NYS ROUTE 17 - Elmira to Chemung
DESIGN REPORT/DRAFT ENVIRONMENTAL IMPACT STATEMENT
PIN 6066.58

Appendix D
Draft Flood Plain Evaluation Report

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July 2004
I. INTRODUCTION

In accordance with the provisions of Executive Order 11988, Flood Plain Management, as implemented in 23CFR650 Subpart A, Location and Hydraulic Design of Encroachments on Flood Plains and 6NYCRR 502, Flood Plain Management Criteria for State Projects, this action has considered and evaluated the practicability of alternatives to any significant encroachments or any support of incompatible floodplain development.

II. PROJECT DESCRIPTION

The existing NYS Route 17 roadway condition contains multiple at-grade access points. This project consists of the reconstruction of NYS Route 17 to a controlled access principal arterial expressway, future I-86. The build alternatives consist of roadway modifications that will result in varying degrees of horizontal alignment shift of NYS Route 17 towards the Chemung River. A description of the project alternatives is listed below.

- **Alternative 1: Null alternative.**

- **Alternative 2: Controlled Access of NYS Route 17 on Existing Alignment:** This alternative constructs a controlled access NYS Route 17, primarily on its existing alignment. It eliminates all at-grade access points and increases the median width to 18 m (60 ft). Alternative 2 provides local access by connecting the three sections of County Road 60 east and west of Lowman as a complete frontage road from Jerusalem Hill Road / Water Street to just east of Reed’s Tavern. This access road connects to Jerusalem Hill Road approximately 100m (300 ft.) west of the existing Town Highway Building. The existing NYS Route 17 westbound exit ramp will remain under this alternative. / Water Street by way of the NYS Route 17 westbound exit ramp. The existing westbound exit ramp to Jerusalem Hill Road / Water Street will be relocated east, crossing over County Road 60.

- **Alternative 2 - Option A: Interchange at Newtown Battlefield Road:** This option constructs a new diamond interchange on NYS Route 17 at the Newtown Battlefield Road. Local traffic would access Route 17 via the Interchange. Brant and Oneida Road (County Road 60) would be connected with cul-de-sacs provided at each end. This option does not connect County Road 60 to Jerusalem Hill Road / Water Street to the west end of the project, nor does it connect Oneida Road to County Road 60 to the east. No additional improvements would be made to County Road 60 west of Lowman. This option includes the reconstruction of County Road 60 east of Lowman as discussed under Alternative 2.
Alternative 2 - Option B: Interchange East of Reed’s Tavern: This option constructs a new diamond interchange on NYS Route 17 east of Reed’s Tavern. This alternative would require the realignment of a 0.90 km (0.55 mi) section of County Road 60 to connect to the interchange. No additional improvements would be made to County Road 60 east of Lowman. This alternative includes the connection of the three sections of County Road 60 to provide a continuous local road from Reed’s Tavern to Jerusalem Hill Road / Water Street as discussed under Alternative 2.

Alternative 2 - Option C: Interchange at Battlefield and east of Reed’s Tavern: This option is the combination of both Options A and B. That is, two new diamond interchanges would be constructed – one at Newtown Battlefield Road and the other East of Reed’s Tavern. This option would also include the County Road 60 link between Brant and Oneida Roads, and a realigning of a 0.90 km (0.55 mi.) section of County Road 60 to connect to the interchange near Reed’s Tavern. No other additional improvements would be made to County Road 60.

Alternative 2-J: Controlled Access of NYS Route 17 on Existing Alignment with Connection of CR 60 to Water Street by Way of the NYS Route 17 Westbound Exit Ramp: This is the same as Alternative 2, except that instead of connecting CR 60 to Jerusalem Hill Road approximately 100m (300 ft.) west of the existing Town Highway Building, CR 60 will connect to Water Street by way of the NYS Route 17 westbound exit ramp. The existing westbound exit ramp to Jerusalem Hill Road / Water Street will be relocated east, crossing over County Road 60.

