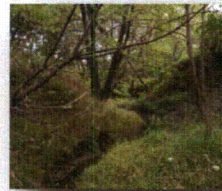
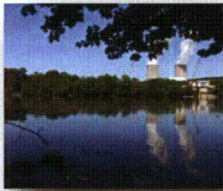


Bell Bend Nuclear Power Plant Flood Study Report Susquehanna River

Salem Township, Luzerne County, PA
LSI Doc. No. FS-SR-001



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Rev 3, August 16, 2011



PPL Bell Bend Nuclear Power Plant
Salem Township, Luzerne County, PA
August 16, 2011

Susquehanna River Flood Study Report

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Revision Notes:

- REV 1:** Replaced the duplicate effective model, which was previously based on the HEC-2 flood model used for the FEMA FIS, with the more recent HEC-RAS model developed by the US Army Corps of Engineers and adopted by FEMA.
- Rev 2:** Replaced intake structure figures in Appendix H with updated figures from the Joint Permit Plan set by Pennoni Associates, dated May 2011
- Rev 3:** Address comments received from FEMA dated June 30, 2011; these revisions included reverting back to the Current Effective Model used in Rev0, as well as other technical revisions



1 Introduction

PPL is proposing a new facility, the Bell Bend Nuclear Power Plant (BBNPP), on a site near Berwick, PA. The site is located in Salem Township, Luzerne County, northeast of Berwick near the existing Susquehanna Steam Electric Station (SSES) nuclear power plant. The water intake structure for the proposed facility will be located directly east of the proposed site along the Susquehanna River, downstream of the intake structure of the existing plant. The location is approximately 22 miles downstream of Wilkes-Barre, PA and 5 miles upstream of Berwick, PA. A FEMA Flood Study exists for the section of the Susquehanna River that will be impacted by the proposed intake structure. The FEMA study cross-sections were used as a basis for the flood analysis.

The objectives of this study are to determine the hydraulic effect of the proposed intake structure on the Susquehanna River and to determine the extent of the 100-year floodplain. This report presents the existing (pre-construction) floodplain characteristics modeled in HEC-RAS and how they compare to both the original FEMA floodplain characteristics taken from the HEC-2 model and to the proposed (post-construction) floodplain characteristics modeled in HEC-RAS.

2 Hydrology

Soils information and geology at the proposed BBNPP site and surrounding area were determined from Penn State University's online soil map tool (www.soilmap.psu.edu). Soils existing in the region of the proposed intake structure include Pope soils and Holly Silt Loams (hydrologic soil groups "B" and "D", respectively). A soils map is included in Appendix A.

The Hamilton Group geologic formation exists beneath the proposed intake structure site. It is an east to west trending band of the lower and middle Devonian-age Hamilton Group and is made up of two formations: the Mahantango Formation and the Marcellus Formation. The Mahantango Formation is composed of gray, brown and olive shale and siltstone while the Marcellus Formation is composed of black, carbonaceous shale. See the geologic map in Appendix A.

The Susquehanna River is 444 miles long, with its headwaters in New York. The entire Susquehanna River Basin covers 27,510 mi²; however, the drainage area to the location of the proposed intake structure equals approximately 10,600 mi². The 100-year peak flow used in the FEMA Flood Insurance Study (FIS) for this drainage area is 260,000 cfs. The maximum recorded flow rate was 345,000 cfs at the Wilkes-Barre gauging station (24 miles

upstream) and 363,000 cfs at the Danville gauging station (28 mi downstream) during Hurricane Agnes, which is similar to the 500 year flow rate (340,000 cfs) used in the FIS.

3 Hydraulics

3.1 General Description

The US Army Corps of Engineers HEC-RAS Version 4.1.0 software was used for the hydraulic analysis. HEC-RAS is intended for calculating water-surface profiles for steady or unsteady flow in natural or man-made channels. The computational procedure is based on the solution of the one-dimensional energy equation with energy loss due to friction computed using Manning's equation. The computational procedure is generally known as the Standard Step Method and can be used for subcritical as well as supercritical flow conditions. For this project, the water-surface profile for steady, subcritical flow was calculated.

