US Army Corps of Engineers®
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Lexington Green P2#443918

Section 205 of the 1948 Flood Control Act
Flood Risk Management

Federal Interest Determination

Buffalo District
US Army Corps of Engineers
5/24/2016

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207-3199

REPLY TO
ATTENTION OF

CELRB-PM-PL

18 February 2016

MEMORANDUM FOR Commander, U.S. Army Division, Great Lakes and Ohio River, ATTN: CELRD-CM (Mr. Gary Mosteller), 550 Main Street RM 10524, Cincinnati, OH 45202-3222

SUBJECT: CAP Section 205, Buffalo Creek, Lexington Green, West Seneca, NY, Termination

1. The attached CAP Fact Sheet documents a negative federal interest in a flood risk management project at Buffalo Creek, Lexington Green, West Seneca, New York. The technical team has determined that there are not sufficient economic benefits to justify proceeding with a cost-shared feasibility study.

2. The fact sheet was reviewed by CELRB-PM-PA/Mr. Craig Forgette, P.E., PMP. It has been determined by Mr. Forgette that the recommended termination of the proposed project is technically correct and policy compliant.

3. I concur with this negative determination of federal interest and recommend termination of this CAP request and formal closeout of the project.

4. The point of contact for this subject is Lex Barker at (716) 879-4135 or lex.c.barker@usace.army.mil.

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Encl
CAP Fact Sheet

David Schulenberg
Chief, Planning Branch

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Executive Summary: The purpose of this Federal Interest Determination (FID) is to document the findings of an initial evaluation of potential flood risk management measures for the Lexington Green residential community located in West Seneca adjacent to Buffalo Creek, Erie County, New York. Based on the findings presented, it was determined that a Federal Interest does not exist in pursuing a flood risk management study at the proposed site.

1. Project: Buffalo Creek, Lexington Green, town of West Seneca, NY, Flood Risk Management: Section 205 of 1948 Flood Control Act. P2# 443918

2. Location of Project/Congressional District: The approximately 71residence community of Lexington Green is located on the south side of the Buffalo Creek in the town of West Seneca, Erie County, New York (Figure 1). The project lies in the Congressional District of Representatives Brian Higgins D-NY (26th District), Senator Charles Schumer D-NY, and Senator Kirsten Gillibrand D-NY.

Based on 2010 Census data, the town of West Seneca has approximately 44,711 residents. Per the American Household Survey, West Seneca has 2.36 individuals per household compared to 2.61 for New York State. Based on West Seneca's individuals per household rate, it is anticipated that approximately 189 individuals live in the area of study. The median household income is $56,762 compared to $58,003 for the State of New York. Per capita income is $28,002 and $32,382 for West Seneca and New York State, respectively.

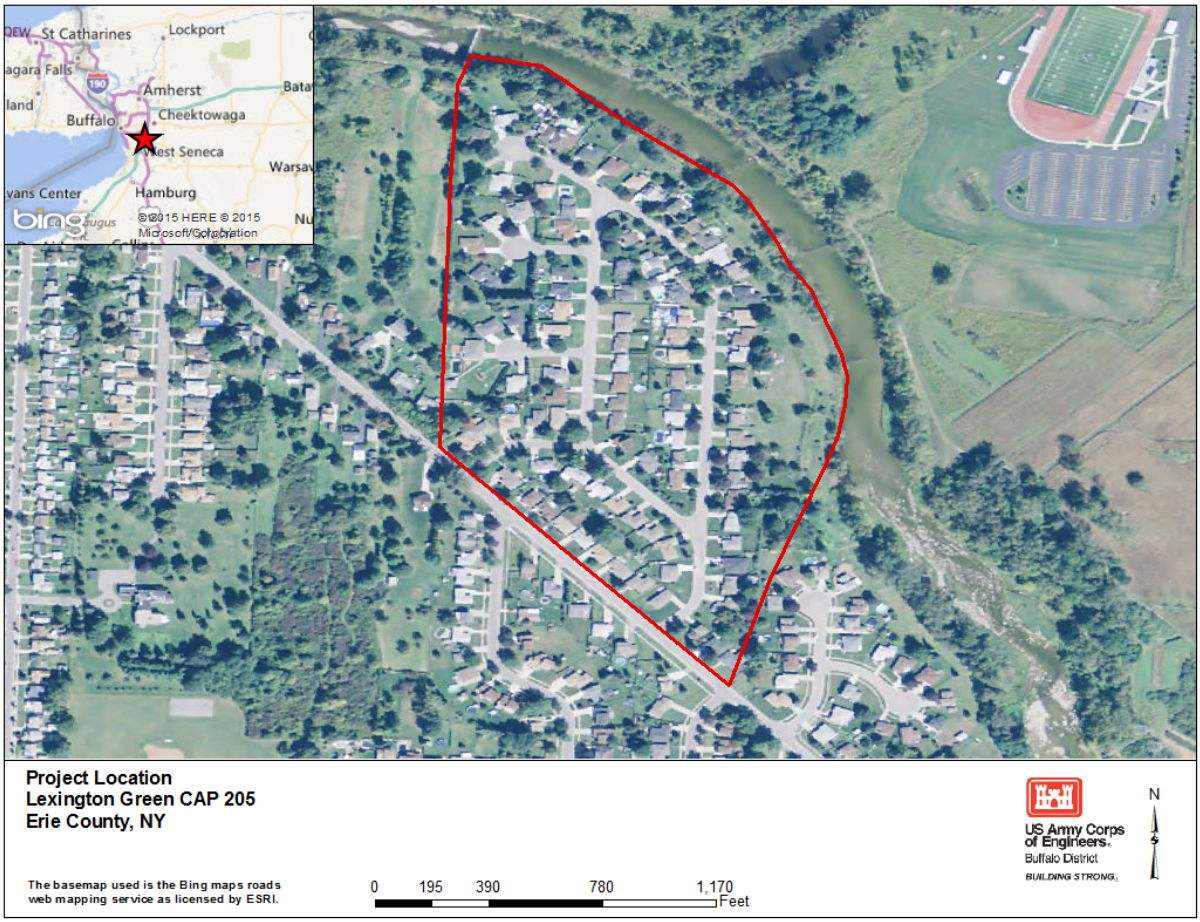

Figure 1: Location of Lexington Green outlined in red on the south side of Buffalo Creek.

3. Study Authority: Section 205 of the 1948 Flood Control Act, as amended, authorizes the Secretary of the Army, in cooperation with non-federal interests to provide for flood damage reduction measures to areas impacted by the damaging results of floods. Section 205 projects are part of the Continuing Authorities Program (CAP) of the U.S. Army Corps of Engineers (USACE), and are generally related to "smaller" scale solutions for a single community. Individual Section 205 projects are limited to $10,000,000 in total federal funds including all study, design, and construction costs.

Following construction, Section 205 projects are transferred to the non-federal sponsor for operations and maintenance at 100 percent non-federal expense. The first $100,000 of Section 205 feasibility study costs are at 100 percent federal expense. Feasibility study costs above $100,000 are shared 50 percent federal and 50 percent non-federal (either in cash or combination of both cash and work in kind). Design and Implementation (including construction) costs are shared 65 percent federal and 35 percent non-federal. Non-federal sponsors are responsible for 100 percent of the cost of Lands, Easements, Rights of Ways, Relocations and Disposal Areas (LERRDs). LERRDs costs can be used by non-federal sponsors to offset the 35 percent non-federal share of construction costs.

The non-Federal share for construction can be comprised of cash, in-kind services, and LERRDs with Section 205 projects; however, there is a 5 percent minimum cash contribution.

Consistency with Study Authority:

All conclusions in this fact sheet are consistent with the minimum requirements for Section 205 projects with regards to USACE flood damage reduction authority, minimum discharge, and drainage area. These requirements are outlined below in *Minimum Requirements for Section 205 Projects.*

The primary problem in this neighborhood is repeatedly flooded by Buffalo Creek, which is consistent with USACE flood damage reduction authority outlined in 33 CFR § 238.4 and ER-1165-2-21.

The flood discharge for Buffalo Creek for the ten percent flood as obtained from the 1992 Flood Insurance Study is 9,670 cubic feet per second (cfs), thus exceeding the 800-cfs minimum requirement. From this same Flood Insurance Study it indicates that the Buffalo Creek drainage area, upstream of the confluence with Cayuga Creek is approximately 146 square miles, which exceeds the minimum requirement for drainage areas.

Minimum Requirements for Section 205 Projects:

Title 33 C.F.R. Part 238, *Water Resources Policies and Authorities: Flood Damage Reduction Measures in Urban Areas* provides policies and guidance for USACE participation in urban flood damage reduction projects and establishes criteria to distinguish between improvements to be accomplished by USACE under its flood control authorities and storm sewer systems to be accomplished by local interests. The following definition applies to flood damage reduction projects:

> "Flood damage reduction works in urban areas are the adjustments in land use and the facilities (structural and non-structural) designed to reduce flood damages in urban areas from overflow or backwater due to major storms and snowmelt. They include structural and other engineering modifications to natural streams or to previously modified natural waterways. Flood damage reduction works are designed to modify flood behavior typified by temporary conditions of inundation of normally dry land from the overflow of rivers and streams or from abnormally high coastal waters due to severe storms (33 CFR § 238.4)." [ER-1165-2-21]

4. Study Purpose: The purpose of this FID is to determine if a Federal interest exists to make the federal investment of implementing a flood damage reduction project at the study area.

5. Discussion of Prior Studies, Reports and Existing Water Projects: Buffalo Creek in the t town of West Seneca has been the subject of several studies conducted by the USACE Buffalo District. Those reports include:

- Flood Plain Information Report for Buffalo Creek (USACE, 1966),

- Assessment of Streambank Erosion for Major Streams of the Buffalo District (USACE, 1977),
- Flood Plain Management Planning Assistance Report for Buffalo Creek after the penultimate flooding incident in the Lexington Green neighborhood (USACE, 1979),
- Multiple Flood Insurance Studies the last of which revised in 1992 (FEMA), and
- Earsing Sill Safety Study for the USDA Soil Conservation Service (USACE, 1992b).

A summary of these reports is provided below as well as an assessment of the current hydraulic conditions along Buffalo Creek based on these studies.

Buffalo Creek flows over shale bedrock for most of its length and its meanders have eroded shale bluffs which have been replaced by alluvial soils (USACE, 1977). The U.S. Soil Conservation Service (now the Natural Resources Conservation Service) implemented a sediment control project in the 1950s to address the potential contribution of sediment loads to the commercial navigation channels of the lower Buffalo River and Lake Erie (USACE, 1979). The project included straightening Buffalo Creek in the area of Lexington Green by removing a meander and cutting off an oxbow, as well as installing five "Earsing Sills" to impede sediment transport. The straightening of the stream was also considered a means to prevent ice jam flooding. The 1966 Flood Plain Information Study warns of the need for future flood control projects on Buffalo Creek if development in the largely undeveloped agricultural land is not controlled. However, the Lexington Green neighborhood was already developed by the time the report was released.

