



Draft Environmental Assessment

# Plaster Creek Flood Mitigation Project

City of Grand Rapids, Kent County, Michigan

**FEMA DR-1346-MI, HMGP Application A1346.68**

*April 2006*



**FEMA**

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**DRAFT**  
**FINDING OF NO SIGNIFICANT IMPACT**  
**Plaster Creek Flood Mitigation Project**  
**Grand Rapids, Kent County, Michigan**  
**FEMA-DR-1346-MI, NEMIS ID #A1346.68**

The City of Grand Rapids in Kent County, Michigan, has applied for HMGP Section 404 funding under the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Grant funds are provided by Federal Emergency Management Agency (FEMA) under this program for disaster-related mitigation projects. The purpose of the Proposed Action is to provide flood protection from the 100-year flood to more than 100 residential structures along a portion of Plaster Creek in Grand Rapids, Michigan. This action would reduce or prevent damages to the residences, roads, and infrastructure from overland flooding during flood events. The need for this project is to minimize the economic loss and hardship to the community from the repeated damages. The Proposed Action would include the following four components; 1) increasing the height of an existing earthen levee on the south side of Plaster Creek to at least 1 foot above the 100-year flood elevation along its entire length (approximately 1,500 feet); 2) constructing a 700-foot long steel sheet pile floodwall on the south side of Plaster Creek north of Rosemary Street and east of Madison Avenue; 3) constructing a series of low earthen levees and modular block floodwalls to provide protection from the 100-year flood for homes along Union Avenue north of 28th Street and; 4) restoring the conveyance capacity of an existing diversion channel located on the southwest side of Plaster Creek. FEMA is proposing to provide assistance for this project through the Hazard Mitigation Grant Program (HMGP) under Presidential Disaster Declaration FEMA-DR-1346-MI and the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

In accordance with 44 Code of Federal Regulations (CFR) for FEMA, Subpart B – Agency Implementing Procedures, Part 10.9, an Environmental Assessment (EA) was prepared pursuant to Section 102 of the National Environmental Policy Act of 1969, as implemented by the regulations promulgated by the President’s Council on Environmental Quality (40 CFR Parts 1500-1508). The purpose of the EA was to analyze the potential environmental impacts for the Plaster Creek Flood Mitigation project and to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

Based upon the conditions and information contained in the EA for the Plaster Creek Flood Mitigation Project (April 2006) and in accordance with FEMA’s regulations in 44 CFR Part 10 (Environmental Considerations) and Executive Orders 11988 (Floodplain Management), 11990 (Protection of Wetlands), and 12898 (Environmental Justice), FEMA concluded the following:

A Finding of No Significant Impact. The proposed project, as described in the EA, will not result in any significant adverse impacts to existing land use, water resources (surface water, groundwater, wetlands, waters of the United States, and floodplains), air quality, noise, biological resources (vegetation, fish and wildlife, state-and federally listed threatened or endangered species and critical habitats), safety issues, hazardous materials and waste, and cultural resources, or result in disproportionately high or adverse effects on minority or low-income populations. Therefore, an Environmental Impact Statement will not be prepared.

APPROVAL

\_\_\_\_\_  
Ms. Jeanne Millin  
Regional Environmental Officer  
FEMA, Region V

Date: \_\_\_\_\_

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# List of Acronyms

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APE	Area of Potential Effect
ASTM	American Society for Testing and Materials
BFE	Base Flood Elevation
C-2	Community Commercial
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
dB	decibel
DNL	Day-Night Average Sound Level
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
EO	Executive Order
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
FONSI	Finding of No Significant Impact
G&O	Greenhorne & O'Mara, Inc.
H/H	Hydrologic and Hydraulic
HMGP	Hazard Mitigation Grant Program
HUC	Hydrologic Unit Code
LUST	Leaking Underground Storage Tank
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
NCA	Noise Control Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NREPA	Natural Resources and Environmental Protection Act
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
PCB	Polychlorinated Biphenyls
R-1	One-Family Residential
R-2	One-Family Auxiliary Residential
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Act Information System
SHPO	State Historic Preservation Officer
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank

## **1.1 PROJECT AUTHORITY**

Severe storms and flooding occurred on September 10 and 11, 2000, in the State of Michigan, leading the Federal Emergency Management Agency (FEMA) to issue a Federal disaster declaration, DR-1346-MI, on October 17, 2000. Under this declaration, Oakland and Wayne Counties became eligible for Individual Assistance, and all counties within the State became eligible for funding through the Hazard Mitigation Grant Program (HMGP).

The City of Grand Rapids in Kent County, Michigan, has applied for HMGP Section 404 funding under the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Grant funds are provided by FEMA under this program for disaster-related mitigation projects. In accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (Title 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 determine whether to prepare a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS) for the proposed project. As part of this NEPA review, the requirements of other environmental laws and Executive Orders (EOs) are also addressed.

## **1.2 PROJECT LOCATION**

The project is located in the City of Grand Rapids, Kent County, Michigan (Figure 1a and 1b). The project is located on the south side of Plaster Creek from Division Avenue to Union Avenue (Figure 2).

## **1.3 PURPOSE AND NEED**

The objective of the HMGP is to assist communities in recovering from the damage caused by natural disasters. The purpose of the action alternatives presented in this EA is to provide flood protection from the 100-year flood to more than 100 residential structures along a portion of Plaster Creek in Grand Rapids, Michigan. This action would reduce or prevent damages to the residences, roads, and infrastructure from overland flooding during flood events. The need for this project is to minimize the economic loss and hardship to the community from the costs associated with repeated damages.

There are 111 residential structures located within the 100-year floodplain of Plaster Creek that are susceptible to flooding from a 100-year storm event. Several of these homes have experienced flooding during storm events smaller than the 100-year storm. For example, on May 15, 2001, a storm estimated to be a 25-year event resulted in the direct flooding of six houses along Plaster Creek, and numerous other homes in the area experienced basement flooding and sanitary sewer backup.

## **2.1 ALTERNATIVE 1 – NO ACTION ALTERNATIVE**

Under the No Action Alternative, no improvements or flood mitigation measures would be implemented. The homes in the project area would continue to flood periodically, with the associated costs of damages to these homes and their contents estimated at \$294,000 annually.

## **2.2 ALTERNATIVE 2 – IMPROVEMENTS/ADDITIONS TO FLOOD CONTROL STRUCTURES (PROPOSED ACTION)**

The Proposed Action consists of four measures designed to protect residential structures from floodwaters, as described below and shown on Figure 3.

1. An existing earthen levee that is located on the south side of Plaster Creek and ties into existing embankments at Division Avenue and Madison Avenue would be raised to at least 1 foot above the 100-year flood elevation for its entire length of approximately 1,500 feet. This would require increases in the current height of the levee by approximately 1 to 3 feet at various locations along its length. The levee would be raised using earthen material and augmented by modular block walls for stability where required. A pump station would be constructed at the outfall to Plaster Creek near the vicinity of Ken-O-Sha Drive and Jefferson Avenue to pump stormwater (or interior drainage) over the bank and into Plaster Creek during flooding events. The pump station would be needed because the flap gate on the existing stormwater outlet to the creek remains closed under flood conditions on Plaster Creek. The pump station would consist of a 32-foot by 18-foot concrete vault containing three 4,000 gallon-per-minute capacity pumps that will be installed flush with the ground surface.
2. A 700-foot long steel sheet pile floodwall would be constructed on the south side of Plaster Creek north of Rosemary Street and east of Madison Avenue. The floodwall would be constructed to contain the 100-year flood and would extend at least 1 foot above the 100-year flood elevation along its length to provide freeboard requirements. The existing ground elevation is approximately 644 feet at the location of the proposed levee and the base flood elevation (100-year) ranges from 649 to 651 feet. Therefore, the floodwall would be approximately 5 to 7 feet above the existing ground level. The City would construct a supporting levee on the south side of the wall to buttress the wall and provide an area on which to install screening landscape.
3. A series of low earthen levees and modular block floodwalls would be constructed to provide protection from the 100-year flood for homes along Union Avenue north of 28th Street. These flood control structures would be constructed along the creek to protect residential structures, most of which have walkout basements, and would be tied into each other or into existing high ground. The type of flood protection structure to be built (low earthen levee or modular block floodwall) would depend on homeowner preference along this reach. The existing ground elevation ranges from approximately 651 to 652.5 feet in the vicinity of the proposed levees/floodwalls, and the base flood elevation in this area ranges from approximately 652.8 to 653.3 feet.



Therefore, the levees/floodwalls would be approximately 2 to 3.5 feet above the existing ground level.

4. An existing diversion channel, located on the southwest side of Plaster Creek, would be cleared of vegetation to restore the conveyance capacity of the channel. The diversion channel is approximately 22 feet wide with a 14-foot wide channel bottom. It is approximately 1 foot deep with 4:1 sloped sides. Flow is diverted into the channel when flood heights on Plaster Creek reach the elevation of the diversion channel. The diversion channel has become overgrown with shrubs and small trees, impeding the flow of floodwaters through the channel. The current flow rate for channel is approximately 14 cubic feet per second. After clearing the vegetation, the flow rate would be approximately 46 cubic feet per second.

The City of Grand Rapids has developed a maintenance plan to ensure that the conveyance capacity of the diversion channel and the proposed flood protection structures would be maintained. The City Environmental Services Protection Department would be responsible for implementing the maintenance plan.

### **2.3 ALTERNATIVE 3 –ACQUISITION AND RELOCATION/DEMOLITION (ACTION ALTERNATIVE)**

Under Alternative 3, 100 homes within the Plaster Creek floodplain would be purchased and either relocated or demolished. It is expected that most acquired homes would be demolished since there are few vacant properties in the nearby area available for relocating the homes. The cost for the purchase of these homes and the associated properties is estimated to be about \$12,000,000 to \$15,000,000. The purchased land would be maintained as open space by the City of Grand Rapids.

### **2.4 ALTERNATIVES CONSIDERED AND DISMISSED**

No other feasible alternatives were identified that address the purpose and need for the proposed project. Floodproofing the affected structures was dismissed as an alternative because it would not address the flooding effects of the sanitary sewer system during flood events.