The original FEMA FIS study was conducted in the vertical datum NGVD 29; therefore, the Existing and Proposed HEC-RAS Conditions were both modeled in the NGVD 29 vertical datum for comparison purposes. To illustrate the 100-year floodplain line in planform, however, the water surface elevations from each study were converted to vertical datum NAVD 88 to correspond to the most recent topographical information available. The conversion factor from NGVD 29 to NAVD 88 is -0.7 ft.

3.2 FEMA Flood Insurance Study (FIS) HEC-2 Model (Duplicate Effective Model A)

The FEMA FIS HEC-2 input data text file was acquired from the Susquehanna River Basin Commission (SRBC), which conducted the original study. The HEC-2 Input file was truncated to only include the cross sections included in this study. These included Cross Sections CP to CU from the FIS, which were labeled Cross Sections 6 through 12 in the HEC-2 Model. The HEC-2 input file was then run in HEC-2, as required by FEMA to create a "Duplicate Effective Model." The intent of this model was to recreate the original study, with the original software, on our equipment. Because Cross Section CP was the downstream limit of Duplicate Effective Model A, downstream boundary conditions at Section CP were set to match the modeled water surface elevations from the original FIS at this cross section for each profile. The HEC-2 input data and output text files for Duplicate Effective Model A are located in Appendix E.

3.3 FEMA (FIS) HEC-RAS Model (Duplicate Effective Model B)

The FEMA FIS HEC-2 input data was entered into HEC-RAS to develop a "control" model for comparison with the more detailed existing and proposed models to be discussed later. The model includes HEC-2 cross-sections extending from Station 1278+00 (FEMA FIS XS "CP"; HEC-2 cross section 6) to Station 1396+00 (FEMA FIS XS "CU"; HEC-2 cross section 12). The 100-year peak flow used in the FEMA FIS was applied to the model and the 100-year water surface elevation of 510.5 ft was used as the 100-year downstream boundary condition. A

subcritical flow regime was selected, as used in the HEC-2 analysis. HEC-RAS data for Duplicate Effective Model B is provided in Appendix F.

3.4 Corrected Effective Model

The Duplicate Effective Model B geometry was enhanced with more accurate topographic data to create a Corrected Effective Model. The FEMA cross-sections were enhanced on the west side of the Susquehanna River with existing topography from an aerial survey supplemented with available GIS data. The river bottom of each cross-section (except Station 1396+00, for lack of data) was also supplemented with bathymetry data from the Ecology III report entitled "Ecological Studies of the Susquehanna River in the vicinity of the Susquehanna Steam Electric Station" (August, 1983). The 1983 bathymetry data by Ecology III (formerly Ichthyological Associates, Inc.) was used in this flood study over other bathymetry reports for its accuracy, detail and long span of studied river in the area of the SSES and proposed BBNPP facilities (see Appendix J). The corrected effective model included the same cross sections as the duplicate effective model and utilized more accurate geometry data, but did not include any man-made features.

3.5 Existing Conditions

The existing conditions model is the basis for comparison for the evaluation of potential changes that could be caused by the proposed BBNPP intake structure. To accurately model the river hydraulics for comparison, two cross sections were added to the corrected effective model. One cross section was added at the location of the existing intake structure for SSES, and one cross section was added at the location of the proposed BBNPP intake. These cross sections were generated initially with the interpolation feature in HEC-RAS and then adjusted based on bathymetry data and available one-foot topographical data. The existing intake structure was modeled as a flow obstruction. The structure dimensions and invert for the water intake were determined from PPL Drawing M-57-3, Rev. 4. Design drawings and photographs of the existing intake structure are provided in Appendix K. Existing Manning's 'n' values were kept consistent with the FEMA FIS Manning's 'n' values.