Development of the Lexington Green neighborhood started in the early to mid-1960s and sits atop the old channel, which was filled with gravel and excavated material from the channel straightening project (USACE, 1979). Figure 3 depicts the approximate old channel alignment from the 1979 report overlain on a current aerial image. The report indicates that the precipitation driven overbank flooding can occur at the 2 percent Annual Chance Exceedance (ACE - 50 year recurrence interval flow) and ice jam flooding can occur at much lower flows without significant rainfall during periods of ice and snow melt in the late winter to early spring. In addition to precipitation driven flooding and ice jam flooding; the old channels under the neighborhood are thought to have a high groundwater conductivity and connection to the existing creek, potentially providing for a significant flux of water from the creek to the groundwater beneath the neighborhood. These groundwater fluxes might contribute to the surcharging of the sanitary sewer and ponding on the subdivision roads over sanitary sewer manholes (USACE, 1979). The sewer outlet from the neighborhood has also been identified as a potential cause of flooding from malfunction or improper operation of the gate on the sewer outlet to Buffalo Creek.

Figure 2: Buffalo Creek Old Channel Alignment represented by dashed lines.

The Flood Plain Management Planning Assistance Report (USACE, 1979) provided a comprehensive look at the flooding issues after the 1979 flood and proposed six structural and non-structural alternatives to alleviate the flooding issues. Three alternatives (alternatives 4 through 6) had benefit cost ratios greater than one and are described below:

- Alternative 4 was a levee that protects up to the 200 year recurrence interval flow, with three feet of freeboard and an impermeable core to limit seepage or groundwater flow.

This alternative included other flood control features and had a benefit cost ratio of 1.10. The levee alternatives do create a catastrophic flooding situation if the levees fail or overtop such that the small area of the neighborhood could fill rapidly allowing little time for evacuation.

- Alternative 5 included the installation of a large capacity storm sewer lift station (1,000 gallons per minute [GPM]); a large collection chamber to be located in a low spot between residences at 77 and 89 Lexington Green; and flood proofing of the sanitary sewer manholes and storm sewer outlet mechanism. This alternative provides 50 year protection under free flow, 10 year protection for ice jam conditions, is the least costly option, and provides a benefit cost ratio of 1.72.
- Alternative 6 was essentially Alternative 5 with the addition of floodproofing for individual homes; 60 houses would be provided with block glass basement windows, sump pumps, and watertight basement bulkheads. The benefit cost ratio is 1.11 for Alternative 6 which provides 10 year protection.

The report concludes by stating that the levee alternative is the only plan that would warrant federal participation because of the relativity low level of protection provided by the pumping and floodproofing options. There was no documentation into why the proposed plan was not implemented.

The remaining USACE reports provide the most current hydrologic and hydraulic conditions of Buffalo Creek. The Earsing Sill Study focuses on the dangerous condition of a submerged hydraulic jump, which can form at low head dams (USACE, 1992b). Five modifications are suggested to eliminate or reduce submerged hydraulic jumps. One modification suggests reconnecting the old oxbow which would provide added storage capacity and reduce flooding. However, this oxbow is 50 percent wetlands and the environmental impacts could limit that option (Ecology and Environment Inc., 2010). The Flood Insurance Study is the most recent modeling effort in the area and generated the inundation map for the 1 percent ACE flood plain shown in Figure 3 (USACE, 1992a). The hydrology and hydraulics from each report are discussed in the following section.

Figure 3: FEMA 100 Year Flood Plain shown as shaded area. Lexington Green is located on the south side of the creek in the center of the aerial photograph.

6. Plan Formulation

A. Identified Problems

Existing Conditions:

The Lexington Green neighborhood sits along a bend in Buffalo Creek approximately 0.7 miles upstream of its confluence with Cayuga Creek at the Harlem Road Bridge. Buffalo Creek runs along the north and east sides of the neighborhood over a length of approximately 0.45 miles.

Historically, the area has been susceptible to flooding and, in particular, ice jam flooding in the late winter to early spring (USACE, 1966; USACE, 1979; USACE, 1992a). However, during the period from March 1979 to January 2014, the neighborhood did not experience any major flood events. The upstream portion of the neighborhood lies behind a levee that provides some protection.

In 2014 the neighborhood experienced two flood events within a six week span. The first event occurred on the 11th of January. The water level in Buffalo Creek rose rapidly, increasing by approximately 4.0 feet in 1.5 hours and approximately 4.5 feet in 2.5 hours. The water level exceeded the banks and flooded the low areas and roads first which caused water to backup into basements. As water levels rose damage was done to first floors as well. The second flood event occurred February 21, 2014. The water once again rose rapidly to reach major flood stage and receded rapidly as well; returning to below flood levels in approximately an hour.

Following the ice jam flood in 2014, local interests in the town of West Seneca constructed a temporary levee with recycled concrete downstream of the existing levee. Neither of the levees are accredited by the Federal Emergency Management Agency (FEMA), meaning flood insurance is still required for any structures residing inside the FEMA 1 percent Annual Chance Exceedance (ACE, previously referred to as the 100 year flood). As shown in Figure 3, the majority of the approximately 71 houses in the neighborhood are within the current FEMA 1 percent ACE. USACE Buffalo District has been requested to review the existing reports and data to determine the federal interest in possible flood management projects.

The hydrologic and hydraulic properties of the study area were determined from previous reports. The town of West Seneca was once a rural agricultural community but has since changed into a suburban area with the change of land use from agricultural to residential.
The climate of West Seneca is humid continental with average annual precipitation of 39.2 inches, average annual snowfall of 94.6 inches, and an average annual temperature of 48.2°F (NOAA, 2015). The coldest month is January with an average temperature of 24.6°F and the warmest month is July with an average temperature of 71.2°F.

A discharge-frequency relationship for Buffalo Creek at the USGS gaging station at Gardenville, NY (USGS gage 04214500, located approximately 1 mile upstream of the Lexington Green neighborhood) was developed in the 1992 Earsing Sills Safety Study following Bulletin 17B

guidance. Table 1 depicts the discharge-frequency relationship developed in the study and Figure 4 gives a graphical representation of the relationship.

Table 1: Discharge-Frequency Relationships (USACE, 1992b)

Annual Chance Exceedance (%)	Return Interval (years)	Computed Peak Discharge (cfs)	Expected Peak Discharge (cfs)
0.2	500	16,700	17,700
0.5	200	15,000	15,700
1.0	100	13,800	14,300
2.0	50	12,600	12,900
4.0	25	11,300	11,500
10.0	10	9,670	9,770
20.0	5	8,360	8,400
50.0	2	6,360	6,360
80.0	--	4,870	4,850
90.0	--	4,260	4,220
95.0	--	3,810	3,760
99.0	--	3,110	3,020

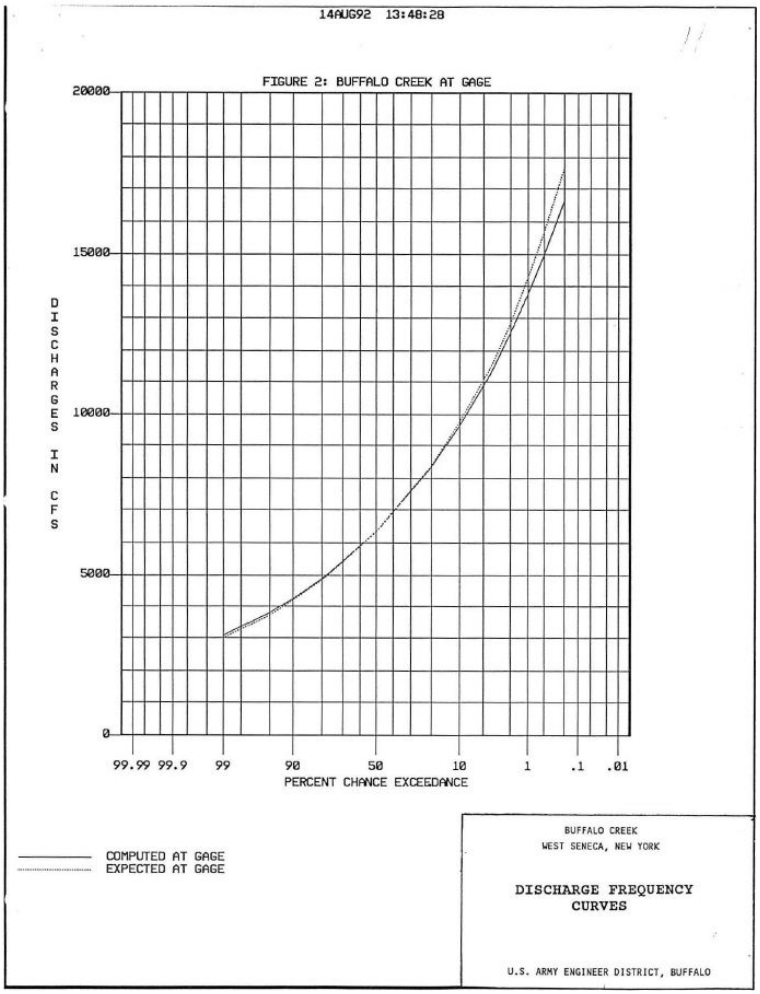

Figure 4: Discharge-Frequency Curves (USACE, 1992a)

While the Earsing Sills study lists a 1 percent ACE flow of 13,800 cfs, the Flood Insurance Study uses a 1 percent ACE flow of 16,000 cfs determined using regression equations and weighted to account for the increase in flow between Gardenville and the outlet of Buffalo Creek. The FIS flow is more conservative and will be the basis for this hydraulics and hydrology analysis. Using the stage-discharge graph from USACE (1979), shown in Figure 5, for the location corresponding with 67 Lexington Green (i.e. 260 feet upstream of the most upstream weir), a 1 percent ACE flood corresponds to a water surface elevation of 601.0 feet, with the National Geodetic Vertical Datum of 1929 (NGVD29) datum. The datum conversion from NGVD29 to NAVD88 is approximately -0.53 feet for the area, so the 1 percent ACE water surface elevation is 600.47 feet (NAVD88). The stage-discharge relationship from USACE (1979) was developed for ice conditions which provide a more conservative estimate and a higher level of protection than ice-free conditions.