## **SECTION THREE      Affected Environment and Environmental Consequences**

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Table 1 provides a summary of impacts associated with each alternative evaluated in this EA. Descriptions of the affected environments for the potentially impacted resources and the environmental consequences of each alternative to those resources are provided in the following sections.

### **3.1      PHYSICAL ENVIRONMENT**

#### **3.1.1      Geology, Seismicity and Soils**

This region is underlain primarily by Paleozoic bedrock, consisting of Pennsylvanian sandstone, shale, coal, and limestone, with smaller areas of Mississippian shale and gypsum and Mesozoic bedrock (USGS, 1998). Since the area was historically glaciated, exposed bedrock is rare. Typically, glacial deposits 350 to 400 feet thick bury the bedrock of sandstone, shale, and clay. The project area is located within a glacial outwash channel.

Kent County lies within a seismically inactive area. According to data available from the U.S. Geological Survey (USGS), there has been no recorded seismic activity in the southwestern Michigan region in the past 25 years (USGS EHP, 2002). The project area lies within a region indicated as having the lowest hazard potential for seismic activity (USGS EHP, 2002).

The area was historically composed of glacial till and outwash plains, forming a mosaic of alternating well and moderately well-drained rises and poorly to very poorly drained linear depressions along waterways and within valleys. Regionally, the soils have been classified as gently sloping Hapludalfs plus Agriaquolls (USDA, 1967).

The project area is located within the City of Grand Rapids, Michigan, in an area that has been developed for residential housing. As a result, a majority of the soils have been highly disturbed and are no longer representative of the soils originally present. The soils within and surrounding the site are currently classified as Urban land-Cohoctah complex (USDA, 1967), which is characterized by areas of urban land mixed with areas of nearly level, poorly drained Cohoctah soil. Locally, soils within the lowland hardwoods are undisturbed and characterized by alluvial deposits from flooding events; however, the Kent County Soil Survey designates the entire project area as the urban land complex. There are no prime or unique farmlands present and no farmlands of statewide or local importance within the project area.

#### **Alternative 1 – No Action Alternative**

The No Action Alternative would not impact the existing geologic or seismologic conditions of the area. Under the No Action Alternative, the area would remain residential, and there would be no impacts to the existing soils. The soils would continue to be subject to pesticides and manufactured fertilizers associated with residential development.

#### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

Implementation of the Proposed Action would have no impact on the existing geologic or seismologic conditions of the area. Under the Proposed Action, impacts would be similar to the No Action Alternative in that the area would remain residential, and the soils would continue to

**Table 1 – Impact Summary**

<b>Affected Environment</b>	<b>Location of Text Discussion (Section No.)</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2 Improvements/Additions to Flood Control Structures (Proposed Action)</b>	<b>Alternative 3 Acquisition and Relocation/Demolition (Action Alternative)</b>
Geology, Seismicity, and Soils	3.1.1	No impact. Highly disturbed urban soils.	Temporary impacts to soils during construction. Mitigation measures would be implemented to minimize erosion.	Temporary impacts to soils during demolition. Mitigation measures would be implemented to minimize erosion.
Water Resources and Water Quality	3.1.2	Flood events would continue to result in overbank flooding. Potential contamination from raw sewage and materials in residences would continue.	No adverse impacts. Overbank flooding of residences in 100-year floodplain would be eliminated using embankments and floodwalls, enhancing a floodway bypass, and a pump station; thereby altering surface water flow patterns and surface hydrology. Potential contamination from flooded residences would be reduced. The proposed project would comply with MDEQ Permit Number 04-41-0150-P, issued under Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act 451, PA 1994.	No adverse impacts. Flood events would continue to result in overbank flooding. Potential contamination from flooded residences would be eliminated.
Floodplain Management (EO 11988)	3.1.3	Overbank flooding of residences would continue.	Overbank flooding of residences in 100-year floodplain would be eliminated using embankments, enhancement of an existing floodway bypass, and a pump station. No	No adverse impacts. Overbank flooding would continue, but residential structures would be removed.

**Table 1 – Impact Summary**

Affected Environment	Location of Text Discussion (Section No.)	Alternative 1 No Action	Alternative 2 Improvements/Additions to Flood Control Structures (Proposed Action)	Alternative 3 Acquisition and Relocation/Demolition (Action Alternative)
			<p>substantial negative floodplain impacts are expected for areas upstream or downstream of the proposed project area. Water surface elevations would have an increase of up to 0.4 feet in the base flood elevation (BFE) for a portion of the study area. The construction of the levees and floodwall would cause a flow constriction, impacting the floodway and resulting in a slight increase in water surface elevations along the length of the project. Clearing the existing diversion channel would restore the conveyance capacity of the channel and reduce water surface elevations at the upstream end of the project. Although there would be slight increases in the BFE as a result of the project, floodplain widths are not expected to increase by more than 20 to 30 feet on either side of Plaster Creek and would not affect existing development or any privately owned land. The proposed project would</p>	

**Table 1 – Impact Summary**

Affected Environment	Location of Text Discussion (Section No.)	Alternative 1 No Action	Alternative 2 Improvements/Additions to Flood Control Structures (Proposed Action)	Alternative 3 Acquisition and Relocation/Demolition (Action Alternative)
			comply with MDEQ Permit Number 04-41-0150-P, issued under Part 31, Floodplain/Water Resources Protection, of the Natural Resources and Environmental Protection Act 451, PA 1994.	
Air Quality	3.1.4	No impact.	No impact other than short-term air emissions from construction equipment.	No impact other than short-term air emissions from construction equipment.
Terrestrial and Aquatic Environment	3.2.1	No impact. Periodic flooding of the urban ecosystem would continue.	Some vegetation would be impacted by construction of floodwall and excavation of diversion channels. Construction noise may have minor temporary impacts on breeding and nesting birds.	Urban ecosystem would be modified by removal of residences and associated landscaping. Habitats for birds and squirrels would be altered or eliminated.
Protection of Wetlands	3.2.2	No impact.	No impact	No impact.
Threatened and Endangered Species	3.2.3	No impact.	Not likely to adversely impact the Indiana bat ( <i>Myotis sodalist</i> ). To protect Indiana bats, no tree removal would be conducted from April 15 through September 15.	No impact.

**Table 1 – Impact Summary**

<b>Affected Environment</b>	<b>Location of Text Discussion (Section No.)</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2 Improvements/Additions to Flood Control Structures (Proposed Action)</b>	<b>Alternative 3 Acquisition and Relocation/Demolition (Action Alternative)</b>
Hazardous Materials	3.3	<p>Contaminants associated with two leaking underground storage tanks (LUSTs) located within 1/8-mile of the project site could be present in the project area and could come into contact with Plaster Creek floodwaters.</p> <p>Any hazardous materials discovered, generated, or used would be disposed of and handled by the City in accordance with applicable local, State, and Federal regulations.</p>	<p>Contaminants from two LUSTs located within 1/8-mile of the project site could be present in the project area and could potentially be encountered during construction of the Proposed Action.</p> <p>Any hazardous materials discovered, generated, or used would be disposed of and handled by the City in accordance with applicable local, State, and Federal regulations.</p>	<p>Contaminants associated with two leaking underground storage tanks (LUSTs) located within 1/8-mile of the project site could be present in the project area and could come into contact with Plaster Creek floodwaters; however, it is unlikely that project activities would disturb any hazardous materials.</p> <p>Any hazardous materials, including petroleum products, discovered, generated, or used would be disposed of and handled by the City in accordance with applicable local, State, and Federal regulations.</p>
Zoning and Land Use	3.4.1	No impact. Current zoning and land use would continue.	No impact. Current zoning and land use would continue.	Land use would change from residential to open space.

**Table 1 – Impact Summary**

<b>Affected Environment</b>	<b>Location of Text Discussion (Section No.)</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2 Improvements/Additions to Flood Control Structures (Proposed Action)</b>	<b>Alternative 3 Acquisition and Relocation/Demolition (Action Alternative)</b>
Public Services	3.4.2	No impact.	No impact.	No impact.
Socioeconomics and EO 12898	3.4.3	No impact.	Beneficial impacts associated with increased property values, elimination of residents’ economic loses from flooding, decreased expenses to City from flood cleanup and claims, and a noise and visual buffer provided to homes from proposed trail along Plaster Creek. No impact to communities under EO 12898.	Relocation of occupants of 111 residences; adverse impact to local businesses. Disruption of neighborhood integrity. No impact to communities under EO 12898.
Safety and Security	3.4.4	Safety and security would continue to be compromised by flood events.	Safety and security would be increased by preventing flooding from less than the 100-year flood events that lead to road failures and exposure to untreated sewage.	Safety and security would be increased by removing residents and structures from the 100-year floodplain, eliminating road thoroughfares and potential for exposure to untreated sewage.
Cultural Resources	3.5	No impact.	No impact.	No impact.

## **SECTION THREE**      **Affected Environment and Environmental Consequences**

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be subject to pesticides and manufactured fertilizers. The berm construction would prevent the soils within the 100-year floodplain from receiving nutrients and fines associated with flood-deposited sediments. Excavated soils would be disposed of in an approved facility and not in a floodplain or wetland.

Ground disturbing activities associated with construction of the berm and other proposed mitigation elements could temporarily increase erosion of soils to nearby surface waters. Mitigation measures, as described in Section 6, would be implemented to minimize impacts to soils.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

This alternative would not impact the existing geologic or seismologic conditions of the area. Under this alternative, the existing residential structures would be removed, and the soils would be subject to fewer impacts from compaction, fertilizers, and pesticides. The impervious surface area in the floodplain would be decreased, allowing more infiltration of precipitation. Excavated soils would be disposed of in an approved facility and not in a floodplain or wetland.

Ground disturbing activities associated with the demolition and relocation of homes in the floodplain could temporarily increase erosion of soils to nearby surface waters. Mitigation measures, as described in Section 6, would be implemented to minimize impacts to soils.