The 100-year peak flow from the FEMA FIS of 260,000 cfs was used in the HEC-RAS existing conditions model. The downstream boundary condition was the known 100-year water surface elevation taken from the FEMA FIS (510.5 ft). A subcritical flow regime was assumed in the HEC-RAS analysis, consistent with the original model. Based on the model output, the subcritical flow assumption was verified. An encroachment analysis was also included in the Existing Conditions Model to establish the Floodway based on the more accurate geometry data used in this study. The Existing Conditions data is located in Appendix H).

3.6 Proposed Conditions

In the Proposed Conditions model, the existing conditions geometry was altered at Station 1331+38 to reflect the proposed intake structure conditions. The proposed structure was represented by an obstructed area within the cross-sectional geometry. The grading near the structure was also altered in the model; specifically the river bottom elevation was lowered to

correctly represent the dredging to occur for the structure's intake invert, and fill was added to reflect the access drive and pad behind the structure. For details of the proposed intake structure, see Appendix K. Floodplain Manning's 'n' values were decreased from existing condition's values to reflect the parking lot/imperious surfaces in proposed conditions.

The same flow information and boundary condition used in the existing conditions model were used in proposed conditions ($Q_{100} = 260,000$ cfs, downstream WSEL₁₀₀ = 510.5 ft). An encroachment analysis was also included in the Proposed Conditions Model for comparison with the Existing conditions Floodway. Proposed Conditions data can be found in Appendix I.

4 Results and Conclusions

A summary of 100-year flood elevations and velocities for all of the above models is provided in Appendix D. Duplicate Effective Model A successfully duplicates the flood elevations reported in the current FIS. Duplicate Effective Model B reports higher water surface elevations and lower velocities. It would appear that this is a result of slightly different modeling routines in HEC-2 and HEC-RAS. The Corrected Effective Model is reasonably consistent with the Duplicate Effective Model B, but the BFE does deviate by up to 0.50 ft (higher) in some locations.

The Existing Conditions model results are essentially identical to the Corrected Effective Model below the existing and proposed intake structures, where cross sections were added. Above the existing structure there is a slight increase in the BFE (+/- 0.10 ft). This increase is a result of the obstruction created by the existing intake structure.

The Proposed Conditions Model was compared to the Existing Conditions Model to determine the effect of the proposed intake structure on the 100-year flood elevation. Below the proposed intake structure, the BFE is identical to the Existing Conditions. At the proposed intake structure, the model actually shows a 100-year WSE decrease of 0.01 ft, and a velocity decrease of 0.12 ft/s. This is a result of the increased volume provided by the pool to be excavated in front of the structure. The intake structure itself, although modeled as an obstruction, is located primarily in a located that was modeled as ineffective flow area in the Existing Conditions model. The decrease in water surface elevation transitions to -0.05 ft at the existing intake structure (with a slight increase in velocity) and then stabilizes at -0.04 ft for the remainder of the upstream reach.

Since the proposed water surface elevations are equal to or lower than the existing water surface elevations, it can be concluded that the proposed intake structure for the BBNPP will have no negative hydraulic effect on the Susquehanna River and its floodplain. The elevation and extent of the 100-year floodplain will not be measurably increased at any location as a result of this project.

The Floodway in the Proposed Condition model is identical to that of the Existing Conditions model with the exception of Station 133138, where the Floodway shifts inward slightly to match the face of the proposed intake structure.

The existing and proposed 100-year and 500-year floodplain as well as the Floodway are plotted on the Floodplain Map in Appendix B. The plan vertical datum is NAVD 88. Because all models were prepared based on the NGVD 29 vertical datum, a conversion table is provided in Appendix D.

Appendix A: Maps

- Location Map
- Soils Map
- Geology Map



Source: Berwick, PA USGS 7.5-minute topographic quadrangle

Location

41°05'17" N, 76°07'54" W

Scale

1" = 2000'