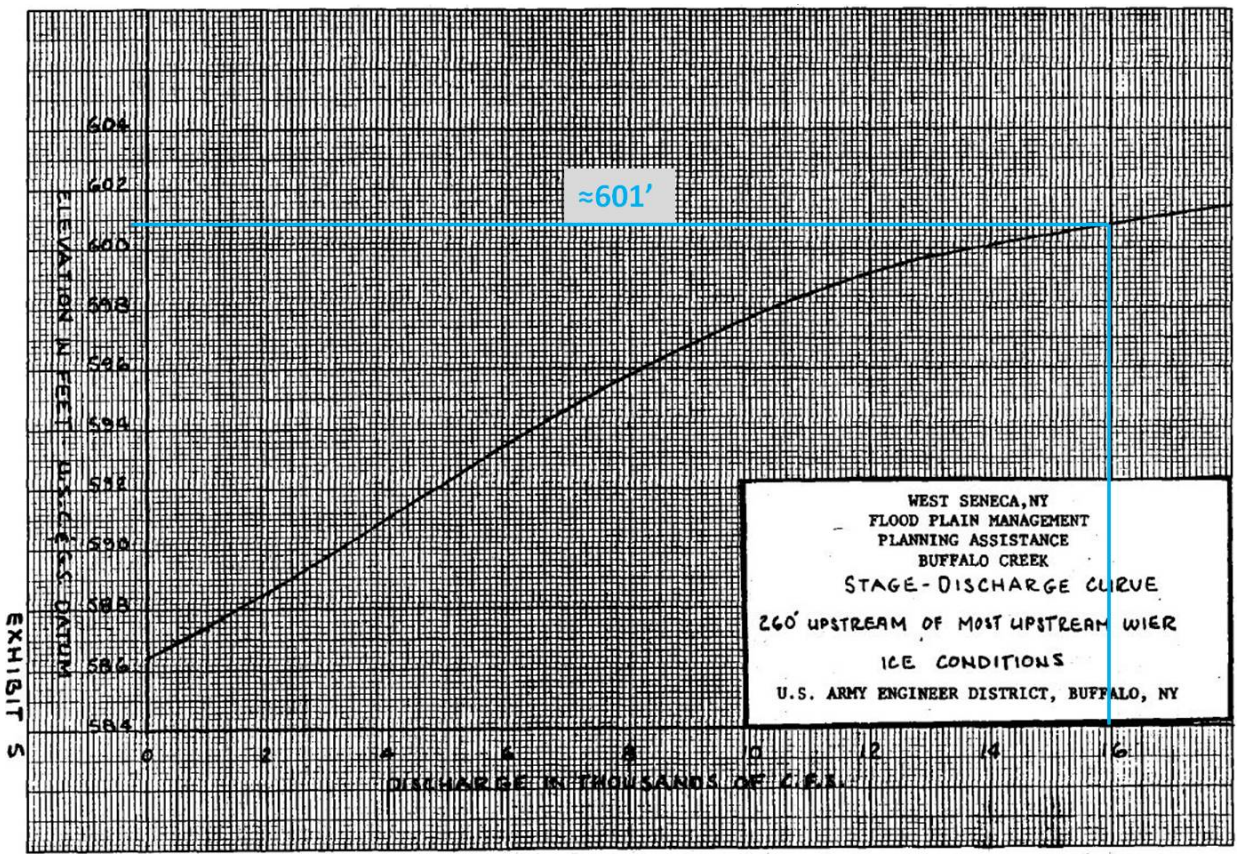

Figure 5: Stage Discharge Curve (USACE, 1979)

Expected Future Without Project Conditions:

Under the future without project condition it is anticipated the Lexington Green neighborhood will continue to incur damages and costs associated with further flooding events if a flood damage reduction project in the area is not instituted.

B. Planning Constraints & Planning Objectives:

Constraints:

1. Preferred plan must be economically feasible.
2. Plan must fit into a constrained geographic footprint.
3. Proposed flood risk management project must be compatible with the stream and riparian environment.
4. Plan must not adversely impact natural and existing flow regimes and water quality.

Objectives:

1. Reduce damage from ice jam flood events in the Lexington Green neighborhood.
2. Minimize adverse economic and social impacts in the impacted neighborhood.
3. Be widely accepted by the public.
4. Be compatible with existing and planned improvements in the area.
5. Measures must avoid and minimize adverse impacts to the aquatic and terrestrial environment to the maximum extent practicable.

Problems: The primary problem is ice jam flooding which inundates the low-lying areas of the Lexington Green neighborhood. Historically, the area has been susceptible to flooding and, in particular, ice jam flooding in the late winter to early spring. However, during the period from March 1979 to January 2014, the neighborhood did not experience any major flood events.

Opportunities: The primary opportunity is to provide an economically justified project that would significantly reduce the flood damages incurred by the town of West Seneca in the neighborhood surrounding Lexington Green during high flow events along Buffalo Creek.

C. Potential Project Measures*:* The following measures were developed with the intent of providing flood reduction in the Lexington Green area, with more detailed descriptions that follow:

- Levee
- Flood Bench
- Ice Control Structure

- Flood Early Warning System
- Ice Management

Measure 1: Levee

An option for a levee around the neighborhood was analyzed for different flood heights in the 1979 Flood Plain Management Planning Assistance Report (USACE, 1979). The layout of the potential levee is shown in Figure 6 and runs a length of approximately 3,325 feet. The levee cross section calls for a top width of 10 feet, with a 2.5H:1V side slope, and a top elevation of 603.5 feet (NAVD88) (approximately 9.5 feet tall).

Figure 6: Levee Layout from USACE (1979) with Approximate Ground Surface Elevations

Slight alterations were made to the 1979 layout including:

(1) Levee starts on the river side contour of 586.5 (NAVD88);

(2) Length shorted to 2,570 feet;

(3) Tied into high ground at the upstream and downstream ends; and

(4) Provides a 1 percent ACE level of protection with three feet of freeboard, the levee top elevation is 603.5 feet (NAVD88) on the upstream end.

The other levee details remain the same and as discussed in the previous report (USACE, 1979) the levee will take up much of the residents' backyards and includes the taking of pools and outbuildings (see Figure 7).

Figure 7: Measure 1 Levee Footprint

The levee would be approximately 71.5 feet wide with an estimated 10,300 cubic yards cut and 42,500 cubic yards of fill. Compaction and the possibility of using cut material as fill has not been accounted for at this point. The effects of the levee on the creek hydraulics are unknown; it is possible that by constructing a levee to this elevation the 100 year flood elevation at the Lexington Green Neighborhood would increase or flooding would be induced on the other side of the creek.

The proposed levee could be constructed in the footprint of a buried pipeline. If relocation of this pipeline is needed as part of construction, the costs for relocation would be considered as part of the Lands, Easements, Rights-of-Way, Relocations and Disposal (LERRDS) and would be factored into projects costs. According to USACE policy, utility relocations are 100% responsibility of the non-Federal sponsor and this cost would not be part of the project costs eligible for cost sharing.

The Rough Order Magnitude cost for this measure is $5,338,048.

Measure 2: Flood Bench

This measure is intended to increase the cross-sectional flow area for high flows by constructing a flood bench on the north side of the river (Figure 8). While reconnecting the oxbow, in the middle of the proposed bench site, is not envisioned for this measure, the oxbow area would have to be addressed as the flood bench would affect the hydrology of the oxbow and impact wetlands in the oxbow. The height of the flood bench would be set at 0.8 feet above the highest sill elevation, or 586.5 feet (NAVD88). It should be noted that this elevation is slightly below the critical flow elevation of the downstream-most Earsing Sill (see Table 2) and would affect the hydraulics of the sills. As such, the need for and function of the sills would need to be analyzed, including the possibility of worsening submerged hydraulic jumps conditions. The flood bench width is approximately 175 feet wide at the bottom, with a 3H:1V side slope where soil is excavated, and a total width of approximately 210 feet from toe to top of bank. The width of the bench was calculated with a simplistic Manning's Calculation using channel parameters from the Earsing Sill Study and including a 20 percent factor of safety. The actual width needed to provide the desired level of protection would have to be analyzed in more detail. The flood bench would widen at both the upstream and downstream ends to tie back into high ground as shown in Figure 8. The length of the flood bench is 3,060 feet with an estimated 219,000 cubic yards of cut and 1,000 cubic yards of fill.

The Rough Order Magnitude cost for this measure is $8,731,243.

Figure 8: Measure 2 Flood Bench (210 feet wide, 3,060 feet long)

Table 2: Earsing Sill Elevations

Sills	1	2	3	4	5
Station	34+60	38+60	42+70	46+00	50+00
Crest Elevation (NGVD29)	583.0	583.4	584.3	585.3	586.2
Crest Elevation (NAVD88)	582.5	582.9	583.8	584.8	585.7
Length, Feet	134.0	129.0	129.0	122.0	134.0
Elevation of Max Critical Flow (NAVD88)	585.7	583.6	584.9	586.3	586.8

Several issues would need to be addressed in a potential feasibility study, including:

(1) How much should the flood bench lower the water surface elevation, and for what design storm?

(2) Is a 210 foot flood bench sufficiently wide or too wide?

(3) Is 3,060 feet sufficiently long or too long?

(4) How should the top elevation change from upstream to downstream?

(5) How would the oxbow hydraulics and hydrology be affected?

Measure 3: Ice Control Structure

To construct an ice control structure there must be enough area to allow for flow around the control structure during ice conditions, as well as sufficient vertical height to allow for higher water levels upstream of the structure. At Lexington Green, there is insufficient flow area and insufficient vertical height to have a properly designed ice control structure. To consider an ice control structure it would have to include Measure 2, which calls for a flood bench on the bank opposite of the Lexington Green neighborhood. The flood bench would provide the increased flow area needed to accommodate flow around the ice control structure during an ice jam event. In addition to Measure 3, this measure would include inserting piers into the stream along the downstream most Earsing Sill. Due to ice blockage, more area may be required than that envisioned for Measure 2 and as depicted in Figure 8. The exact increase in cross sectional area needed for an ice control structure would need to be determined in a more extensive study.

The Rough Order cost for Measure 3 is $4,457,471, however; the cost for implementing this alternative would be the sum of Measures 2 and 3 (see Tables 13 and 14). The Rough Order Magnitude cost for this measure is $13,188,714.

Measure 4: Flood Early Warning Detection System

Non-structural measures attempt to avoid flood damages by modifying or removing properties currently located within flood prone areas. These measures do not affect the frequency or level of flooding within the floodplain; rather, they affect floodplain activities. In considering the range of non-structural measures, the community needs to assess the type of flooding which occurs (depth of water, velocity, duration) prior to determining which measure best suits its needs.

The Engineering Resources Branch of the Engineer Research and Development Center's Cold Regions Research and Engineering Laboratory (CRREL) has been involved in the development of environmental monitoring systems for remote sites, several of which have been modified for use in early flood warning. Flood early warning detection systems can be implemented which can provide communities with more advance warning of potential flood conditions. Early forecast and warning involves the determination of imminent flooding, implementation of a plan to warn the public, and organization of assistance in evacuation of persons and some personal property.

A typical low-cost early warning flood warning system consists of commercially available off-the-shelf-components. The major components of an early warning system are a sensor connected to a data acquisition device with built-in power supply or backup, some type of notification or warning equipment, and a means of communication. For ice jam warning systems, stage is generally monitored using a pressure transducer. The data acquisition system performs two functions: it collects and stores real-time flood stage data from the pressure transducer and initiates the notification process once predetermined flood stage conditions are met.

The system can be powered from an alternating current source via landline or by batteries that are recharged by solar panels. The notification process can incorporate standard telephone or cellular telephone. Transfer of data from the system can be achieved using standard or cellular telephone, radio frequency (RF) telemetry, wireless internet, or satellite transceivers. Emergency management notification techniques can be implemented through the use of radio, siren, individual notification, or a reverse 911 system. More elaborate means include remote sensors that detect water levels and automatically warn residents. These measures normally serve to reduce flood hazards to life and damage to portable personal property. A typical system configuration is provided in Figure 9**.**

The Rough Order Magnitude cost for this measure is $107,429.