### **3.1.2 Water Resources and Water Quality**

Plaster Creek is part of the Lower Grand watershed (hydrologic unit code [HUC] 04050006) (EPA, 2002). Surface water drainage in this area of Grand Rapids includes a network of surface drains and storm sewers that are directed into Plaster Creek and ultimately, the lower Grand River. The sources of surface water into Plaster Creek are rainfall and snowmelt. Plaster Creek flows north into the project area and then makes a westerly turn, eventually flowing into the Grand River.

Two primary aquifers are located within the Lower Grand watershed, the Mississippian aquifer of Michigan and the Pennsylvanian aquifer. Lake Michigan is the main source of drinking water for the City. It is treated and pumped from a facility in Allegan County.

The Michigan Department of Environmental Quality (MDEQ) classifies Plaster Creek as a warm water fishery (MDEQ, 2001). The State also has designated the creek as suitable for partial body contact with water quality levels being unsuitable for swimming. The upper reaches of the creek are predominantly agricultural. The creek has traceable industrial elements and is high in nutrients. The industrial elements are primarily from parking lot runoff, and the nutrient loading is from upstream agriculture, residential lawn care products, and sewer backups during high water events. Sedimentation is a recurring problem due to the creek's steep profile in its upper reaches. During flood events, the creek receives increased pollution from urban runoff and sewer backups from adjacent residences.

The City of Grand Rapids, has obtained a permit from MDEQ (Permit Number 04-41-0150-P) under Part 301, Inland Lakes and Streams, of the Michigan Natural Resources and



## **SECTION THREE      Affected Environment and Environmental Consequences**

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Environmental Protection Act 451 (NREPA), PA 1994, as amended. The proposed project would comply with all requirements set forth in the permit.

### **Alternative 1 – No Action Alternative**

Under the No Action Alternative, potential contamination of Plaster Creek from raw sewage and materials in flooded residences would continue. There would be no changes to existing hydrology, surface water resources, or groundwater resources. Flood events would continue to result in overbank flooding since the capacity of the storm sewers and ditches would not change.

### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

The Proposed Action would have no long-term adverse impact on water quality in Plaster Creek. Elimination of residential flooding in the 100-year floodplain would greatly reduce some sources of potential contamination, such as lawn pesticides, fertilizers, and stored household chemicals.

No in-stream construction is planned for the Proposed Action. Construction and operation of the pump house should have no additional impacts to water quality. Runoff obstructed by the berms from adjacent low-lying streets would be pumped into Plaster Creek. The applicant would install a grit removal chamber for runoff to pass through before it is pumped to the creek.

Some short-term deterioration of water quality could occur during construction, but would be mitigated by implementing erosion control measures. Proper best management practices would be used during construction of the berm to reduce any sediment runoff. The berm would be stabilized with a variety of grasses and maintained by the City of Grand Rapids. The City of Grand Rapids, has obtained a permit from MDEQ (Permit Number 04-41-0150-P) under Part 31, Floodplain/Water Resources Protection, of the NREPA. The permit outlines mitigation measures for construction within the floodplain as well as establishes conditions to protect and preserve water quality both during and post construction of the proposed project. The proposed project would comply with all requirements as stated in the permit. A complete list of mitigation measures that would be used to minimize impacts to water resources is provided in Section 6.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

This alternative would have no adverse impact on water quality in Plaster Creek. Removal of residences in the 100-year floodplain would eliminate some sources of potential contamination during flood events. The site would revert back to open space and help to improve water quality by reducing impervious surfaces and associated stormwater runoff. Additional vegetation in the open space area would aid in trapping and filtering sediments, nutrients, and contaminants within the Plaster Creek watershed.

#### **3.1.3 Floodplain Management (Executive Order 11988)**

EO 11988 directs Federal agencies to minimize occupancy of and modifications to floodplains. Specifically, EO 11988 prohibits FEMA and other Federal agencies from funding construction within the 100-year floodplain unless there are no practicable alternatives. FEMA utilizes an eight-step planning process to avoid and minimize impacts to floodplains (Appendix B).

## **SECTION THREE**      **Affected Environment and Environmental Consequences**

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According to the *Flood Insurance Study (FIS)* for the City of Grand Rapids, Michigan, the project area is located within the 100-year floodplain of Plaster Creek (FEMA, 1982). Approximately 111 residential structures in the project area are located within the 100-year floodplain (Figure 4).

### **Alternative 1 – No Action Alternative**

Overbank flooding would continue to occur during flood events as no change would be made to the existing drainage system. Structures in the 100-year floodplain would continue to be flooded.

### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

Project activities would occur within the floodway of Plaster Creek (Figure 4).

The applicant conducted initial hydrologic and hydraulic (H/H) analyses that did not include all three main levee structures or the clearing of the existing diversion channel. Rather, the applicant's analyses contained just one of the proposed levees, a 700-foot long floodwall east of Madison Avenue along the southern bank of the creek, and two new diversion channels (which are not part of the Proposed Action). The analyses concluded that there would be adequate protection for structures in the area on Rosemary Street with minor increases (less than 0.1 feet) in upstream water surface elevations at Union Street for the 100-year event.

A separate H/H analysis, which included all components of the Proposed Action, was performed by Greenhorne & O'Mara, Inc. (G&O) and concluded that water surface elevations would have an increase of up to 0.4 feet in the base flood elevation (BFE) for a portion of the study area. The construction of the levees and floodwall would cause a flow constriction, impacting the floodway and resulting in a slight increase in water surface elevations along the length of the project. Clearing the existing diversion channel would help to restore the conveyance capacity of the channel and reduce water surface elevations at the upstream end of the project. The City of Grand Rapids has developed a maintenance plan to ensure that the conveyance capacity of the channel would be maintained. The maintenance plan (included as Appendix F) includes standard operating procedures for maintenance of the channel and the proposed flood protection structures. The City Environmental Services Protection Department would be responsible for implementing the maintenance plan. Although there would be slight increases in the BFE as a result of the project, floodplain widths are not expected to increase by more than 20 to 30 feet on either side of Plaster Creek and would not affect existing development or any privately owned land. Therefore, no substantial negative floodplain impacts are expected for areas upstream or downstream of the proposed project area.

Table 2 shows the resulting water surface elevations for the 100-year storm event for existing and post-project conditions at the cross sections taken from the FEMA FIS. Locations of the cross sections are depicted on Figure 5.

In the area between cross sections AO and AQ, there are BFE increases of between 0.2 and 0.3 feet. While there is extensive residential development on the north side of the creek, opposite the existing and proposed levees, the increase in floodplain width would not affect this development. Between cross sections AN and AO, on the north side of the creek (with BFE increase of 0.2 to

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0.4 feet), there is industrial and commercial development, but again the increase in the floodplain width would be limited and would not affect this development. From cross sections AN to AQ, properties along the north side of the creek that would be impacted by the increases in water surface elevations are owned by the City of Grand Rapids (public land) and the City of Grand Rapids School District (semi-public land). The City has a joint use of facilities agreement with the school board which allows for use of the property with the school board's consent, which has been given to the City. Therefore, properties affected by BFE increases occur on undeveloped land that is City property.

**Table 2. 100-Year Water Surface Elevations for Existing and Proposed Conditions**

<b>FIS Cross Section</b>	<b>RAS River Station</b>	<b>Existing 100-Yr Water Surface Elevation (ft)</b>	<b>Proposed 100-Yr Water Surface Elevation (ft)</b>	<b>Change in Water Surface Elevation (ft)</b>
AL	17559	641.5	641.5	-----
AM	18419	644.7	644.4	-0.3
AN	19299	647.1	647.5	0.4
AO	20008	649.4	649.6	0.2
AP	20157	649.5	649.8	0.3
AQ	21237	651.0	651.2	0.2
AR	22297	652.9	652.8	-.01
AS	22757	654.4	653.3	-0.1
AT	23232	655.9	655.3	-0.6

The applicant has acquired a permit under Part 301, Inland Lakes and Streams, of the NREPA, 1994 PA 451, as amended, for work in a waterway. The applicant has also acquired a permit under Michigan's Floodplain Regulatory Authority (Part 31, Water Resources Protection, NREPA) for construction within a federally identified flood hazard area.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

Under this alternative, there would be no changes to existing hydrology, surface water resources, or groundwater resources. Flood events would continue to result in overbank flooding because the capacity of the storm sewers and ditches would not change. When the site reverts back to open space, new vegetation would slow the transport of floodwaters through the area. Removal of the homes would provide some additional storage for floodwaters, reducing flooding downstream of the project area.

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### **3.1.4 Air Quality**

Information from the Environmental Protection Agency (EPA), Region V, indicates that all of Michigan is in attainment for all six criteria pollutants used as indicators of air quality. These pollutants are carbon monoxide, ozone, particulate matter, lead, sulfur dioxide, and nitrogen dioxide (EPA, 2005).

#### **Alternative 1 – No Action Alternative**

No construction would occur under the No Action Alternative; therefore, there would be no impacts to air quality.

#### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

There would be no discernable impacts to air quality under the Proposed Action. Some local and short-term increases in particulates and exhaust emissions could occur during construction of the berms. Under the Proposed Action, mitigation measures would be required to reduce construction-related impacts to air quality. These measures are detailed in Section 6 of this document.

#### **Alternative 3 – Acquisition and Relocation/Demolition (Alternate Action)**

There would be no discernable impacts to air quality under this alternative. Some local and short-term increases in particulates and exhaust emissions could occur from demolition of the acquired homes. Mitigation measures, as described in Section 6, would be implemented to minimize impacts to air quality.

## **3.2 BIOLOGICAL ENVIRONMENT**

### **3.2.1 Terrestrial and Aquatic Environment**

Biological resources in the project area and immediate vicinity are typical of an urban environmental setting. The project area contains a combination of residential development and forested riparian zone along Plaster Creek. In the residential areas, all of the original native plants have been removed and replaced with herbaceous and woody species (grasses, shrubs, and trees) planted for landscaping purposes. Native species present, such as red maple, are also generally transplanted for landscaping purposes.

The riparian zone along Plaster Creek contains a mixture of typical lowland hardwood vegetation, such as red maple, silver maple, sycamore, eastern cottonwood, green ash, and American elm. Within the forested areas, the understory is composed of more invasive species such as Japanese honeysuckle.