Project Location Map

BBNPP Intake Structure on the Susquehanna River

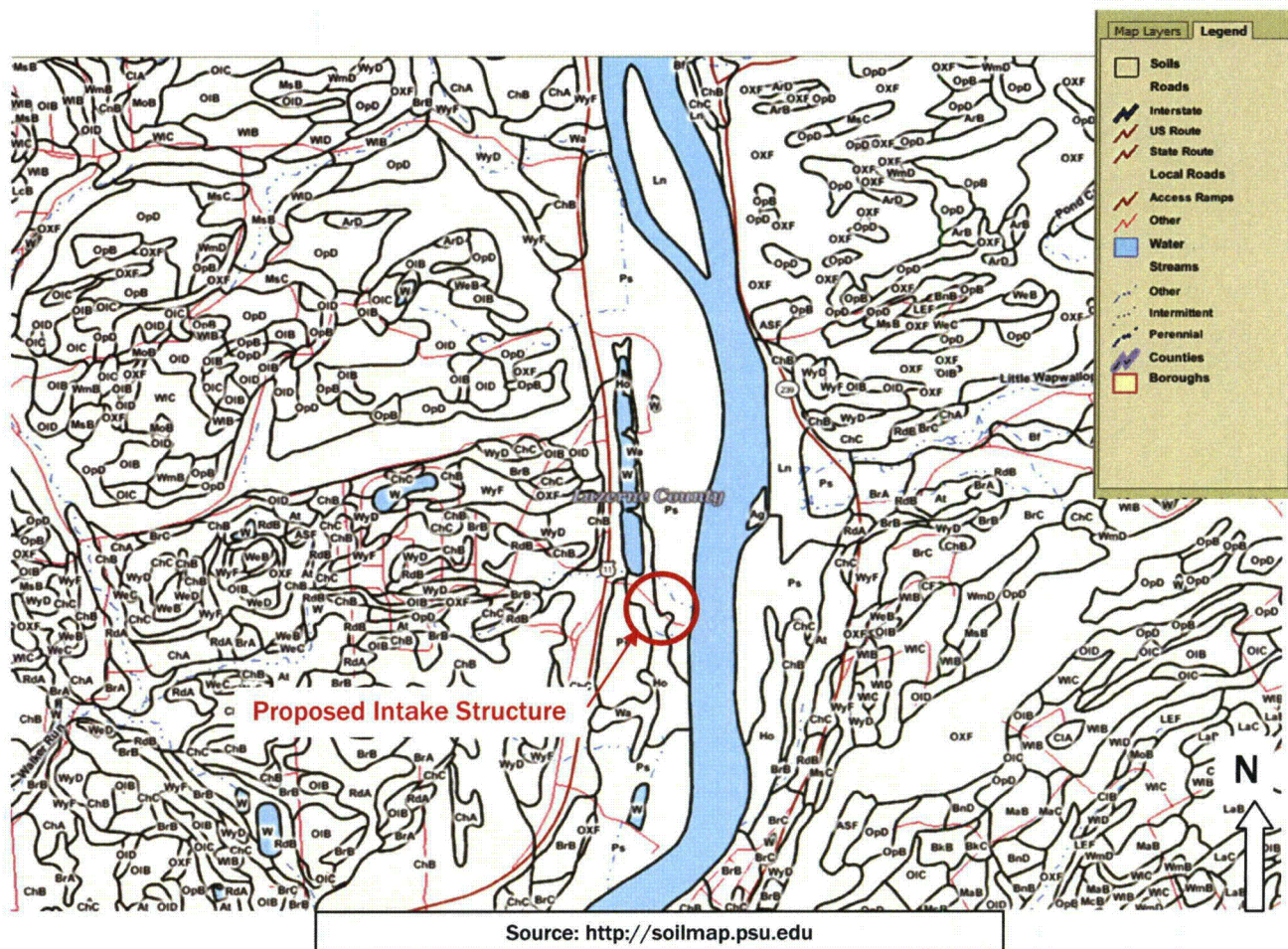


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Bell Bend Nuclear Power Plant

Salem Township, Luzerne County, PA

November 2010



Location

41°05'17" N, 76°07'54" W

Scale

1" = 2000'