Alternative 2 – Option B-J: Interchange East of Reed’s Tavern with Connection of CR 60 to Water Street by Way of the NYS Route 17 Westbound Exit Ramp: This is the same as Alternative 2 – Option B, except that instead of connecting CR 60 to Jerusalem Hill Road approximately 100m (300 ft.) west of the existing Town Highway Building, CR 60 will connect to Water Street by way of the NYS Route 17 westbound exit ramp. The existing westbound exit ramp to Jerusalem Hill Road / Water Street will be relocated east, crossing over County Road 60.

Alternative 2, Alternative 2 with Options A, B, and C, Alternative 2-J, and Alternative 2 Option B-J, are designed to incorporate an 18-meter (60 ft) median between the westbound and eastbound lanes of NYS Route 17. This results in an approximate 10 to 18 meter (32 to 60 ft.) shift of the eastbound lanes towards the Chemung River. Alternative 2 with Options A, B, and C, and Alternative 2 Option B-J include interchange reconstruction that also results in a shift towards the Chemung River.

III. BACKGROUND INFORMATION
The existing conditions 100-year flood boundary and the floodway for the Chemung River within the project limits are plotted on the Flood Plains and Floodway Maps in Appendix A, and are defined by the following sources:


The Chemung River flows south-east along NYS Route 17 through the Towns of Elmira, Ashland, and Chemung. The Chemung River has the following characteristics based on Table 1- Summary of Discharges, Page 7 of the Town of Elmira Flood Insurance Study (FIS), and Table 1- Summary of Discharges, Page 6 of the Town of Chemung Flood Insurance Study (FIS).

### Town of Elmira Flood Insurance Study (FIS):

<table>
<thead>
<tr>
<th>Flooding Source and Location</th>
<th>Drainage Area</th>
<th>10-year</th>
<th>50-year</th>
<th>100-year</th>
<th>500-year</th>
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<tbody>
<tr>
<td>CHEMUNG RIVER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upstream from Confluence of Newtown Creek</td>
<td>5605 sq. km. (2165 sq. mi.)</td>
<td>1155 cms (40,800 cfs)</td>
<td>1866 cms (65,900 cfs)</td>
<td>2265 cms (80,000 cfs)</td>
<td>3483 cms (123,000 cfs)</td>
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<tr>
<td>Seeley Creek to Newtown Creek</td>
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<td>1954 cms (69,000 cfs)</td>
<td>2379 cms (84,000 cfs)</td>
<td>3738 cms (132,000 cfs)</td>
</tr>
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</table>

### Town of Chemung Flood Insurance Study (FIS):

<table>
<thead>
<tr>
<th>Flooding Source and Location</th>
<th>Drainage Area</th>
<th>10-year</th>
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<th>500-year</th>
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</thead>
<tbody>
<tr>
<td>CHEMUNG RIVER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Confluence of Wynkoop Creek</td>
<td>6488 sq. km. (2506 sq. mi.)</td>
<td>1487 cms (52,500 cfs)</td>
<td>2379 cms (84,000 cfs)</td>
<td>2832 cms (100,000 cfs)</td>
<td>4191 cms (148,000 cfs)</td>
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As part of the data collection effort, contacts were also made with the NYSDEC Elmira Office and the NYSDOT Chemung County residency to obtain historic information concerning the overtopping of Route 17. Both the NYSDEC and NYSDOT were unable to provide any records of floodwaters overtopping Route 17 since the 1972 Hurricane Agnes event. The USGS Hydraulic Investigations Atlas HA-518 (Flood of June 1972 at Elmira, New York) was also obtained and reviewed. The peak flow for the 1972 flood, as measured at the Chemung gauging station, was 189,000 cfs and was, at the time, considered to be a 500-year event. Since construction of the Tioga-Hammond and Cowanesque Dams (after the 1972 flood) the 500-year event at Chemung has been adjusted downward to 148,000 cfs, and the 500-year flood discharges have also been adjusted downward accordingly.