Wildlife is also representative of the urban environment. Common species include European starling, house sparrow, grackle, American robin, blue jay, cottontail rabbits, gray squirrels, and mice. Waterfowl such as geese and ducks are often associated with Plaster Creek.

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Stream surveys for macroinvertebrates have been conducted by the MDEQ within Plaster Creek. Among the macroinvertebrates sampled include various species of scuds, crayfish, snowbugs, true bugs, caddisflies, flies, limpets, and clams. The overall biodiversity of Plaster Creek ranges from “poor” to “acceptable” with habitat quality ranging from good to fair (MDEQ, 2001). No official fish survey has been conducted in Plaster Creek; however, MDEQ classifies the creek as a warm water fishery.

### **Alternative 1 - No Action Alternative**

The No Action Alternative would have no direct impacts on the vegetation, fish, and wildlife in the project area. Periodic flooding of the area would continue with sediments deposited on the vegetation and temporary displacement of mobile ground-dwelling fauna. Some indirect impacts would occur as characteristics of the residential area change, such as mature trees being removed which may or may not be replaced. Changes in the neighborhood landscaping would alter the local urban ecosystem.

### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

The Proposed Action would result in direct and indirect impacts during construction. Some vegetation may be eliminated by berm construction and enhancement of the existing floodway channel. However, the majority of the berm construction would occur outside the treeline of Plaster Creek. MDEQ expressed concerns over reduced canopy cover and stream temperature warming. The disturbance of trees from the berm placement along the stream would be minimal, causing little change to the existing canopy cover. The majority of the berm would be located within a proposed riverside trail; therefore, any disturbance to vegetation separate from the trail construction would be minimal. Understory vegetation would be removed within the existing floodway channel area to reduce friction, restore the conveyance capacity of the channel, and allow the water to flow and not backup during high water conditions, reducing the extent of flooding to the six homes along Union Avenue. This vegetation is primarily composed of invasive honeysuckle and immature canopy species.

Vegetation disturbed during construction would be restored using two methods. Areas that currently contain mowed and maintained lawn grasses would be restored with similar grasses. East of Madison Avenue and behind the homes along Rosemary, the existing topsoil would be reused to allow existing plant types re-establish except for areas immediately adjacent to the residential yards which would be seeded with lawn grasses. Forested areas east of Rosemary would also revegetated by reusing the existing soil to allow the existing plant types to re-establish. Mulch blankets would be used on slopes in all areas to prevent erosion while the vegetation re-grows.

Temporary noise associated with construction could disrupt breeding and nesting activities of birds and other wildlife.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

This alternative would have direct and indirect impacts on the local urban ecosystem. Removal of trees associated with the demolished residences would create a short-term elimination of

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feeding and nesting habitats for many of the bird species and squirrels that utilize the project area. Other species associated with residential areas would also be affected, such as cottontail rabbits, raccoons, opossums, and small rodents. Future use of the site under this alternative is unknown. If the site were to be reverted back to open space, additional habitat for both vegetation and wildlife would be provided. Under this “open space” scenario it is anticipated that both the numbers and diversity of the biotic community utilizing the site would increase.

### **3.2.2 Wetlands (Executive Order 11990)**

EO 11990, entitled “Protection of Wetlands,” directs Federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands and direct or indirect support of new construction in wetlands.

Historically, large portions of the Plaster Creek watershed have been drained and converted to agriculture. Today, many of these areas remain in agricultural production upstream, while areas within the City of Grand Rapids and surrounding jurisdictions have been developed. Although no formal wetland delineation has been performed, National Wetlands Inventory (NWI) maps were reviewed to identify wetlands within the project area. Coordination was also conducted with the MDEQ, Land and Water Management Administration, which indicated wetlands may exist within the vicinity of the Proposed Action (Appendix C). Although the letter states wetlands may exist in the “vicinity” of the project, no wetlands were observed in the proposed areas during the site visit.

The majority of the project area is located along steeply wooded slopes and elevated landscapes maintained by both the City of Grand Rapids and private homeowners. The NWI maps document the occurrence of a temporarily flooded palustrine forested wetland approximately 6 acres in size within the low-lying forested floodplain of Plaster Creek to the east of Goodwin Avenue (Figure 6). The water regime associated with this type of wetland has surface water present for brief periods during the growing season, but the water table usually lies well below the soil surface. Plants that grow both in uplands and wetlands are characteristic of this water regime (USFWS, 2002). Plaster Creek is classified as a lower perennial stream (R2) and is on average 15 to 20 feet wide with relatively steep slopes.

#### **Alternative 1 - No Action Alternative**

Under the No Action Alternative, no flood protection measures would be undertaken, and there would be no direct or indirect impacts to wetlands within the project area.

#### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

The existing diversion channel is located within a river floodplain, hardwood forest community. A preliminary site investigation indicated non-hydric deep alluvial soils with a vegetative community dominated by a facultative community of plants (those plants having a 33 percent to 66 percent probability of occurrence within a wetland). A few facultative wet species (those plants having a greater than a 66 percent probability of occurrence but less than a 99 percent probability of occurrence within a wetland), which are typical along river floodplains, were also noted. The site lacked signs of hydrology (i.e., sediment deposits, visual observation of

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inundation, visual observation of soil saturation, drainage patterns, and water-stained leaves) that would indicate the presence of a wetland. The area did not meet all the three wetland parameters of hydric soils, hydrophytic vegetation, and signs of hydrology which are required by the United States Army Corps of Engineers in determining wetland status. Therefore, this area is not considered a wetland, and the removal of vegetation within this floodway diversion channel is not anticipated to impact wetlands.

Berms would be constructed along previously disturbed land associated with the City of Grand Rapids and existing homes along Plaster Creek outside of the palustrine forested wetlands. The proposed berm location also does not appear to interfere with sources of surface water runoff into the existing wetlands, resulting in no anticipated alterations in wetland hydrology. This area is not considered a wetland. Therefore, no direct or indirect wetland impacts are anticipated with berm construction.

Any impacts to wetlands involving excavation and/or fill would require submittal of a permit application to the Land and Water Management Division of the MDEQ (refer to Section 6, Mitigation Measures and Permits). A delineation of jurisdictional wetlands would be conducted as part of this permitting process.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

Under this alternative, the wetlands within the project area would not be directly impacted. When the site reverts back to open space, the existing wetlands would improve in function as the vegetated buffer surrounding wetland areas would increase.

### **3.2.3 Threatened and Endangered Species**

The United States Fish and Wildlife Service (USFWS) and the Michigan Department of Natural Resources (MDNR), Wildlife Division, were asked to review their records to determine if the proposed project would impact rare, threatened, endangered, or otherwise significant plant and animal species, natural plant communities, or critical habitat (Appendix C). In a response letter dated May 11, 2005, the USFWS indicated that the proposed project is located within the endangered Indiana bat (*Myotis sodalis*) breeding range (Appendix C). In Michigan, the summer range of Indiana bats includes the southern half and most of the western coastal counties of the Lower Peninsula. Indiana bats are often found in forested wetlands with an open understory, though they can be found in a variety of forested landscapes, including riparian, bottomland, and upland areas.

In letters dated October 5, 2001, and May 24, 2005, the MDNR stated that, based on available information, the project should have no impact on rare or unique natural features in the project area (Appendix C).

### **Alternative 1 - No Action Alternative**

Based on coordination with the USFWS and MDNR (Appendix C), the No Action Alternative would not affect protected species.

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### **Alternative 2 –Improvements/Additions to Flood Control Structures (Proposed Action)**

Under the Proposed Action, a minimal amount of vegetation that could potentially provide habitat for the Indiana bat would be removed or disturbed during construction. To mitigate potential impacts to roosting Indiana bats, FEMA would require that no trees be removed from April 15 through September 15 as a condition of funding. Based on the minor disturbance to trees and the time of year restriction for vegetation removal, FEMA submitted a determination letter to USFWS on June 3, 2005, which stated that the Proposed Action is not likely to adversely affect the Indiana bat or its critical habitat, or jeopardize the continued existence of this species. On June 14, 2005, USFWS concurred with FEMA's determination.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

Alternative 3 would result in the disturbance and removal of limited amounts of vegetation that could provide habitat to the Indiana bat. To mitigate potential impacts to roosting Indiana bats, FEMA would require that no trees be removed from April 15 through September 15 as a condition of funding. Based on the minor disturbance to trees and the time of year restriction for vegetation removal, no impacts to threatened or endangered species or critical habitat are expected.

### **3.3 HAZARDOUS MATERIALS**

A database search was performed for the Plaster Creek Floodplain Mitigation Project to identify known regulated facilities involved with hazardous materials, hazardous wastes, or other environmental concerns. Both Federal and State databases were searched using distance criteria established under American Society for Testing and Materials (ASTM) standards. These databases identify various types of facilities, such as facilities that generate, treat, store, or dispose of hazardous materials; sites with registered underground or aboveground storage tanks; and locations where hazardous material spills have been reported.

The database search identified the following facilities in the project vicinity (within a 1/8-mile distance): four Leaking Underground Storage Tank (LUST) sites, seven registered Underground Storage Tank (UST) sites, one Resource Conservation and Recovery Act (RCRA) Large Quantity Generator site, three RCRA Small Quantity Generator sites, one Emergency Response Notification System (ERNS) site, and one Resource Conservation and Recovery Act Information System (RCRIS) Notifier site. The complete database report is presented in Appendix F.

- The City of Grand Rapids, Madison Avenue Bridge, Plaster Creek, (no address listed) is listed as a RCRA Small Quantity Generator of hazardous wastes. No further information was available from the database report.
- Valvoline Instant Oil Change, located at 640 28<sup>th</sup> Street, SE, is listed as a RCRA Notifier site; it is a Conditionally Exempt Small Quantity Generator. The site is also listed as a UST facility. Four USTs were removed from the site; no current tanks are listed for that address.
- Firestone Mastercare, located at 651 28<sup>th</sup> Street, SW, is a State UST site. A former used oil tank was removed from the site; no other tanks are listed for that address.