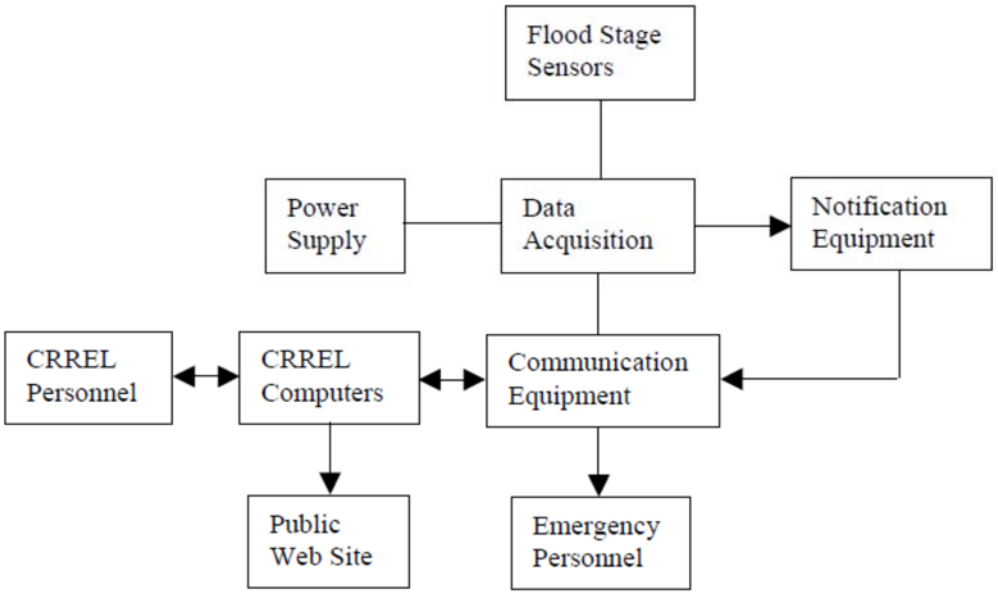

Figure 9: Simple early warning flood stage system tested at CRREL

Various configurations can be used to monitor conditions of flood stage. These could include the rate of rise in a 24-hour period and overbank flood stage, since both events can signify the potential for flooding that occurs as the result of an ice jam. The system could also include water temperature measurements, which could be used to signal frazil ice production and the start of freeze up jamming. Standard and low-light cameras could also add to remote monitoring capability by incorporating a public Web interface to allow emergency response personnel to visually inspect the status of the river at any time from any computer with internet access. The system could use landline power and notification via standard telephone to any combination of residents, municipal officials, the fire department or county emergency services using a prerecorded message.

Measure 5: Ice Management

For this Measure, the Buffalo District would prepare a tech transfer manual for the town of West Seneca and Erie County on various ice management measures. Measures would include various methods of preventing ice jams by ice cutting. The manual would include detailed descriptions of various ice cutting patterns and techniques, as well as various equipment options and personnel requirements. An assessment of the relative success rate of the various techniques would be provided as available in the Ice Engineering literature. Suggested locations for ice cutting operations would be provided based on expected effectiveness and site accessibility. Criteria and scheduling would be provided for determining environmental conditions (e.g. temperature, ice thickness, weather forecast) when ice cutting operations should start and under what conditions they are no longer necessary. While targeted to the Lexington Green area of Buffalo Creek, the manual, where feasible, would identify where the methods were more broadly applicable to other area creeks which experience ice jam floods. While this measure could not be performed

under the CAP 205 authority, it could potentially be implemented using the Planning Assistance to States (Section 22) authority.

D. Preliminary Evaluation of Alternatives:

Methodology:

In order for USACE to consider the implementation of a project in the Lexington Green area of West Seneca, must first conduct an economic evaluation to determine if the expected average annual benefits of the project exceed the expected average annual costs. The benefits associated with a Flood Risk Management (FRM) study typically consist of reductions in damages to commercial, industrial and residential structures, as well as reductions in other flood costs such as clean-up costs, detour costs, and overtime costs for town employees. These cost reductions are then compared to the costs of the project averaged over a 50-year period at the current federal discount rate (3.125%). If the total value of the average annual benefits exceeds the average annual costs, it is determined that there is a Federal interest in pursuing a FRM study.

Recent Flood History:

On January 11, 2014 the town of West Seneca experienced a flood event in the majority of the Lexington Green community due to a backup of ice on Buffalo Creek. Numerous residential structures were damaged. It has been estimated that between 55-70 homes experienced losses. The flood level was within the area considered ta.

A second flood event occurred on February 21, 2014 again as a result of ice jam flooding and results in water backing up into the locations sewer lines inundating the system. This event was quickly contained by town action and no notable damage was sustained by local residents. After the second event, the town stepped in and placed a temporary sand bag wall along Buffalo Creek. Additionally, during the summer, the town initiated a cleanup of the creek of impediments and debris to improve water flow.

The State of New York pledged $500K in public assistance to the town of West Seneca as a result of the 2014 floods. The money was purposed only for use on a capital project associated with the flood and as a result was never distributed. A disaster declaration was not issued since damages did not reach the threshold required. This prevented the town from receiving the pledged funds and prohibited local residents from pursuing FEMA or emergency relief funds.

Flood Damages: Upon USACE initiating the Federal Interest Determination (FID) study in the Lexington Green area, the town provided detailed information on the damages and costs associated with recent flooding events. The town provided damage reports which indicated damages to property and local infrastructure, as well as the costs for clean-up and emergency operations. These reports indicate the town incurred significant flood damages as a result of the 2014 flooding events at Buffalo Creek.

The town surveyed Lexington Green residents and requested them to document their respective property damage and loss.

Annual expected damages without project conditions: While theTtown provided detailed information on the 2014 flood event; information on prvious events is not available. . Additionally, it is difficult to quantify the likelihood of a similar event as these events were based on ice jam floods and not typical stream overtopping as a result of hydrological event. No new H&H information was provided for this Federal Interest Determination.

For this analysis, parcel data was derived for Google Earth Pro and compared against the National Flood Insurance Program Flood Insurance Rate Map. This map correlates to a 1 percent historical event. A total of 71 parcels were deemed to fall within the 1 percent Annual Chance Exceedance (ACE). All the properties were residential in nature. Data is provided in Table 3.

Table 3: 1% Annual Chance Exceedance Parcel Inventory Summary

1% Annual Chance Exceedance			
Parcel Inventory			
Type	**Structures**	**Total Assessed Value**	**Avg. Assessed Value**
Residential	71	$ 9,264,000	$ 130,479
Non-Residential	0	$ -	$ -
Total:	**71**	**$ 9,264,000**	**$ 130,479**

Residential damage surveys were taken after the recent flood event by representatives of the town of West Seneca. The compiled damage estimates were from 71 residences in the subject area. The town of West Seneca also provided receipts for damage costs associated with the 2014 flood incidents. The cumulative totals are presented in Table 4.

Table 4: Total 2014 Flood Event Costs

2014 Flood Costs					
Costs	**Structures Damaged**	**Total Property Damage**	**Average Property Damage**	**Employee hours/lost time/overtime**	**Total Cost**
Residential	59	$ 792,550	$ 13,433	$ 40,580	$ 833,130
town	-	$ -	$ -	$ 322,175	$ 322,175
Total:	**59**	**$ 792,550**	**$ 13,433**	**$ 362,755**	**$ 1,155,305**

Residential damage surveys were taken soon after the flood event occurred. As a result several households indicated that the costs were estimated damages up to that point in time and that the end damage cost associated with the flood event may end up being even higher then what they indicated. It is also likely that some households experienced costs that they determined to be negligible at the time or in terms of this survey and did not report, such as holiday decorations, stored possessions, etc. It is also likely that some households over reported damage in the hopes of receiving some form of governmental assistance.

The residential damage surveys had 4 households that reported damage in the excess of $50,000 with the highest reported damage being $85,000. Of the 59 households that reported damage, 42 reported $10,000 or less in damage.

Damage was contained to four streets as seen in Table 5:

Table 5: Summary by Location of Surveyed Residential Damage

Street	Number of Homes	Total Damage	Average Damage
Brian Lane	9	$ 91,500	$ 10,167
Frank Court	4	$ 28,200	$ 7,050
Gregory Drive	15	$ 401,000	$ 26,733
Lexington Green	31	$ 271,850	$ 8,769
	59	**$ 792,550**	**$ 13,433**

The households that reported the highest damages were those located in between Lexington Green and Gregory Drive which sit in a low lying area that used to be the old creek path.

Repairing and replacing drywall, carpets, furnaces and appliances were the leading cause of damage. The households with the highest reported damage indicated foundation and automobile damage in addition. Some individuals had finished basements which led to considerable furniture damage. Limited damages can be claimed from damages related to flooding in basements. Given the uncertainty surrounding the unknown content curve of the homes, all of the surveyed damages were included in an effort to be conservative. It should be noted that if a positive Benefit Cost (BC) ratio were achieved, finished basement furniture, household goods, carpeting, etc., would be excluded from the benefit analysis. Only a handful of homes reported damage outside of their basements which could indicate a positive bias to benefits.

Unreported in the survey was time and income lost because of the flood incident. An assumption was made that each household needed to take time off to take repair associated flood damage. Because of the severity of the event and the difficulties in scheduling non-business hour appointments, it was assumed that the household would need 3 days away from work to perform clean-up, meet with contractors, electricians, etc, in the effort to repair the property. The value of Lost Residential Income is assumed to be equal to the formula:

- **Lost Residential Income Value** = Number of impacted households * Number of days off * (Median West Seneca Household Income (Inflation Adjusted) / Annual Days Working)

This formula when converted to numeric values is:

- $ 40,580 = 59 * 3 * (($ 56,762 * 1.054) / 261)

Here the number of households is the number of homes that reported damage. The median West Seneca Household Income, $56,762, is based on the 2010 census. A wage inflation factor based on the Bureau of Labor Statistics' Employee Cost Index's Wage and Salary Component from 2010-2013 (2010 was used as the base year) was utilized for the inflation adjustment. The index was based on the national level.

town costs are based on receipts provided by the town that were directly related to the 2014 flood event. These include overtime, concrete work, fuel, sand, construction, gasoline, etc. A breakdown of specific expenses is shown in Table 6.

Table 6: town of West Seneca Costs

2014 Storm Overview and Financial Summary			
Expense	**Date**		**Cost**
Code Enforement Office	1/11/2014	$	1,160.00
WS Disaster Office	1/11/2014	$	1,233.99
Overtime Labor (J.Gullo)	1/11/2014	$	5,962.50
Labor/Overtime	1/11,12,13/2014	$	110,000.00
Sand	1/11,12,13/2014	$	832.00
Fuel	1/11,12,13/2014	$	9,500.00
Water Damage Vehicles	1/11,12,13/2014	$	1,550.00
Shanor Electric	1/30/2014	$	167.60
Union Concrete	2/12/2014	$	44,520.00
Peerless Inc.	2/25/2014	$	813.42
DRIPS, LLC	2/26/2014	$	82,795.77
Xylem (DBA Godwin)	3/10/2014	$	6,183.00
K&R Day Trucking	3/31/2014	$	6,857.50
Gasoline	1/1/2014	$	4,614.41
Overtime - Sewer Dept	1/11,12,13/2014	$	22,500.00
Overtime - Eng. Dept	1/11,12,13/2014	$	911.84
Town of Niagara	3/24/2014	$	1,144.68
Edbauer Construction	3/6/2014	$	21,048.02
Porta Potty Rental	1/12/2014	$	380.00
Total		**$**	**322,174.73**

There were no commercial properties within the study area. This is anticipated in the without project conditions going forward.

Given that the study area is within a small suburban development with no pass through access to measure thoroughfares, no traffic delays or detour costs were measured.

The 2014 flood event mirrored the National Flood Insurance Program Flood Insurance Rate Map 1 percent flood plain. As a result, the costs from this storm, as noted by residential surveys, lost residential income value and government receipts, are anticipated to be the 1 percent without project conditions ACE. This total value of damages is shown in Table 7.

Table 7: Without Project Conditions 1% Flood Event

Without Project Conditions 1% Flood Event:				
Costs	Structures Damaged	Total Property Damage	Labor / Lost Time / Town Costs	Total Cost
Residential	59	$ 792,550	$ 40,580	$ 833,130
Village	0	$ -	$ 322,175	$ 322,175
Total:	**59**	**$ 792,550**	**$ 362,755**	**$ 1,155,305**

Damages for differing flood event levels were then measured as a percentage of the 1 percent ACE. The weightings are shown in Table 8.