A contact was also made to FEMA to determine if revisions to the Chemung River frequency vs. discharge relationships are being considered, that would revise the effective FIS data used to perform this evaluation. It was confirmed that there are no revisions of any kind planned for the Town of Elmira, Ashland, and Chemung FIS’s.

The existing conditions 100-year flood boundary for the Chemung River is in close proximity (both horizontally and vertically) to NYS Route 17 throughout a significant portion of the project limits. However, only two general locations that include potential lateral encroachment into the floodplain were identified using the FIRM developed for the Towns of Elmira, and Chemung. These two general areas are illustrated in Figure 1 and Figure 2.
Figure 1 – Floodplain Encroachment Area: West #1
Figure 2 – Floodplain Encroachment Area: East #1
The Chemung River floodway data and flood profiles are provided in Appendix B of this report.

Detailed hydrologic and hydraulic analyses performed in the FIS indicate the following:

1. In the project area, the 500-year flood for the Chemung River does overtop NYS Route 17 in a few locations.

2. In the project area, the 100-year flood elevation for the Chemung River is between 1.5 m (5 ft) and 1.0 m (3 ft) below the existing NYS Route 17 roadway elevation in the locations indicated in Figures 1 and 2.

IV. STATE AND FEDERAL REGULATIONS

Portions of both existing Route 17, and future I-86, within the project limits are located adjacent to or within the 100 year flood plain and are thus defined as potential lateral encroachments. The design of lateral encroachments must comply with EO 11988, 23CFR Part 650A and NYCRR Part 502 regulations. EO 11988, dated May 24, 1977, requires each Federal agency, in carrying out it’s activities, to take action to reduce the risk of flood loss, minimize the impacts of floods, restore and preserve the natural and beneficial values served by flood plains, and evaluate the potential effects of any actions it may take in the flood plain so as to ensure it’s planning programs reflect considerations of flood hazards and flood plain management. It states in 23CFR Part 650A that it is the policy of FHWA to encourage a broad and unified effort to prevent uneconomic, hazardous or incompatible use and development of the Nation’s flood plains; to avoid longitudinal encroachments where practicable; to avoid significant encroachments, where practicable; to minimize impacts of highway agency actions which adversely affect base flood plains; to restore and preserve the natural and beneficial flood plain values that are adversely impacted by highway agency actions; to avoid support of incompatible flood plain development; to be consistent with the intent of the standards and criteria of the National Flood Insurance Program, where appropriate; and to incorporate “A Unified National Program for Floodplain Management” of the Water Resources Council into FHWA procedures. The State’s Part 502 regulations are implemented to ensure that the use of State owned lands and the siting, construction, administration and disposition of State-owned and State-financed facilities are conducted in ways that will minimize flood hazards and losses.

The two guidelines from the above referenced regulations that most control the establishment of the highway plan and profile are summarized below:

1. 23 CFR Part 650.115(a)(2), (3) – “The design flood for encroachments by through lanes of Interstate highways shall not be less than the flood with a 2 percent (50-
No minimum design flood is specified for Interstate highway ramps and frontage roads or for other highways. Freeboard shall be provided, where practicable, to protect bridge structures from debris and scour related failure.”

2. NYCRR Part 502.4(b)(5) – “No portion of the project including encroachments, fill, new construction or substantial improvements shall be placed within the regulatory floodway that would result in any increase in flood levels during the occurrence of the base flood discharge, except where the effects of flood levels, due to the lack of floodway capacity is completely offset by the creation of equal flooding hydraulic capacity at that point.”

The 100-year water surface elevations and floodway limits from the Flood Insurance Studies for the Towns of Elmira, Ashland, and Chemung along with the project base mapping and existing Route 17 profile were used to address the two above referenced criteria.

V. DESIGN APPROACH

To comply with the above-referenced State and Federal regulations covering both roadway encroachments and roadway overtopping, the following rules were developed in setting the future I-86 plan and profile:

1. Provide for adequate freeboard to account for extreme events, ice, debris, and waves. This is accomplished when the Theoretical Grade Line (TGL) for both lanes of Route 17 are set, at a minimum, equal to the 100 year water surface elevation plus 2.125 feet (0.65 meters). The 2.125 feet (0.65 meters) includes 1.00 foot (0.30 meters) of freeboard plus 1.125 feet (0.35 meters) for the pavement and shoulder cross slope.