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- Michigan Department of Transportation Bridge M-11 over Plaster Creek (no address listed) was identified as a RCRA Large Quantity Generator. No further information was available from the database report.
- The address listed as 2600 Blk Division Avenue was identified in the ERNS. In 1993, a spill of approximately 45 gallons of polychlorinated biphenyls (PCBs) (greater than 50 parts per million) was reported at this location. No further information was available in the database report.
- Dan Liquidation, Inc. (formerly Granny's Kitchen), located at 613 28<sup>th</sup> Street, SE, was identified as a LUST and UST site. The remediation case is listed as "closed." One tank is currently listed for that address.
- Hitches by George, located at 727 28<sup>th</sup> Street, is a UST site. One tank was removed from the ground; no current tanks are listed for that address.
- The former Texaco Station at 749 28<sup>th</sup> Street, SE, is listed as a LUST and UST site. The remediation case is listed as "open." Two tanks were removed from the site but one tank remains.
- Duthler Ford Sales, Inc., located at 555 28<sup>th</sup> Street, SE, was identified as a LUST site, a UST site, and a RCRA Small Quantity Generator. The LUST case is listed as "closed." Two tanks were removed from the site; none remain.
- The 28<sup>th</sup> Street Value Market (Former Mobil 03-KA1) site, located at 2763 Madison Street, was identified as a LUST site, a UST site, and a RCRA Small Quantity Generator of hazardous wastes. According to the database information, four USTs are currently in use and four USTs have been removed. The remediation status of the LUST case is listed as "open." No further information was available from the database report.

The database search also identified 10 LUST cases and two RCRA sites located within a 1/8- to 1/4-mile radius of the project area. Of the 10 LUST cases, seven have been closed. Due to distance and topography, it is unlikely that contaminants from any of the three open LUST cases would impact the proposed construction area. The RCRA sites are associated with two bridge sites, and the listings were most likely related to construction activities. Therefore, no hazardous material impacts associated with these listed sites are anticipated in the project area from implementation of any of the project alternatives.

### **Alternative 1 - No Action Alternative**

Under the No Action Alternative, no flood mitigation measures would be implemented. If contaminants associated with the two LUST cases are present in the project area, they could come in contact with floodwaters and be transferred to Plaster Creek.

### **Alternative 2 –Improvements/Additions to Flood Control Structures (Proposed Action)**

Of the four LUST cases identified within a 1/8-mile radius of the project area, two cases have been closed, meaning no further investigation or remediation is required, and two cases remain open. One of the two open LUST cases is located upstream and to the south of Plaster Creek.

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Work in this area would be conducted on the north side of the creek. Contaminated groundwater from the LUST site, if present, would most likely flow into the creek and would not be encountered by construction.

The second open LUST case involves a release from a gasoline station located upgradient and less than 1,000 feet from the project area. Depending on the type and amount of material released from the LUST, contamination could have migrated into the project area. Construction specifications for the Proposed Action should include information on the potential for petroleum contamination in the area. If petroleum substances are encountered during construction, work at the site would cease until the contamination is assessed and a plan is put in place to prevent further migration of the contamination.

Any hazardous materials, including petroleum products, 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 – Acquisition and Relocation/Demolition (Action Alternative)**

Under Alternative 3, there is the potential for contaminants, if present, to come in contact with floodwaters and be transferred to Plaster Creek, but it is unlikely that project activities would disturb any hazardous materials. Any hazardous materials, including petroleum products, discovered, generated, or used during implementation of Alternative 3 would be disposed of and handled by the City in accordance with applicable local, State, and Federal regulations.

## **3.4 SOCIOECONOMICS**

### **3.4.1 Zoning and Land Use**

The project area is zoned as one-family residential (R-1), one-family auxiliary residential (R-1A), and community commercial (C-2) (Figure 7). The berm construction, floodway diversion channel enhancement, and proposed pump station would occur within City-owned property along Plaster Creek, bordered by the designated residential and commercial uses.

The existing land use in the project area is classified as lowland and central hardwood forest, single family duplex, and neighborhood business (Figure 8). The project area is bordered by single-family duplex and neighborhood business land use classifications. There are approximately 111 residences within the project area.

### **Alternative 1 – No Action Alternative**

Under the No Action Alternative, the current zoning and land use would continue.

### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

The Proposed Action is a municipal infrastructure project that meets engineering standards. The berms would be designed and constructed to meet the Army Corps of Engineers' standards for 100-year flood protection.

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The proposed project is consistent with existing land use in the area and would not conflict with any existing local zoning ordinances. The current zoning and land use would continue.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

Under Alternative 3, zoning would change from R-1 and R-1A to Floodplain (F). The existing residential land use would become open space, owned and maintained by the City and with potential use for recreational activities.

#### **3.4.2 Public Services and Utilities**

Public services in the project area include residential city streets and utilities (gas, electricity, water, storm sewers, and sanitary sewers), along with telephone and cable services for residences. None of the streets in the project area is a major thoroughfare for the City. Overbank flooding has caused periodic street closures and backup of the storm and sanitary sewers.

### **Alternative 1 – No Action Alternative**

Under the No Action Alternative, public services and traffic in the local community would continue to be subjected to periodic interruptions by overbank flooding.

### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

Under the Proposed Action, overbank flooding resulting from the 100-year or smaller storms would be prevented by the construction of embankments and floodwalls. The existing floodway diversion channel would be enhanced by removing thick understory vegetation to reduce friction and pooling of water, and a pump station would remove stormwater from the local neighborhood when the creek level is higher than the level in the surrounding area. Public streets and services would no longer be subjected to interruptions and damage, reducing economic costs to the City (as well as private utilities) from repair and maintenance and inconvenience to the residents in the project area.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

Under this alternative, no residences would remain within the 100-year floodplain. Public streets in the project area would no longer be needed to access the residential areas, and therefore may be closed or subject to limited traffic. Gas, electric, and sanitary services within the area would be eliminated or reconfigured for limited usage. No impacts to utility service would occur to homes not demolished under this alternative.

#### **3.4.3 Socioeconomics and Environmental Justice (Executive Order 12898)**

According to 2000 data from the U.S. Census Bureau, the population of Grand Rapids is approximately 197,999. Of the total City population, approximately 67 percent is white, 20 percent is black, and 13 percent is of Hispanic origin (U.S. Census Bureau, 2002).

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The project area is located within the City of Grand Rapids Census Tract #41. The population within this tract is 5,054 (U.S. Census Bureau, 2002). Of the total census tract population, approximately 73 percent is white, 22 percent is black, and 5 percent is of Hispanic or other origin (U.S. Census Bureau, 2002). The median income per household for Grand Rapids is \$44,512.

EO 12898, entitled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” directs Federal agencies to make achieving environmental justice part of their mission by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations in the U.S. The EO fosters non-discrimination in Federal programs that substantially affect health or the environment. This is achieved in part by providing minority and low-income communities greater opportunity for public participation and public information for issues that affect their communities. The community surrounding the project site is not considered a minority or low-income population.

### **Alternative 1 – No Action Alternative**

The No Action Alternative would have no adverse impacts to minority or low-income populations subject to EO 12898 (Environmental Justice).

### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

The Proposed Action would have beneficial effects on the local residents within the project area. Area residents would no longer be subject to economic losses from flooding, and property values would likely increase. City maintenance costs associated with clean up from flooding would likely decrease. Residents along Rosemary Street, east of Madison Avenue would experience additional benefits of a visual and noise barrier from the construction of the berm. The City of Grand Rapids is in the process of placing a multi-use path along Plaster Creek. The path will be located at the creek side base of the berm. Therefore, the berm would act as a partial noise barrier and a visual barrier between the trail users and adjacent residences.

The Proposed Action Alternative would have no adverse impacts to minority or low-income populations subject to EO 12898 (Environmental Justice).

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

This alternative would have adverse impacts on the local social and economic environment. Approximately 111 residential structures would be eliminated and occupants of these structures would be displaced. There would be the potential for some adverse economic impacts to local businesses from loss of customers and clients if residents relocated out of the area. As the land would revert to the City of Grand Rapids, recreational values associated with increased open areas would be expected to increase.

This alternative would have no adverse impacts to minority or low-income populations subject to EO 12898 (Environmental Justice).

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### **3.4.4 Safety and Security**

Erosion and soil saturation during flood events could result in road failures in the project area. Flood events also cause sanitary sewers to backup into structures, resulting in untreated sewage entering the residences and potentially Plaster Creek. These conditions could threaten the safety and security of local residents.

#### **Alternative 1 – No Action Alternative**

Under the No Action Alternative, the safety and security of the local population would continue to be compromised by overbank flooding during the 100-year flood event, and in some cases smaller storms.

#### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

Under the Proposed Action, flooding resulting from the 100-year or smaller event would be prevented by the construction of embankments and floodwalls. An existing floodway bypass would be enhanced by removing thick understory vegetation to reduce friction and pooling of water, and a pump station would remove stormwater from the local neighborhood when the creek level is higher than the surrounding area. Public safety and security would be improved by the reduction in floodwaters within the community. Citizen safety would be improved through the reduction in potential exposure to untreated sewage from backed up drains.

The City would implement the mitigation measures outlined in Section 6 to ensure public safety both during and after construction.

#### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

Under this alternative, no dwellings would exist within the 100-year floodplain. Public safety and security would be improved by reducing the potential for exposure to untreated sewage.

### **3.4.5 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 being 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 of 1972 (NCA). Although the NCA gives the EPA authority to prepare guidelines for acceptable ambient noise levels, it only charges those Federal agencies that operate noise-producing facilities or equipment to implement noise standards. The EPA's 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

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typically associated with construction equipment can measure as much as 80 dB within 50 feet from the source, attenuating at a rate of 6 dB per doubling of distance away from the source.

### **Alternative 1 – No Action Alternative**

Under the No Action Alternative, no construction would occur and no additional noise would be generated. Noise levels would be expected to remain at current levels.

### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

Most noise associated with the Proposed Action would be emitted by mechanical equipment used during construction activities. Equipment used would include backhoes, excavators, and dump trucks. This noise would be temporary, occurring only during daylight hours and only for the duration of construction. To mitigate potential noise impacts, the City would be required to inform residents of the construction period and potential noise impacts, as well as suggested mitigation measures, such as closing windows during construction or planning daily errands around construction times.

No long-term noise impacts are anticipated.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

Noise impacts associated with Alternative 3 would be similar to those discussed above for the Proposed Action.

To mitigate potential noise impacts, the City would be required to inform residents of the construction period and potential noise impacts, as well as suggested mitigation measures, such as closing windows during construction or planning daily errands around construction times.

### **3.4.6 Visual Resources**

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

The landscape character of the project area is predominantly suburban, consisting of mixed commercial and residential areas with areas of riparian forest along both sides of Plaster Creek. The project area possesses a high degree of visual fragmentation due to an extensive road network and mixed zoning. People in the viewshed of the proposed project area are residents, employees of local businesses, and travelers on Division Street, Union Avenue, Madison Avenue, Rosemary Street, and other residential streets in the project area.

### **Alternative 1 – No Action Alternative**

Under the No Action Alternative, no construction would occur; flooding would continue to occur, which could negatively impact visual resources in the project area.

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### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

Under Alternative 2, construction of earthen levees, a steel sheet pile floodwall, and modular block floodwalls would alter the current landscape; however, the City would install screening landscape to minimize impacts to visual resources. Additionally, homeowners would have input on portions of the design and the extent of impact to visual resources on their property when choosing between earthen levees or modular block floodwalls. The Proposed Action would benefit visual resources in the project area by removing debris and overgrown vegetation from the channel and allowing water to flow, rather than back up and cause flooding. Overall, no significant impacts to visual resources are expected.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

Under Alternative 3, properties currently located in the Plaster Creek floodplain would be demolished or relocated, and the floodplain would be maintained as open space. The landscape would be altered under this alternative; however, the addition of open space in the City would be considered a benefit.

## **3.5 CULTURAL RESOURCES**

Consideration of impacts to cultural resources is mandated under Section 106 of the National Historic Preservation Act (NHPA), as amended, and implemented by 36 CFR Part 800. Requirements include identification of significant properties that may be impacted by a proposed action. 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 project’s APE, the Federal agency must also determine in consultation with the appropriate State Historic Preservation Officer (SHPO) what effect, if any, the action would have on historic properties. Moreover, if the project would have an adverse effect on these properties, the Federal agency must consult with the SHPO on ways to avoid, minimize, or mitigate the adverse effects.

In response to the initial request for project review, the Michigan SHPO responded in a letter dated October 4, 2001, that no historic properties are affected within the project’s APE (Appendix C). In a determination letter dated March 17, 2006, FEMA concluded that no historic properties would be affected as a result of the proposed project.

### **Alternative 1 – No Action Alternative**

Under the No Action Alternative, no flood mitigation measures would be implemented, and no historic properties would be affected.

## **SECTION THREE      Affected Environment and Environmental Consequences**

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### **Alternative 2 – Improvements/Additions to Flood Control Structures (Proposed Action)**

No historic properties would be affected by the Proposed Action. Installation of the pump station will require excavation to install the 32-foot by 18-foot concrete vault housing the pumps. If artifacts or human remains are found during construction of the Proposed Action, the City must cease work immediately and notify FEMA and the SHPO.

### **Alternative 3 – Acquisition and Relocation/Demolition (Action Alternative)**

No historic properties would be affected by Alternative 3. If artifacts or human remains are found during activities associated with demolition of the houses under this alternative, the City must cease work immediately and notify FEMA and the SHPO.



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 nonfederal) or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time.

The current system of berms and floodway channels is not able to prevent flooding from Plaster Creek. Improvements to these berms and channels are needed to address flooding of existing residences in the project area. The area in the vicinity of the project area is built out and no new development is anticipated.

Mitigation measures would be implemented to lessen the impacts of the Proposed Action on natural, cultural, and socioeconomic resources (Section 6). Future projects should be thoroughly assessed to determine their overall impact to resources within the watershed.

*The following is to be completed when the Preliminary Draft EA is approved by FEMA for public review:*

A public notice advertising the availability of the draft EA and FONSI for public review was published in the Grand Rapids Press on April 17 and 18, 2006 and was available for review online at the FEMA website: [http://www.fema.gov/plan/ehp/Env\\_assessments/EA\\_RegV](http://www.fema.gov/plan/ehp/Env_assessments/EA_RegV) (Appendix D). The EA was also available for review at the Grand Rapids City Clerk's Office, 300 Monroe NW, Grand Rapids, Michigan, and the Grand Rapids Public Library, 111 Library Street NE, Grand Rapids, Michigan. The public was provided the opportunity to review the EA and comment on the Proposed Action from April 17 to May 17, 2006. FEMA Region V office collected and compiled comments submitted by the public.

*At the conclusion of the public review period, a summary of comments will be provided here, and copies of comments received will be provided in Appendix E.*

The following is a summary of mitigation measures that would be implemented for both Alternatives 2 and 3 (except where noted) in order to reduce or eliminate the potential for adverse environmental impacts:

1. Construction would be limited to minimize soil exposure. Construction periods would be planned to avoid heavy rain and storm seasons to prevent erosion at the site.
2. Excess soils would be removed from the sites immediately following vegetative clearing. Topsoil would be retained for re-use in areas requiring revegetation. Temporary stock piles of topsoil would be protected to prevent erosion.
3. Trucks hauling soil and fill material onto and from the site would be covered.
4. If soil debris were tracked from service vehicles onto the roadways, roadways would be watered down to eliminate dust and debris from compromising air quality.
5. Mulch blankets or similar measures would be used to prevent sedimentation and erosion of soils from the berms and excavated areas.
6. Disturbed areas, including the berms proposed under Alternative 2, would be immediately stabilized to prevent erosion, runoff, and sedimentation.
7. All feasible vegetation surrounding the berms would be left on site. Only vegetation that would hinder the berm's construction would be removed. (Alternative 2)
8. Upon completion of construction/demolition, any areas disturbed by heavy equipment would be mulched or seeded.
9. The completed berms would be graded to suit the existing topography and natural drainage patterns. The City of Grand Rapids would maintain and ensure the long-term maintenance and mitigation of drainage gullies or other erosion patterns that may develop along the berms. (Alternative 2)
10. Construction specifications for the Proposed Action should include information on the potential for petroleum contamination in the area. If petroleum substances are encountered during construction, work at the site should cease until the contamination is assessed and a plan is put in place to prevent further migration of the contamination. Any hazardous materials, including petroleum products, 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.
11. Construction would be limited to daylight hours to minimize noise impacts to area residents.
12. The City of Grand Rapids would provide upkeep and maintenance to the berms and areas surrounding the berms within City property. (Alternative 2)
13. During construction/demolition activities, the site would be cordoned off from the public and adequate construction signs would be posted to prevent injuries.
14. The City of Grand Rapids would be responsible for keeping the berms secure from pedestrian and biker traffic that may damage the slopes. (Alternative 2)
15. In accordance with the maintenance agreement and standard operating procedures presented in Appendix F, the City of Grand Rapids shall maintain all flood protection components of

the project and shall ensure that the conveyance capacity of the diversion channel is maintained at all times. (Alternative 2)

16. In accordance with Section 106 of the NHPA, upon the discovery of any artifacts, all construction activities within the immediate vicinity shall cease. FEMA and the Michigan SHPO shall be consulted for further instruction and guidance.
17. To mitigate potential impacts to roosting Indiana bats, tree removal shall not be conducted in any project areas during the period of April 15 through September 15.

The following permits have been obtained for implementation of the Proposed Action:

1. A permit under Part 301, Inland Lakes and Streams, of the Michigan NREPA for work in a waterway.
2. A permit under Michigan's Floodplain Regulatory Authority (Part 31, Water Resources Protection, NREPA) for construction within a federally identified flood hazard area.

All conditions stated in the permits mentioned above would be complied with throughout the planning and construction periods.

No permits would be required for implementation of Alternative 3.

The following agencies were consulted during preparation of this EA:

### Federal Agencies

Federal Emergency Management Agency

U.S. Fish and Wildlife Service

### State and Local Agencies

Michigan Department of Natural Resources, Wildlife Division

Michigan Department of Environmental Quality, Land and Water Management Division

Michigan State Historic Preservation Office

Michigan Department of State Police

City of Grand Rapids, Environmental Protection Services Department

### Distribution

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Vincent Parisi, FEMA Region V