Soils Location Map

BBNPP Intake Structure on the Susquehanna River

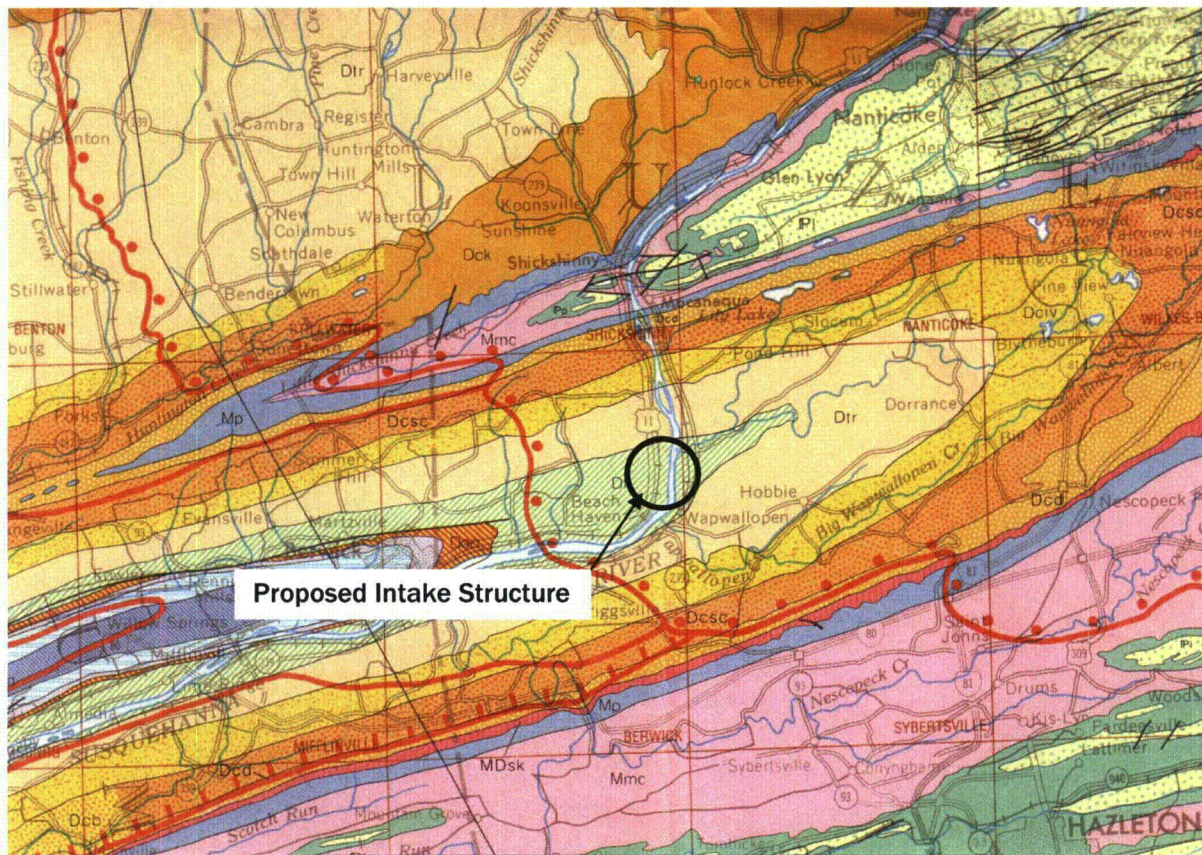


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Bell Bend Nuclear Power Plant