Table 8: Percentage Weighting for Specific Flood Levels

Exceedance Percentage	Weighting Percentage
10.00%	0%
5.00%	0%
4.00%	10%
2.50%	35%
2.00%	65%
1.50%	85%
1.00%	100%
0.75%	110%
0.40%	120%
0.20%	130%
0.10%	140%

The 10 percent ACE was measured as $0. Historically, there have been limited flood events on an annual, bi-annual or decade basis. Before 2014, the most recent flood event was in 1979. As a result, the 10 percent level appears to be fair assumption.

All values related to 5 percent or greater flood events were assumed to have damages avoided of $0. This is in line with the past 35 years of historical evidence that shows little to no flood damage. This assumption was made in an effort to prevent inflating benefits for the more frequent flooding events which may occur if damages avoided were forecasted based upon a linear interpolation of the known damages of the 10-year flood event.

Beginning at the 4 percent flood level damages were assumed to begin occurring. Damages according to percentage exceedance levels were assumed to move rapidly towards the 1 percent flood level. This is based on the fact that the neighborhood sits in a low lying area that used to be the old stream path and once the existing bank has crested the water will flow down into the residential neighborhood and pool in household's basements.

After reaching the 1 percent exceedance level, the anticipated damages of greater flood events were assumed to be on a linear path at 10 percent per level. This is due to the limited infrastructure available for damage. As noted there are only 71 homes in the subject area. Appraised value for all the homes in the studied flood zone is $9,264,000.

Tabular results of this analysis are depicted in Table 9 below:

Table 9: Average Annual Residential Damages and Costs Avoided

Residential Damages and Costs Avoided					
Recurrence Interval (yrs)	**Occurrence**	**Factor**	**Damages ($)**	**Weighted Damages**	**Cumulative Damages**
1.01	99.00		$ -	$ -	$ -
2.0	50.00	0.0625	$ -	$ -	$ -
4.0	25.00	0.0250	$ -	$ -	$ -
4.4	22.50	0.0250	$ -	$ -	$ -
5.0	20.00	0.0250	$ -	$ -	$ -
5.7	17.50	0.0250	$ -	$ -	$ -
6.7	15.00	0.0250	$ -	$ -	$ -
8.0	12.50	0.0250	$ -	$ -	$ -
10	10.00	0.0250	$ -	$ -	$ -
13	7.50	0.0250	$ -	$ -	$ -
20	5.00	0.0175	$ -	$ -	$ -
25	4.00	0.0125	$ 115,531	$ 1,444	$ 1,444
40	2.50	0.0100	$ 404,357	$ 4,044	$ 5,488
50	2.00	0.0050	$ 750,948	$ 3,755	$ 9,242
67	1.50	0.0050	$ 982,009	$ 4,910	$ 14,152
100	1.00	0.0038	$ 1,155,305	$ 4,332	$ 18,485
133	0.75	0.0030	$ 1,270,836	$ 3,813	$ 22,297
250	0.40	0.0028	$ 1,386,366	$ 3,813	$ 26,110
500	0.20	0.0015	$ 1,501,897	$ 2,253	$ 28,363
1000	0.10	0.0010	$ 1,617,427	$ 1,617	$ 29,980
			AA Benefits	**$ 29,980**	

Average Annual Benefits: $30,000

Average annual benefits are measured to be $30,000. If weighting greater than a 10 percent linear growth rate were utilized for events lesser than a 1 percent exceedance level (represented in the table by occurrence) the average annual benefits could be pushed to $35,000 though the potential additional benefits are too limited to matter in terms of proposed alternative average annual costs (see below). Additionally, the measured 1 percent ACE flood damages potentially includes finished basement costs which has previously been noted as a potential positive bias to damages.

Recent flood events in the study area have been caused by ice jam flooding and not by hydrological flow. This has led to the possibility of a higher prevalence for flood events that mimic the 1 percent flood level due to uncertainty surrounding ice jam flooding. Because of the uncertainty associated with ice jam flooding, a ‘Stressed Conservative’

assumption was developed. The ‘Stressed Conservative’ without project condition assumes that the 2014 flood event was more representative of a 2 percent event.

As a result of the assumption that the 2014 flood damages are representative of a 2 percent event a weighting was built around that level based on the percentages shown in Table 10.

Table 10: Percentage Weighting for Stressed Conservative Specific Flood Levels

Exceedance Percentage	Weighting Percentage
10.00%	0%
5.00%	0%
4.00%	20%
2.50%	75%
2.00%	100%
1.50%	150%
1.00%	200%
0.75%	225%
0.40%	250%
0.20%	275%
0.10%	300%

The weighting in the ‘Stressed Conservative’ continues to maintain the assumption that there is limited flood damage prior to the 4 percent exceedance level. Again the weightings move quickly to the 2014 damage level which is here considered to be the 2 percent exceedance level. After reaching the 2 percent level, damages continue to increase at a considerable rate as first floor flooding is assumed until the 1 percent level. At the 1 percent level damages are assumed to be double those noted in the 2014 flood. Following the 1 percent level, damages increase at a 25 percent linear rate.

The ‘Stressed Conservative’ average annual damages are represented in Table 11.

Table 11: Stressed Conservative Average Annual Residential Damages and Costs Avoided

Residential Damages and Costs Avoided					
Recurrence Interval (yrs)	**Occurrence**	**Factor**	**Damages ($)**	**Weighted Damages**	**Cumulative Damages**
1.01	99.00		$ -	$ -	$ -
2.0	50.00	0.0625	$ -	$ -	$ -
4.0	25.00	0.0250	$ -	$ -	$ -
4.4	22.50	0.0250	$ -	$ -	$ -
5.0	20.00	0.0250	$ -	$ -	$ -
5.7	17.50	0.0250	$ -	$ -	$ -
6.7	15.00	0.0250	$ -	$ -	$ -
8.0	12.50	0.0250	$ -	$ -	$ -
10	10.00	0.0250	$ -	$ -	$ -
13	7.50	0.0250	$ -	$ -	$ -
20	5.00	0.0175	$ -	$ -	$ -
25	4.00	0.0125	$ 231,061	$ 2,888	$ 2,888
40	2.50	0.0100	$ 866,479	$ 8,665	$ 11,553
50	2.00	0.0050	$ 1,155,305	$ 5,777	$ 17,330
67	1.50	0.0050	$ 1,732,958	$ 8,665	$ 25,994
100	1.00	0.0038	$ 2,310,610	$ 8,665	$ 34,659
133	0.75	0.0030	$ 2,599,436	$ 7,798	$ 42,457
250	0.40	0.0028	$ 2,888,263	$ 7,943	$ 50,400
500	0.20	0.0015	$ 3,177,089	$ 4,766	$ 55,166
1000	0.10	0.0010	$ 3,465,915	$ 3,466	$ 58,632
			AA Benefits	**$ 58,632**	

Stressed Conservative Variable Average Annual Benefits: $59,000

In this scenario it is assumed that the 2014 flood represented a 2 percent exceedance level. The 1 percent level was assumed to be 2x the 2 percent exceedance damage level. The damage curve was then assumed to follow a decaying growth function where each level equated to lower marginal damage than the prior level when seen through the prism of recurrence interval.

It should be noted that the damages associated with the 0.1 percent level would be equivalent to 37 percent of the total full market assessed value of all the homes in the subject area.

As noted this measurement is conservative given the information provided by the town and homeowners as well as referencing FEMA and USACE historical reports.

Cost Estimation:

Three structural measures were considered:

Measure No. 1 – Levee Construction
Measure No. 2 – Flood Bench
Measure No. 3 – Flood Bench with Ice Control Structure

Table 12: Measure No. 1: Levee Construction

Item No.	Description	Quantity	Unit of Measure	Estimated Unit Cost	Item Total
1	Mobilization & Prep. Work	1	Job	$ 110,500	$ 110,500
2	Erosion and Sediment Control				
	Silt Fence	2,570	LF	$ 10	$ 25,700
	Rock Entrance Ramp	89	CY	$ 50	$ 4,450
3	Clearing & Grubbing	5.2	Acre	$ 3,000	$ 15,600
4	Temporary Water Bypass				
	Earthwork / ditching	2,000	LF	$ 10	$ 20,000
	Bypass pumping (stand-by)	60	Day	$ 300	$ 18,000
	Bypass pumping (operational)	30	Day	$ 875	$ 26,250
5	Internal Drainage				
	24" HDPE Pipe	400	LF	$ 150	$ 60,000
	Concrete Headwall w/ flapgate	4	Ea	$ 15,000	$ 60,000
	4' Dia. Manhole	2	Ea	$ 7,500	$ 15,000
6	Excavation & Disposal	10,291	CY	$ 20.00	$ 205,820
7	Levee Fill	42,492	CY	$ 50.00	$ 2,124,600
8	Top Soil (4")	3,236	CY	$ 50.00	$ 161,800
9	Seeding	5.2	Acre	$ 5,000.00	$ 26,000
10	Demobilization	1	Job	$ 55,250	$ 55,250
				Item Subtotal	$ 2,928,970
				Contingency (35%)	$ 1,025,140
				Construction Subtotal	$ 3,954,110
				Lands and damages (10%)	$ 395,411
				Planning & Engineering (10%)	$ 395,411
				Construction Management (15%)	$ 593,116
				TOTAL PROJECT COST	**$ 5,338,048**

Table 13: Measure No. 2: Bench Excavation

Item No.	Description	Quantity	Unit of Measure	Estimated Unit Cost	Item Total
1	Mobilization & Prep. Work	1	Job	$ 192,800	$ 192,800
2	Erosion and Sediment Control				
	Silt Fence	3,100	LF	$ 10	$ 31,000
	Rock Entrance Ramp	89	CY	$ 50	$ 4,450
3	Clearing & Grubbing	14	Acre	$ 3,000	$ 42,600
4	Excavation & Disposal	218,415	CY	$ 20.00	$ 4,368,300
5	Fill (General)	1,019	CY	$ 15.00	$ 15,285
6	Top Soil (4")	11,482	CY	$ 25.00	$ 287,050
7	Seeding	14	Acre	$ 5,000.00	$ 71,000
8	Demobilization	1	Job	$ 96,400	$ 96,400
				Item Subtotal	$ 5,108,885
				Contingency (35%)	$ 1,788,110
				Construction Subtotal	$ 6,896,995
				Lands and damages (See Note 8)	$ 110,000
				Planning & Engineering (10%)	$ 689,699
				Construction Management (15%)	$ 1,034,549
				TOTAL PROJECT COST	**$ 8,731,243**

Table 14: Measure No. 3: Ice Control Structure Construction

Item No.	Description	Quantity	Unit of Measure	Estimated Unit Cost	Item Total
Flood Bench					
1	Mobilization & Prep. Work	1	Job	$ 192,800	$ 192,800
2	Erosion and Sediment Control				
	Silt Fence	3,100	LF	$ 10	$ 31,000
	Rock Entrance Ramp	89	CY	$ 50	$ 4,450
3	Clearing & Grubbing	14	Acre	$ 3,000	$ 42,600
4	Excavation & Disposal	218,415	CY	$ 20.00	$ 4,368,300
5	Fill (General)	1,019	CY	$ 15.00	$ 15,285
6	Top Soil (4")	11,482	CY	$ 25.00	$ 287,050
7	Seeding	14	Acre	$ 5,000.00	$ 71,000
8	Demobilization	1	Job	$ 96,400	$ 96,400
Ice Control Structure					
1	Ice Control Structure	1	Job	$ 2,445,800	$ 2,445,800
				Item Subtotal	$ 7,554,685
				Contingency (35%)	$ 2,644,140
				Construction Subtotal	$ 10,198,825
				Lands and damages (See Note 9)	$ 440,183
				Planning & Engineering (10%)	$ 1,019,882
				Construction Management (15%)	$ 1,529,824
				TOTAL PROJECT COST	**$ 13,188,714**

Measure No. 3 is dependent on the implementation of the flood bench (Measure No. 2). Table 14 shows the combined costs. Excluding flood bench costs, the total project cost of the ice control structure is $4,457,471.