Bruce Menerey, Michigan Department of Environmental Quality

Matt Schnepf, Michigan Department of State Police, Emergency Management Division

### References

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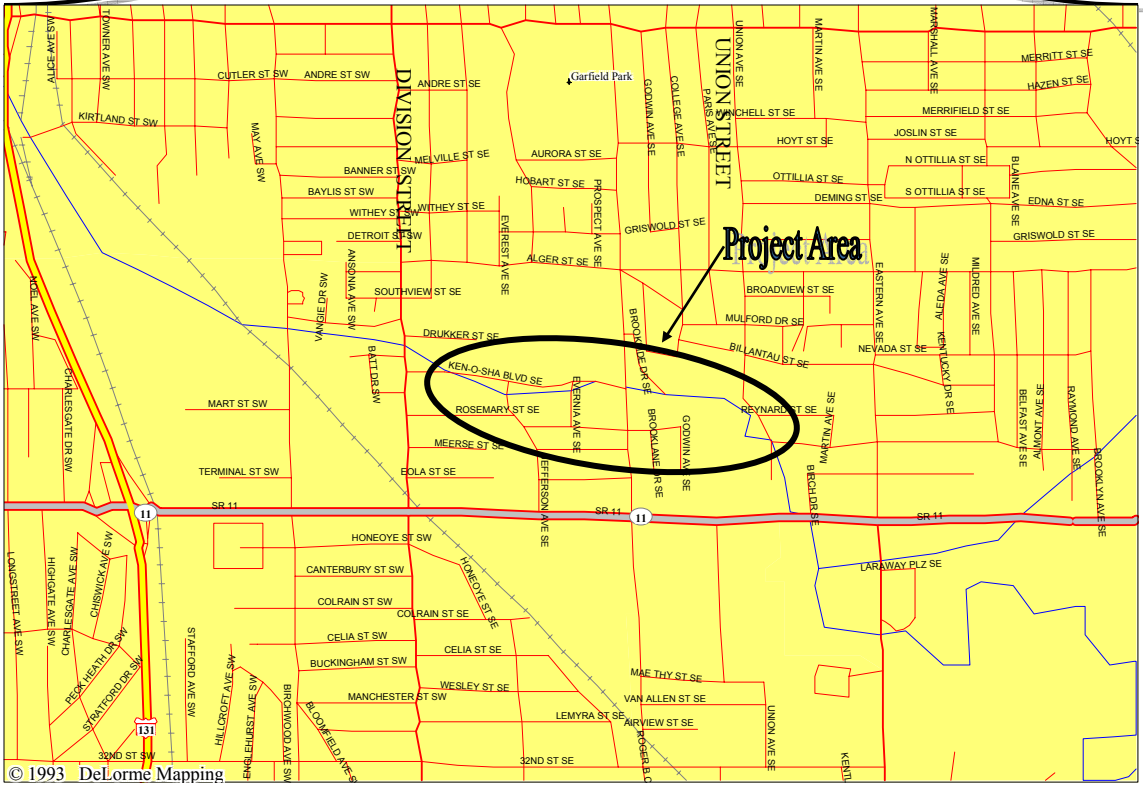
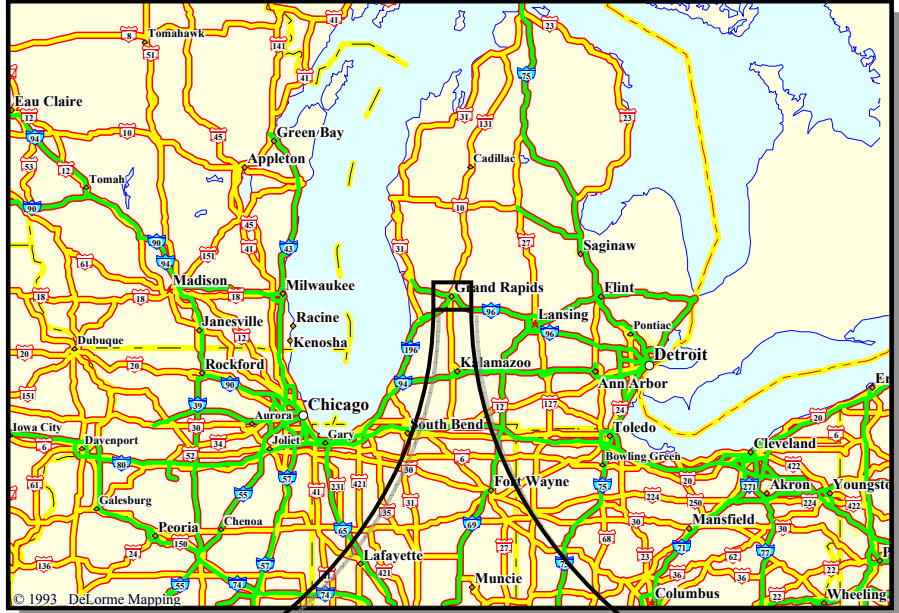
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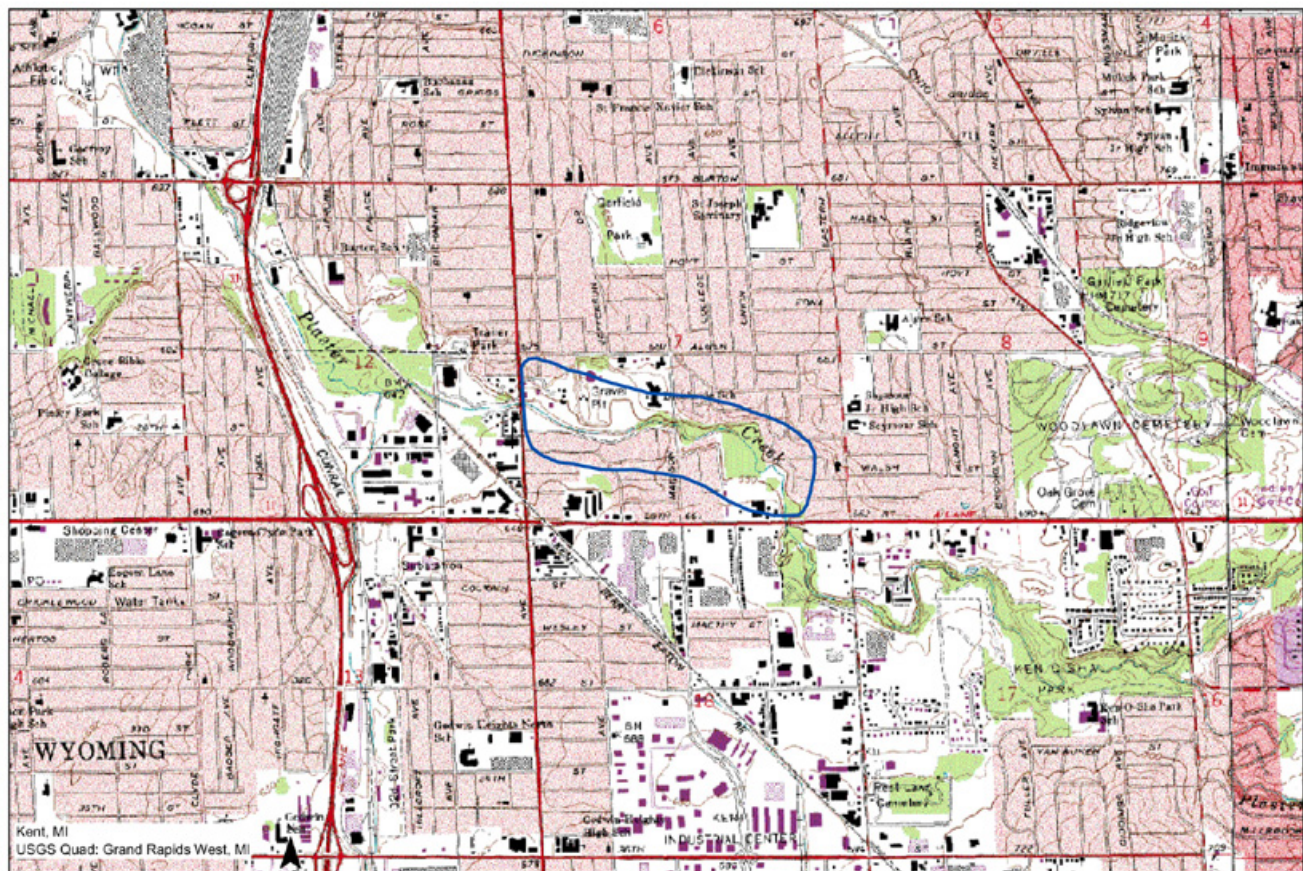
## **Figures and Photographs**





CLIENT FEMA				
PROJ Plaster Creek Floodplain Mitigation				
UHYVIRQHR	DES BY			
SCALE	NOT TO SCALE	DR BY	DK	3-3-03
FILE B9-FEMA4138.00\Reports\Draft\100.68\Reg Map.ppt		CHK BY	LF	3-3-03

TITLE	REGIONAL MAP
<b>URS</b>	
PROJ NO	15292488
FIGURE	1A



 Project Area

CLIENT: FEMA		
PROJ: Plaster Creek Floodplain Mitigation		
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TITLE: Vicinity Map	
	FIGURE: 1B





Figure 2. Project Area  
 Plaster Creek Floodplain Mitigation



Prepared by:



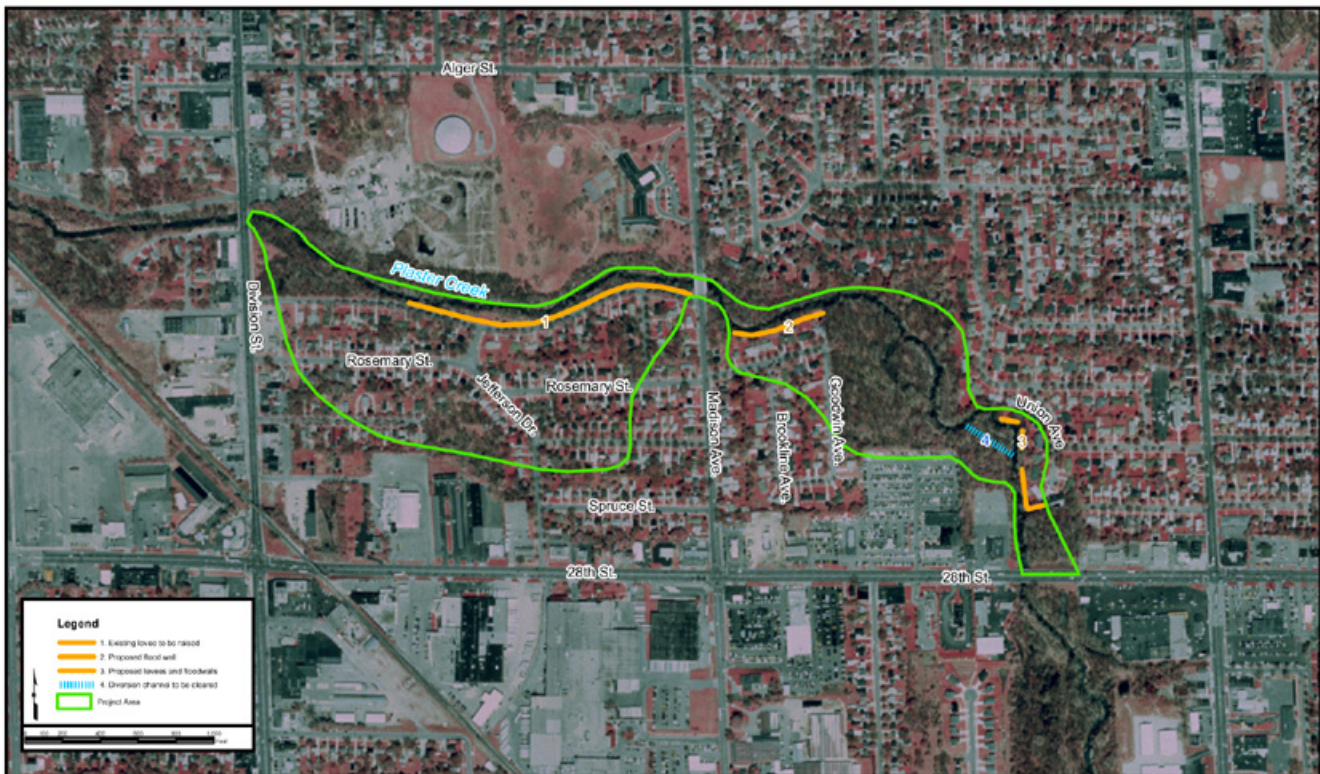


Figure 3. Proposed Action Alternative  
Plaster Creek Floodplain Mitigation

Prepared by:



Client:





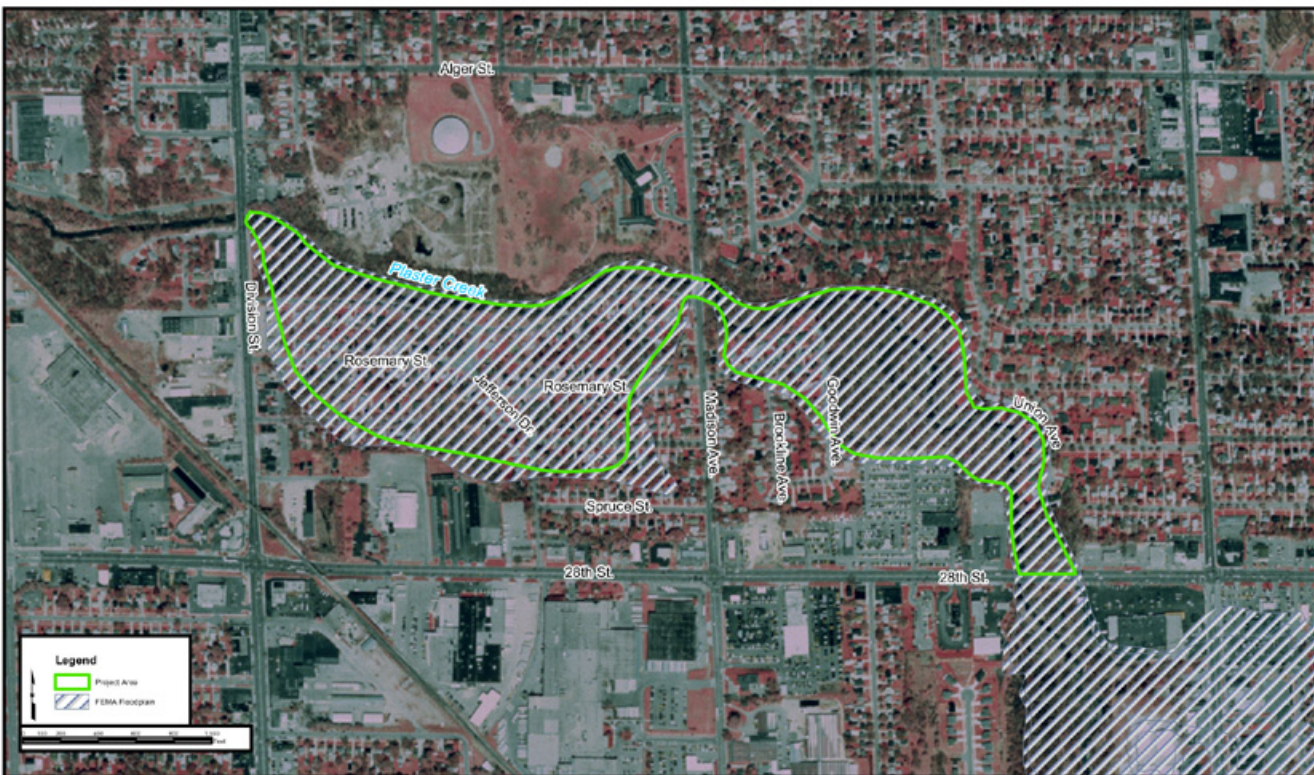


Figure 4. Existing 100 - Year Floodplain  
Plaster Creek Floodplain Mitigation

Prepared by:



OWANA, INC.





Figure 5. FIS Cross Section Locations  
Plaster Creek Floodplain Mitigation

Prepared by:



Client:







Figure 6. National Wetlands Inventory  
Plaster Creek Floodplain Mitigation

Prepared by:



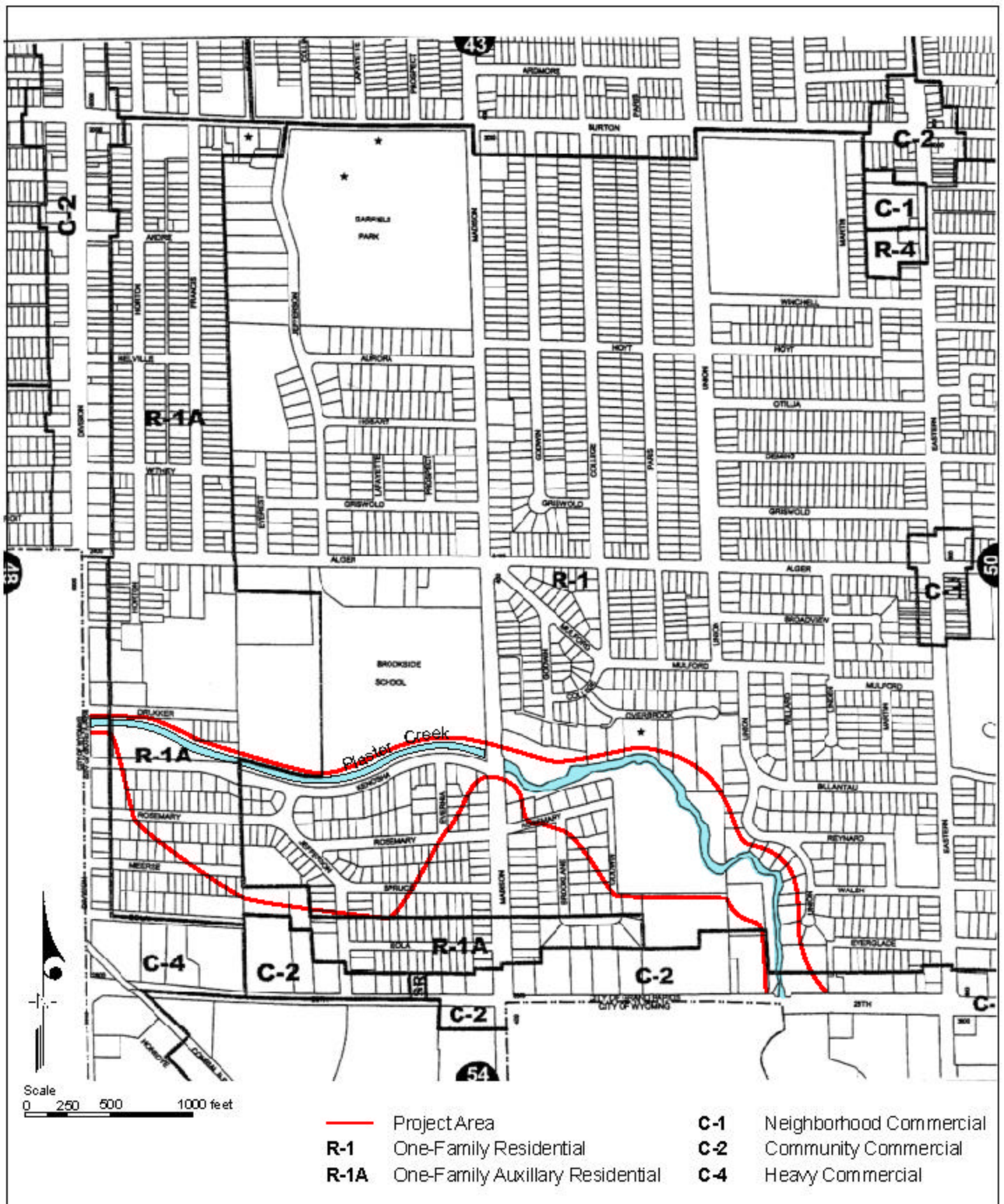


Figure 7. City of Grand Rapids  
Zoning Within Project Area









Figure 9. Photograph Locations  
Plaster Creek Floodplain Mitigation

Client:



Prepared by:







**Photograph 1:** Berm to be placed along treeline within city property. Plaster Creek is to the left and Kenosha Drive is to the right.



**Photograph 2:** Continuation of proposed berm location along treeline (eastward from photograph 1). A slight existing natural levee can be observed along the treeline.



**Photograph 3:** West View of homes along Kenosha Drive to be protected by berm placement.

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**Photograph 4:** East View of homes along Kenosha Drive to be protected by berm placement.



**Photograph 5:** Intersection of Kenosha Drive and Jefferson Drive where the proposed pump station is to be placed. Elevation of homes in the distance is considerably lower than the top of bank along the creek.



**Photograph 6:** Upstream view of Plaster Creek with Madison Avenue Bridge in the distance.





**Photograph 7:** East facing view of residents' backyards along Rosemary Street (east of Madison Avenue). Moss covered brick along the base of the home in the foreground indicates prior flooding event. Berm placement will be along the treeline in the left side of the photograph.



**Photograph 8:** View of woodlands to the east of Goodwin Avenue. This area will remain part of the 100-year floodplain of Plaster Creek.



**Photograph 9:** Backyard view of homes along the eastern bank of Plaster Creek within the eastern part of the project area. Owner financed floodwall can be viewed in the distance.



**Photograph 10:** View of existing excavated channel bisecting elbow of Plaster Creek in the eastern portion of the project area. Fallen debris and understory vegetation are proposed to be removed to prevent the formation of backpools behind the stream meanders.