2. Where the proposed toe of fill slopes extend into the Chemung River floodway, retaining walls are provided as necessary to keep the proposed roadway fill out of the floodway.

3. Allow encroachment of the proposed toe of fill slopes into the Chemung River floodway fringe area (the area between the floodway boundary and floodplain boundary).

VI. EVALUATION OF ALTERNATIVES

To avoid interruption or termination of this transportation facility that is needed for emergency vehicles and evacuation, the proposed TGL for both lanes of NYS Route 17
was set at least 0.65 m (2.125 ft) above the 100-year flood elevation. This includes 0.30 m (1.0 ft) of freeboard plus 0.35 m (1.125 ft) to account for the pavement and shoulder cross slope. All alternatives meet this criteria and therefore will comply with State and Federal policies.

The proposed roadway design for Alternatives 2 and 2-J, and Alternate 2 Options A, B, C, and B-J when considering maximum 1V:2H side slopes results in the potential encroachment within the floodway of the Chemung River. To avoid encroachments into the floodway, retaining walls will be incorporated during final design at these specific locations. The location of the proposed retaining walls for each alternative are provided in the Floodplains Impact Maps in Appendix C. Alternatives 2 and 2-J, and Alternate 2 Options A, B, C, and B-J meet the criteria of having no encroachment into the floodway.

The fill from the construction of future I-86 for Alternatives 2 and 2-J, and Alternate 2 Options A, B, C, and B-J are also expected to encroach upon the 100-year floodway fringe area (i.e. the area between the floodway line and the 100-year flood plain boundary) at one location between stations WB 11+090 and WB 11+160. The encroachment area is computed as the area between the existing and proposed toe of slopes that is between the 100-year floodplain and the floodway. The encroachment area between stations WB11+090 and WB 11+160 is calculated at 0.01 hectares (0.025 acre). The total encroachment area is illustrated in the Floodplains Impact Maps in Appendix C.

The existing function of the fringe area will be unchanged as a result of the additional roadway encroachment on the floodway fringe, and it is not anticipated that the additional fill will result in an increase in the Base Flood (Q100) elevation for any of the alternatives.

VII. SUMMARY

This floodplain evaluation has considered the effects of the build alternatives in terms of encroachment, interruption, risk and impacts to natural resources, and concluded that: (1) a significant encroachment does not exist; (2) there is no significant potential for interruption or termination of a transportation facility which is needed for emergency vehicles; (3) there is no significant risk; and (4) there will be no significant impacts on natural and beneficial flood plain values.
APPENDIX A
Flood Plains and Floodway Maps

Draft Flood Plain Evaluation
NYS Route 17 Access – Elmira to Chemung
Towns of Elmira, Ashland and Chemung
Chemung County
P.I.N. 6066.58

July 2004
APPENDIX B
Chemung River Floodway
And Flood Profiles

Draft Flood Plain Evaluation
NYS Route 17 Access – Elmira to Chemung
Towns of Elmira, Ashland and Chemung
Chemung County
P.I.N. 6066.58

July 2004
<table>
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<th>CROSS SECTION</th>
<th>DISTANCE</th>
<th>WIDTH (FT.)</th>
<th>SECTION AREA (SQ. FT)</th>
<th>MEAN VELOCITY (F.P.S.)</th>
<th>WITH FLOODWAY (NOVD)</th>
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<th>DIFFERENCE (FT)</th>
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</table>

1 Feet above origin of study  2 Feet above mouth  3 This width extends beyond corporate limits

The origin of study is located 9,425 feet downstream of State Route 427 bridge in the Township of Athens, Bradford County, Pennsylvania
APPENDIX C
Flood Plains Impact Maps

Draft Flood Plain Evaluation
NYS Route 17 Access – Elmira to Chemung
Towns of Elmira, Ashland and Chemung
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