A public open house will be held to discuss the proposed project on March 27, 2006 from 5:30 PM to 7:00 PM at the Thiensville Fire Department Training Room, on the north side of 250 Elm Street. The draft EA is also available for review online at the FEMA website http://www.fema.gov/ehp/docs.shtm.

Written comments regarding this environmental action should be received no later than 5 PM on April 19, 2006, by Jeanne Millin, Regional Environmental Officer, 536 South Clark, 6th Floor, Chicago IL 60605-1521, or at Jeanne.Millin@dhs.gov.

If no comments are received by the above deadline, the draft EA will be considered final and a Finding of No Significant Impact will be published by FEMA.

The public may request a copy of the final environmental document from Jeanne Millin at the address listed above.