One non-structural measures was considered:

Measure No.4 – Flood Warning System.

Table 15: Measure No.4 – Flood Warning System.

Item No.	Description	Quantity	Unit of Measure	Estimated Unit Cost	Item Total
1	Flood Warning System	1	Job	$ 55,100	$ 55,100
				Item Subtotal	$ 55,100
				Contingency (35%)	$ 19,285
				Construction Subtotal	$ 74,385
				Lands and damages (10%)	$ 7,439
				Planning & Engineering (10%)	$ 7,439
				Construction Management (15%)	$ 11,158
				Escalation Factor (6.98%)	$ 7,009
				TOTAL PROJECT COST	**$ 107,429**

Notes: To all cost estimates
1) These are Rough Order Magniitude (ROM) estimates based on parametric unit costs based on historical bid data.
2) The Current Working Estimate (CWE) assumes all work will be self-performed by a single Contractor.
3) Mobilization is estimated as 4% of construction costs and demobilization as 2% of construction costs.
4) CWE includes 35% contingency, this is rough order/parametric estimate of construction costs.
5) Levee fill is assumed clay material trucked in, shaped and compacted.
6) Generall fill in Measure 2 is assumed to be material that was excavated from the area. No material or trucking costs assumed in this item.
7) Topsoil in Measure 2 is assumed to be material that was excavated from the area and stockpiled on-site. No material or trucking costs assumed in this item.
8) Informal IVE provided by LRE-RE is $80,826. Adding 35% contingency = $109,115; Say $110,000.
9) Includes Note 8 plus 10% of Ice Control Structure costs.
10) Measure No. 4 costs were from the 2012 Fort Covington DFI report.
11) Measure No. 4 was escalated to current costs. In 2012 Escalation Factor was 691.50, in 2016 it is 800.62, FY2016 (800.62)/FY2012 (748.37)= 6.98%

Benefit Cost Analysis:

To meet requirements for a positive Federal Interest Determination, a project needs to have a Benefit Cost (BC) ratio in excess of 1.0. This is determined by comparing the average annual (AA) benefits to average annual costs.

For the three measures it is assumed that all flood damage would be fully mitigated. As a result average annual benefits are $30,000 and $59,000 under the normal and stressed conservative (SC) assumptions, respectively.

Three structural measures were considered:

Measure No. 1 – Levee Construction
Measure No. 2 – Flood Bench
Measure No. 3 – Flood Bench with Ice Control Structure

Table 16: Measure No. 1 Average Annual Costs

Measure No. 1 - Levee			
			3.125%
			Dec-15 Prices
Total First Costs			
Contractors Earning Plus Continencies		$	3,954,110
Engineering And Design	10%	$	395,411
Supervision & Administration	15%	$	593,116
Lands, Easements, Rights Of Way, Relocations & Disposal Costs	10%	$	395,411

Total First Costs		**$**	**5,338,048**
Investment Costs			
Total First Costs		$	5,338,048
Interest During Construction (1)		$	70,400

Investment Costs		**$**	**5,408,448**
Average Annual Costs			
Investment Costs		$	5,408,448
Partial Payment Factor (2)			0.0397930
Average Annual Costs		$	215,200
Annual Maintenance (3)	0.5%	$	19,800

Total Average Annual Costs		**$**	**235,000**
(1) Interest during construction assumed a straight line utilization of first cost requirements with the remainder of funds being utilized against a 12 month construction schedule at 3.125% annual interest rate			
(2) PP Fctr based on 50 yr project life and a 3.125% annual interest rate			
(3) Annual Maintenance taken as 0.5% of contractors earnings plus contingencies			

This cursory analysis yields the following BC Ratios:

Table 17: Measure No. 1 Benefit Cost Ratios

	Normal AA Benefits	SC' AA Benefits
AA Benefits	$ 30,000	$ 59,000
AA Costs	$ 235,000	$ 235,000
BC Ratio	**0.13**	**0.25**

Measure No. 2 average annual costs are shown below.

Table 18: Measure No. 2 Average Annual Costs

Measure No. 2 - Flood Bench			
			3.125%
			Dec-15 Prices
Total First Costs			
Contractors Earning Plus Continencies		$	6,896,995
Engineering And Design	10%	$	689,699
Supervision & Administration	15%	$	1,034,549
Lands, Easements, Rights Of Way, Relocations & Disposal Costs	10%	$	110,000

Total First Costs		**$**	**8,731,243**
Investment Costs			
Total First Costs		$	8,731,243
Interest During Construction (1)		$	122,800

Investment Costs		**$**	**8,854,043**
Average Annual Costs			
Investment Costs		$	8,854,043
Partial Payment Factor (2)			0.0397930
Average Annual Costs		$	352,300
Annual Maintenance (3)	0.5%	$	34,500

Total Average Annual Costs		**$**	**386,800**
(1) Interest during construction assumed a straight line utilization of first cost requirements with the remainder of funds being utilized against a 12 month construction schedule at 3.125% annual interest rate			
(2) PP Fctr based on 50 yr project life and a 3.125% annual interest rate			
(3) Annual Maintenance taken as 0.5% of contractors earnings plus contingencies			

This cursory analysis yields the following BC Ratios:

Table 19: Measure No. 2 Benefit Cost Ratios

	Normal AA Benefits	SC' AA Benefits
AA Benefits	$ 30,000	$ 59,000
AA Costs	$ 386,800	$ 386,800
BC Ratio	**0.08**	**0.15**

Measure No. 3 average annual costs are shown below.

Table 20: Measure No. 3 Average Annual Costs

Measure No. 3 - Flood Bench with Ice Control Structures			**3.125%** Dec-15 Prices
Total First Costs			
Contractors Earning Plus Continencies - Flood Bench		$	6,896,995
Contractors Earning Plus Continencies - Ice Control Structure		$	3,301,830
Engineering And Design	10%	$	1,019,882
Supervision & Administration	15%	$	1,529,824
Lands, Easements, Rights Of Way, Relocations & Disposal Costs	(4)	$	440,183
Total First Costs		**$**	**13,188,714**
Investment Costs			
Total First Costs		$	13,188,714
Interest During Construction (1)		$	181,600
Investment Costs		**$**	**13,370,314**
Average Annual Costs			
Investment Costs		$	13,370,314
Partial Payment Factor (2)			0.0397930
Average Annual Costs		$	532,000
Annual Maintenance (3)	0.5%	$	34,500
Total Average Annual Costs		**$**	**566,500**

(1) Interest during construction assumed a straight line utilization of first cost requirements with the remainder of funds being utilized against a 12 month construction schedule at 3.125% annual interest rate

(2) PP Fctr based on 50 yr project life and a 3.125% annual interest rate

(3) Annual Maintenance taken as 0.5% of contractors earnings plus contingencies

(4) LERRD is based on 10% of ice control structure costs plus a flat rate of $110,000 for the Flood Bench

This cursory analysis yields the following BC Ratios:

Table 21: Measure No. 3 Benefit Cost Ratios

	Normal AA Benefits	SC' AA Benefits
AA Benefits	$ 30,000	$ 59,000
AA Costs	$ 566,500	$ 566,500
BC Ratio	**0.05**	**0.10**

Given the stated assumptions, analysis and noted benefit-cost ratios, there appears to be little evidence for a federal interest in the Lexington Green area of West Seneca.

Sensitivity analysis was performed by using the 'Stress Conservative' average annual assumptions. Additionally, if the costs of all the projects were halved, the BC ratios would continue to be below 1.0.

Given the first hand data, accounting for governmental receipts and the utilization of lost wages as well as the limited number of residences, lack of commercial presence, prior negative studies and very low BC ratios, it would be highly unlikely that a more thorough study would return a positive Federal interest.

A measure for raising individual properties out of the flood zone was screened from consideration early in the process. Costs are considerable for such projects, totaling over $80,000 per home when including engineering and construction costs. In addition, any homes which are elevated, basements cannot be used. Widespread acquisition and demolition of structures was also screened out from further consideration early in the study process as this measure would not promote community cohesion.

One non-structural measures was considered:

Measure No.4 – Flood Warning System.

The flood warning system is designed to give residences advanced warning of an impending flood. This would possibly allow residences to move vehicles and implement flood prevention measures such as sealing low water access points with sand bags or other temporary measures.

Table 22: Measure No. 4 Average Annual Costs

Measure No. 4 - Flood Warning System			3.125% Sep-12 Prices
Total First Costs			
Contractors Earning Plus Continencies		$	74,385
Engineering And Design	10%	$	7,439
Supervision & Administration	15%	$	11,158
Lands, Easements, Rights Of Way, Relocations & Disposal Costs	10%	$	7,439
Subtotal Costs		$	100,420
Escalation Factor - to index to 2016 price level	6.98%	$	7,009
Total First Costs		$	107,429
Investment Costs			
Total First Costs		$	107,429
Interest During Construction (1)		$	119
Investment Costs		$	107,548
Average Annual Costs			
Investment Costs		$	107,548
Partial Payment Factor (2)			0.0397930
Average Annual Costs		$	4,300
Annual Maintenance (3)	0.5%	$	400
Total Average Annual Costs		**$**	**4,700**

(1) Interest during construction assumed a straight line utilization of first cost requirements with the remainder of funds being utilized against a 2 month construction schedule at 3.125% annual interest rate

(2) PP Fctr based on 50 yr project life and a 3.125% annual interest rate

(3) Annual Maintenance taken as 0.5% of contractors earnings plus contingencies

The average annual cost of implementing a flood warning system is relatively low; $4,700. It is possible that this non-structural alternative could yield a benefit-cost ratio greater than 1.0 because residents might be provided some warning time to move contents and equipment to areas that are unlikely to flood.

Benefits are difficult to quantify though, as it is unknown how much advance warning time would be provided by the flood warning system. Ice jam floods tend to happen rapidly with little warning which would limit the effectiveness of the system which is based on water level gages. Additionally, ice jam floods tend to be very location centric. The flood warning system could easily be rendered ineffective if it is located to far up or down stream. Currently there is a gage located approximately a mile upstream in Gardenville. This gage did register a high water event prior to the January flood. This may make another gage redundant.

Economic Efficiency: Information provided by the town of West Seneca indicated that there have been some damages incurred due to recent flooding events though not at a level significant enough to deliver a more detailed study given the lack of economic benefits. Given the provided information it has been determined that a positive benefit cost ratio is unlikely to be generated by any structural project implemented to prevent future flood events. This initial evaluation has led to a determination that there is not federal interest in continuing a feasibility study in the Lexington Green area of West Seneca, NY.

7. Federal Interest: Based on the review of prior reports, the damages resulting from the 2014 flood event, and the preliminary economic analysis prepared for this report, it has been determined that there is a negative federal interest for a flood damage reduction project at Lexington Green.