Salem Township, Luzerne County, PA

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Geologic Formation

Dh = Hamilton Group

Location

41°05'17" N, 76°07'54" W

Scale

1:250,000

Geology Map

BBNPP Intake Structure on the Susquehanna River



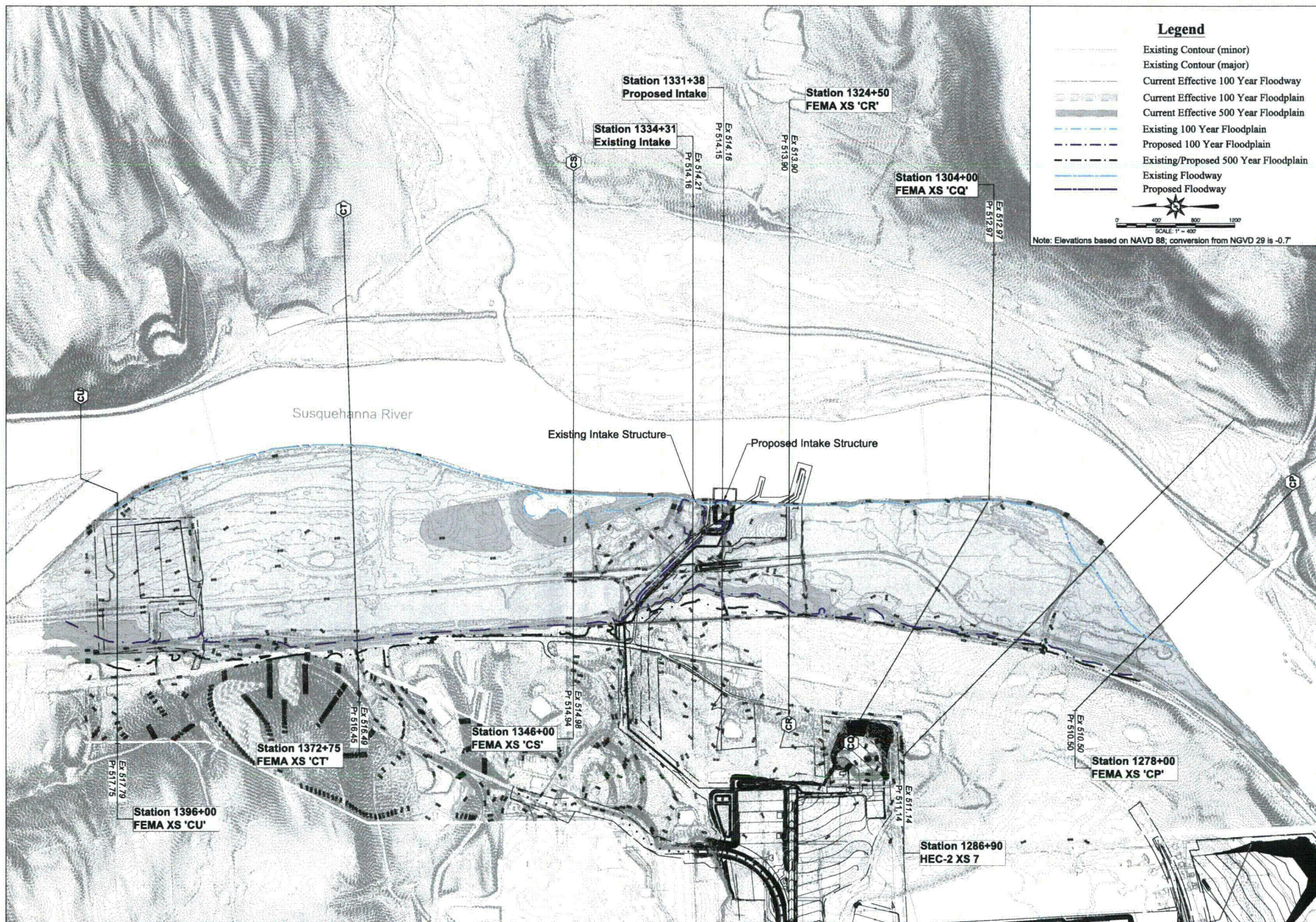
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Salem Township, Luzerne County, PA