8. Recommendations: The Buffalo District recommends the termination of this study based on consistency with Army and budgetary policies and based on the above alternatives as identified in this Federal Interest Determination.

9. Views of the Sponsor: If this project were to be pursued the New York State Department of Environmental Conservation would need to agree to be the non-Federal sponsor and provide the necessary letter of intent. Under New York State Conservation law, the NYS Department of Environmental Conservation must be the non-Federal sponsor for FRM (Flood Risk Reduction project) projects.

10. Views of Other Resource Agencies: N/A

11. Project Area Map:

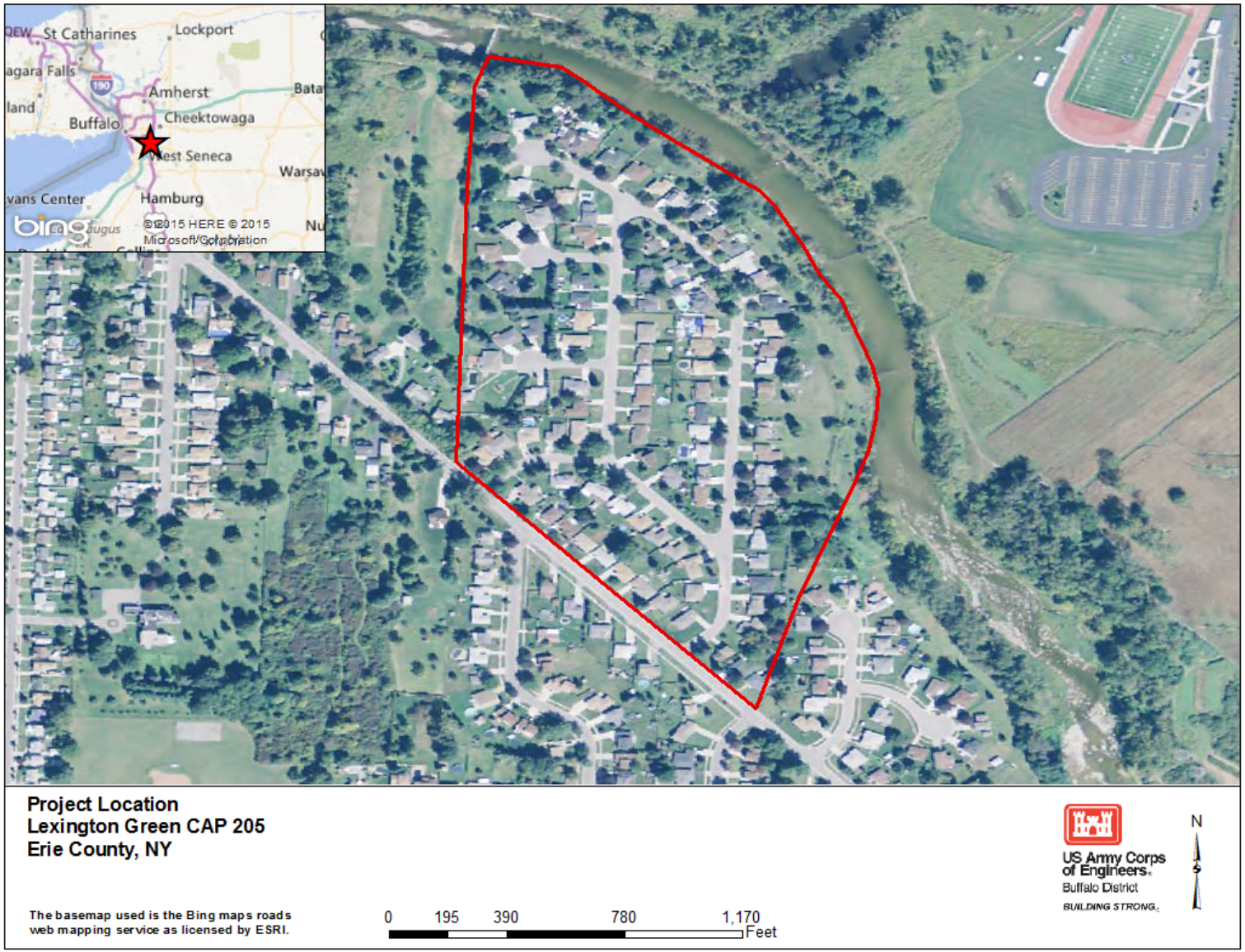

Figure 10: Project Area Map

References:

U.S. Army Corps of Engineers, Flood Plain Information Buffalo Creek N.Y. In the Villages of Elma and West Seneca. Buffalo, NY; April 1966.

U.S. Army Corps of Engineers, Assessment of Streambank Erosion for Major Streams of the Buffalo District. Buffalo, NY; September 1977.

U.S. Army Corps of Engineers, Flood Plain Management Planning Assistance For The town of West Seneca New York: Buffalo Creek. Buffalo, NY; September 1979.

FEMA, Flood Insurance Study: town of West Seneca, New York Erie County. Buffalo, NY; September 1992a.

U.S. Army Corps of Engineers, Earsing Sills Safety Study for the USDA, Soil Conservation Service: Buffalo Creek town of West Seneca, New York. Buffalo, NY; August 1992b.

Ecology and Environment Inc., Oxbow Habitat Restoration Plan: Buffalo Creek, West Seneca. Lancaster, NY; December 2010.

National Oceanic and Atmospheric Administration (NOAA). National Climate Data Center's Climate Data Online. http://www.ncdc.noaa.gov. Station ID COOP: 301012 Accessed 18 August 2015.

Guidelines for Determining "Flood Flow Frequency" Bulletin #17B of the Hydrology Committee, U.S. Water Resources Council, September 1981.

Attachment 1 - Factsheet

CAP

US Army Corps of Engineers
Buffalo District

FACT SHEET **February 2016**

BUFFALO CREEK, LEXINGTON GREEN, WEST SENECA, NY

Small Flood Control Projects
Section 205 of the Flood Control Act of 1948, as amended
Construction General (Continuing Authorities Program)

Location

- In West Seneca, Erie County, New York immediately east of the city of Buffalo

Project Description

- The Section 205 Authority provides for local protection from flooding by the construction or improvement of flood control works such as levees, channels, and dams
- Feasibility phase is cost-shared 50% Federal and 50% non-Federal
- Design and Implementation is cost-shared 65% Federal and 35% non-Federal

Importance

- Flooding has periodically plagued the Lexington Green residential neighborhood in West Seneca, NY
- An ice jam flood event in January 2014 precipitated assistance from the Corps

Consequences

- If a project is not pursued, and measures implemented, the town of West Seneca may continue to be impacted by flood events along Buffalo Creek

Project Phase	Est. Fed. Cost of Phase	Federal Funding through FY15	FY16 Requirement	FY16 Budget	FY17 Requirement	FY17 Budget
Feasibility[1]	TBD	$50k	$0	$0	$0	NA

(1) First $100k is at 100% Federal expense.

Project Sponsor/Customer

- Town of West Seneca, NY
- NYSDEC, under NYS law, the NYSDEC must be the signatory on Section 205 projects

Congressional Interests

- Representative Brian Higgins R-NY-26
- Senator Charles Schumer D-NY
- Senator Kirsten Gillibrand D-NY

Current Status

- A letter dated February 20, 2014 was sent to the sent to the Buffalo District requesting assistance under the Section 205 authority.

Issues

- The costs to implement a project would be greater than the economic benefits achieved, therefore a study will not be pursued. The Corps will work with the town of West Seneca to communicate measures which could reduce the impacts of future flood events.

Lexington Green, West Seneca, NY –
Source: Google maps

Photos from West Seneca, NY – Lexington Green,

Photos from West Seneca, NY – Lexington Green,

Project Manager: Lex Barker, PMP, (716) 879-4135, lex.c.barker@usace.army.mil

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Attachment 2 - Letter of Intent

TOWN OF WEST SENECA

SHEILA M. MEEGAN
TOWN SUPERVISOR

February 20, 2014

Lieutenant Colonel Owen J. Beaudoin
District Commander
U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

ATTN: Planning Branch

Dear LTC Beaudoin:

On January 11, 2014, residents of the Town of West Seneca, NY experienced a damaging ice-jam flood resulting from waters of the Buffalo Creek overtopping its levees.

In accordance with the provisions of Section 205 of the Flood Control Act of 1948, as amended, the Town of West Seneca, NY is requesting U.S. Army Corps of Engineers assistance in addressing a flooding problem at Buffalo Creek adjacent to the Lexington Green development.

We are fully aware of the following non-Federal requirements associated with projects under the Section 205 Authority.

Feasibility Phase: Is funded by the Federal government for the first $100,000. All feasibility study costs over $100,000 are cost-shared 50% Federal and 50% non-Federal.

Implementation Phase: Is cost-shared 65% Federal and 35% non-Federal.

The non-Federal sponsor is responsible for costs of all lands, easements, relocations and disposal areas, plus a cash contribution of at least 5% of the total project cost.

We are aware that this letter serves as an expression of non-Federal intent to cooperate on this project and is not a contract obligation. Either party may discontinue this effort at any point prior to construction.

Sheila Meegan
Town Supervisor
Town of West Seneca, NY

TOWN HALL 1250 UNION ROAD • WEST SENECA, NEW YORK 14224 • (716) 558-3253 • FAX (716) 675-7205
www.westseneca.net Email: smeegan@twsny.org

Printed On Recycled Paper

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Attachment 3 - District Quality Control

DISTRICT QUALITY CONTROL REVIEW CERTIFICATION

Project Title: Buffalo Creek, Lexington Green, West Seneca, NY Section 205
Phase or Type of Project: Federal Interest Determination
Certification Date: 19 FEB 2016

Notice is hereby given that a District Quality Control Review (DQCR) performed at Federal Interest Determination (FID) completion that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Quality Control Plan. During the DQCR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The District Quality Control Review was accomplished by an independent team. All comments resulting from DQCR have been resolved. The comments and resolution are attached.

ORTIZ.LAURA.V.1228662395 Digitally signed by ORTIZ.LAURA.V.1228662395 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=ORTIZ.LAURA.V.1228662395 Date: 2016.02.23 16:09:33 -05'00'

Plan Formulator / Date

BARKER.LEX.C.1292099238 Digitally signed by BARKER.LEX.C.1292099238 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=BARKER.LEX.C.1292099238 Date: 2016.02.23 06:53:54 -05'00'

Project Manager / Date

CERTIFICATION OF DISTRICT QUALITY CONTROL REVIEW

All concerns resulting from District Quality Control Review of the project have been fully resolved.

Craig M Forgette Digitally signed by FORGETTE.CRAIG.M.1228697474 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=FORGETTE.CRAIG.M.1228697474 Date: 2016.02.22 16:06:19 -05'00'

Chief, Planning Management Team/ CAP Manager / Date

UNCLASSIFIED\\FOR OFFICIAL USE ONLY

Comment Report: All Comments
Project: LRB - Buffalo Creek - Lexington Green - CAP 205
Review: DQC Review of DFI
Displaying 20 comments for the criteria specified in this report.

Id	Discipline	Section/Figure	Page Number	Line Number
6351543	Real Estate	n/a	29	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

The 3 measures listed, Levee, Bench and Bench with ICS do not match the tables. Table 12 is Levee, Table 13 is Bench and then Table 14 is Flood Warning System.

Submitted By: Jennifer Janik (716-879-4113). Submitted On: Jan 12 2016

1-0 Evaluation **Concurred**
We have renumbered the tables. Additionally, Nate will go in and create a more thorough table for 13 to include the total costs (levee and ICS).

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Jennifer Janik (716-879-4113) Submitted On: Jan 25 2016
Current Comment Status: **Comment Closed**

6354621	Design Team Leader	n/a	Page 5	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

The second last paragraph appears to be incomplete in that it reiterates the conclusion of the 1979 study, yet includes the question "why was this not done?". Recommend either elaborating on the recommeded plan from this study and describing why it was not implemented, or else eliminating this paragraph.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **Concurred**
We elaborated that no information was present as to why or why not the conclusion from the 1979 report was not implemented.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 20 2016
Current Comment Status: **Comment Closed**

6354624 Design Team Leader Section 6.A Page 7 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Recommend including a brief paragraph after the second paragraph describing the flooding event of 2014. In its current form, the second paragraph describes conditions BEFORE 2014, and the next paragraph describes events AFTER the 2014 flooding event. Sequentially, a description of the 2014 event should be included between these paragraphs.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **Concurred**
Added recommended paragraph.

Submitted By: Ryan Pickett (716-879-4234) Submitted On: Jan 19 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 19 2016
Current Comment Status: **Comment Closed**

6354626 Design Team Leader Section 6.A Page 7 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Third Paragraph - Figure 3 illustrates the 100 year flood, rather than Figure 2.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **Concurred**
Numbering was changed.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Open Comment**
Numbering was not changed. Sentence still reads "As shown in Figure 2..." and it should reference Figure 3.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 25 2016

1-2 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 29 2016

Current Comment Status: **Comment Closed**

6354631 Design Team Leader Section 6.B Page 10 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Constraint No. 4 appears to be incomplete. Should this read "Plan must not adversely impact natural and existing flow regimes and water quality."?

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **Concurred**
Constraint 4 was updated to convey a fully formed thought.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 20 2016

Current Comment Status: **Comment Closed**

6354641 Design Team Leader Section 6.B Page 10 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Objectives 3-5 seem to be constraints rather than objectives. Recommend consideration of moving these up to the Constraints.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **Non-concurred**
We believe that Objectives 3 and 4 are indeed objectives. However, we did revise number 5 to be better worded with regards to the EOPs.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 20 2016

Current Comment Status: **Comment Closed**

6354644 Design Team Leader Section 6.B Page 10 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Problems - Prior to 1979, were the flooding problems experienced primarily attributable to ice jams? If not, recommend consideration of revising the first sentence.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **For Information Only**
The prior reports attribute the flooding to ice james, so the current wording is correct.

Submitted By: Ryan Pickett (716-879-4234) Submitted On: Jan 19 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 19 2016
Current Comment Status: **Comment Closed**

6354663 Design Team Leader n/a Page 15 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Measure 1 - The reported cut and fill quantities and listed Rough Order of Magnitude cost do not match the figures reported in Table 12. Confirm and correct as appropriate.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

Revised Jan 14 2016.

1-0 Evaluation **Concurred**
After discussion with H&H the numbers in the tables are correct and the descriptions/narrative on the measures were corrected.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Open Comment**
The Rough Order of Magnitude cost of $4,225,000 was not corrected and does not match the figure in Table 12 ($5,338,048).

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 25 2016

1-2 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 28 2016
Current Comment Status: **Comment Closed**

6354677 Design Team Leader n/a Page 15 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Measure 2 - The reported cut and fill quantities and listed Rough Order of Magnitude cost do not match the figures reported in Table 13. Confirm and correct as appropriate. Additionally, the description indicates a flood bench width of approximately 300 feet, however Figure 8 indicates a width of 210 feet. Correct one or the other.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **Concurred**
The narrative was updated to ensure continuity throughout the DFI.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 25 2016
Current Comment Status: **Comment Closed**

6354682 Design Team Leader n/a Page 15 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Measure 2 - Recommend including a cross-section or image of a typical flood bench.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **Non-concurred**
The PDT feels that for the DFI the qualitative description is enough to convey the measure accurately due to the DFI showing that there is a negative Federal interest. If there was a positive interest we would include a cross-section view.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 20 2016
Current Comment Status: **Comment Closed**

6354697 Design Team Leader n/a Page 17 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Measure 3 - It is stated that in order to consider an ice control structure, Measure 2 (Flood Bench) would also be needed. The reported Rough Order of Magnitude cost for Measure 3 (which also does not agree with the cost indicated on Page 30) is less than the Measure 2 cost. Subsequently, the Measure 3 cost should be more than the Measure 2 cost. Confirm and correct as appropriate.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **Concurred**
An updated table will be provided by cost to ensure that the total costs are correctly reported. Additionally, a sentence was added that stated the ICS and bench together would cost upwards of $12 million.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Open Comment**
An updated table has not been included.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 25 2016

1-2 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 29 2016

Current Comment Status: **Comment Closed**

6354745 Design Team Leader n/a Page 19 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Measures 4 and 5 - Unlike the previous 3 measures, no Rough Order of Magnitude costs are reported for these measures. Do costs need to be developed and reported for these measures? Note that Table 14 presents costs for Measure 4, so costs have already been developed for this measure.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

Revised Jan 14 2016.

1-0 Evaluation **Concurred**
A ROM was provided for measure 4 (as noted costs have already been created). However, no ROM was prepared due to the fact that this measure cannot actually be addressed under section 205 projects. It is only included as a recommendation if the Town wishes to pursue it.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 20 2016

Current Comment Status: **Comment Closed**

6354778 Design Team Leader n/a Page 21 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Second Last Paragraph - It is stated that there is limited information about damages associated with the most recent flood events, however under the Fourth Last Paragraph, it is stated that the town provided detailed information on the damages and costs associated with recent flooding events. As these statement appear to be contradictory, correct one or the other as appropriate.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

1-0 Evaluation **Concurred**
Revised paragraph to state that we have detailed information with regards to the 2014 flood damages in the area; however, the previous flood damages are not as detailed.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 20 2016
Current Comment Status: **Comment Closed**

6354832 Design Team Leader n/a Page 30 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Measure 3 - To be consisent with the other cost estimate tables in this section, recommend converting the cost information for Measure 3 into Table 14, and renumbering subsequent tables. Current costs do not account for L&D, PED, and CM (only contract costs were indexed up). Additionally, since Measure 3 requires inclusion of items associated with Measure 2 (Flood Bench), associated costs with this measure should be reported as well, and the total cost for Measure 3 should increase over the current figure being reported.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 14 2016

Revised Jan 14 2016.

1-0 Evaluation **Concurred**
Cost is working through revising this table to ensure all comments are addressed.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Open Comment**
An updated Table 14 cost breakdown has not been included.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 25 2016

2-0 Evaluation **Concurred**
Cost information for Measure 3 presented in a tabular format. The cost of this measure has increased, so revisions to Economics section will be required and coordinated.

Submitted By: Paul Heist (716-879-4323) Submitted On: Jan 22 2016

2-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 29 2016
Current Comment Status: **Comment Closed**

6355316 Design Team Leader n/a Pages 29-31 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Cost Estimation - The specific unit cost breakdown tables seem more appropriate to be included in Attachment 8 vs. the main report text. Recommend relocating the detailed tables to Attachment 8. General cost summaries (i.e., Construction Cost, Contingency, Lands & Damages, PED, CM) may be more appropriate to include in Section 6.C, under the respective descriptions for the measures.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 15 2016

Revised Jan 15 2016.

1-0 Evaluation **Non-concurred**
The PDT feels that since this is a negative DFI these cost tables are more applicable within the report to show the basis for the negative federal interest based off the B/C ratios.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 20 2016
Current Comment Status: **Comment Closed**

6355325 Design Team Leader n/a Page 34 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Table 19 - Recommend making the following changes under the Total First Costs heading: Change "Contractors Earning Plus Contingencies" to "Contractors Earning Plus Contingencies - Flood Bench". Change "Ice Control Structure" to "Contractors Earning Plus Contingencies - Ice Control Structure". Also, the markups for E&D, S&A, and LERRDS should be applied to the combined cost of the Flood Bench and Ice Control Structure. Currently, the extended dollar amounts are only based on the Flood Bench construction cost.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 15 2016

1-0 Evaluation **Concurred**
Economics will change the tables to incorporate the changes stated.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Open Comment**
Requested changes have not been made.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 25 2016

1-2 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 29 2016

Current Comment Status: **Comment Closed**

6355336	Design Team Leader	n/a	Page 37	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Recommendations - Recommend deleting "(insert ice managment plan here)".

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 15 2016

1-0 Evaluation **Concurred**

The "(insert ice management plan here)" was deleted.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**

Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 20 2016

Current Comment Status: **Comment Closed**

6355337	Design Team Leader	n/a	Attachments	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Recommend eliminating attachments that are not used.

Submitted By: Todd Kufel (716-879-4273). Submitted On: Jan 15 2016

1-0 Evaluation **Concurred**

Non-used attachments have been deleted from the report.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 20 2016

1-1 Backcheck Recommendation **Close Comment**

Closed without comment.

Submitted By: Todd Kufel (716-879-4273) Submitted On: Jan 20 2016

Current Comment Status: **Comment Closed**

6362266	Planning - Plan Formulation	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Please do a word search on the document to "replace all" of the terms "Determination of Federal Interest" with "Federal Interest Determination." Also change all references to "DFI" to "FID" as per recent LRD guidance. We are the only District that used the term DFI, and we now use the term FID.

Submitted By: Craig Forgette (716-879-4187). Submitted On: Jan 22 2016

1-0 Evaluation **Concurred**
"Determination of Federal Interest" changed to "Federal Interest Determination."
"DFI" changed to "FID".

Submitted By: Lex Barker (716-879-4135) Submitted On: Jan 22 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Craig Forgette (716-879-4187) Submitted On: Jan 28 2016
Current Comment Status: **Comment Closed**

6362348	Planning - Plan Formulation	n/a	12, and throughout document	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Throughout the document, several different conventions are used for pressenting elevations:
430 feet NAVD88
585.5 (NAVD88)
603.5 feet (NAVD88)

Please change all to be in the following format:
603.5 feet (NAVD88), or 604 feet (NGVD29).

Also, page 12 description of Measure 1 is the only elevation description in paragraph format to use NGVD29. Suggest chaning that to NAVD88 in the text for consistency throughout the report. Keep the elevations showing both NGVD29 an NAVD88 in Table 2.

Submitted By: Craig Forgette (716-879-4187). Submitted On: Jan 22 2016

1-0 Evaluation **Concurred**
Agreed, it is changed in the text.

Submitted By: Michael Voorhees (716-879-4488) Submitted On: Jan 26 2016

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Craig Forgette (716-879-4187) Submitted On: Jan 28 2016
Current Comment Status: **Comment Closed**

Attachment 4 – Legal Review

Attachment 4 - CERTIFICATION OF LEGAL REVIEW

CERTIFICATION OF LEGAL REVIEW

The Federal Interest Determination (FID) for the Buffalo Creek, Lexington Green, West Seneca, NY Section 205 Project has been fully reviewed by the Office of Counsel, USAED Buffalo District and the decision documentation is legally sufficient for the FID.

BARCZAK.MICHELLE.FRANCES.1023647504

Digitally signed by BARCZAK.MICHELLE.FRANCES.1023647504
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=BARCZAK.MICHELLE.FRANCES.1023647504
Date: 2016.02.23 08:23:31 -05'00'

Name, District Counsel

Date: _____