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Appendix B:
Floodplain Map



PA 000000

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Land
Studies

PROJECT:
BELL BEND NUCLEAR POWER
PLANT
PPL BELL BEND, LLC.
38 BOMBAY LANE, SUITE 2
BERWICK, PENNSYLVANIA 18803

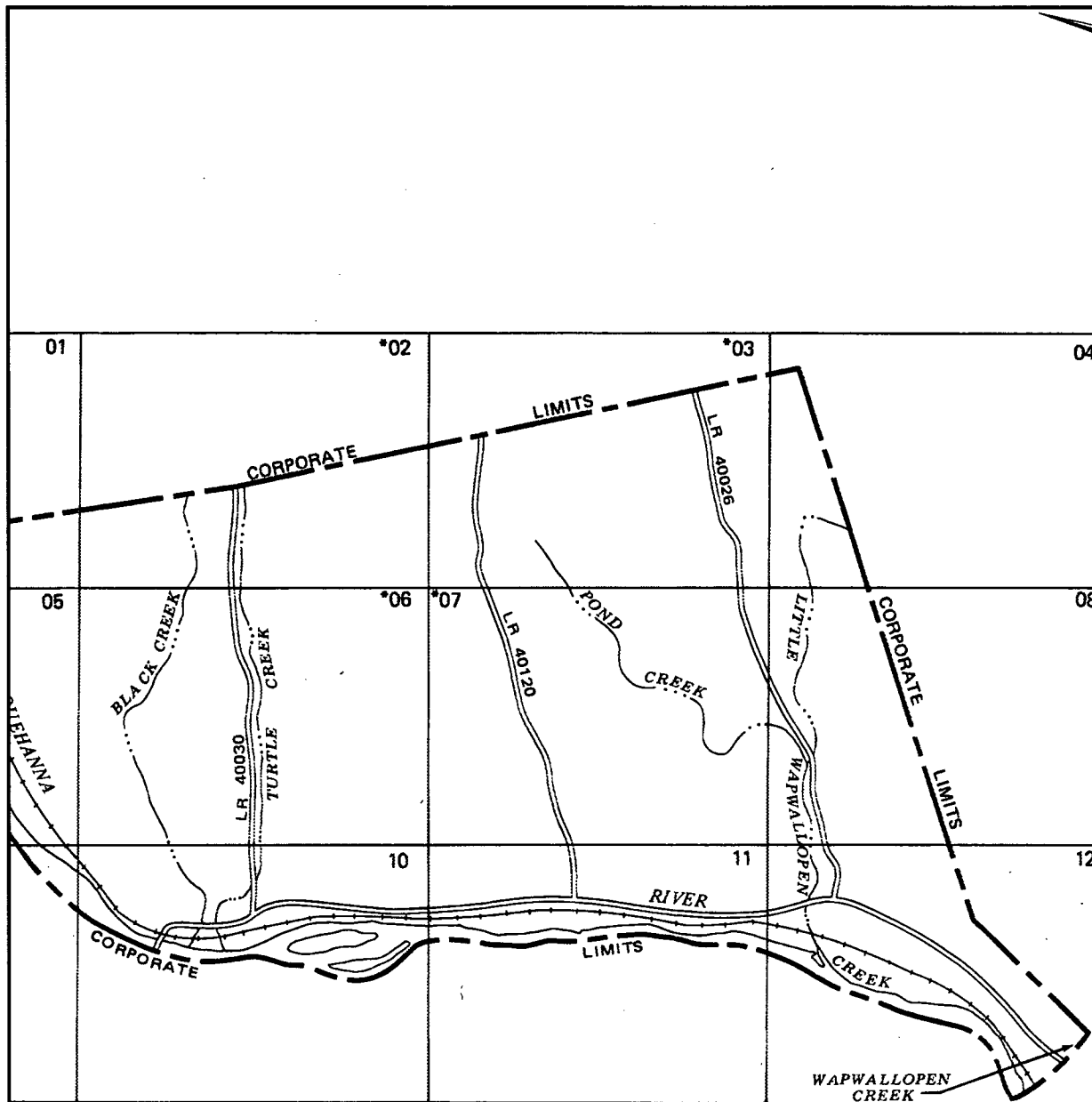
SHEET TITLE:
100 YEAR FLOODPLAIN MAP
FLOOD STUDY - SUSQUEHANNA RIVER
SALEM TOWNSHIP
LUZERNE COUNTY, PENNSYLVANIA

Revision	By	Date	Description
1	11/17/2010	11/17/2010	Initial
2	8/18/11	8/18/2011	Revised

Project Number: E-798-LB
Drawn By: EPJ
Checked By: BE
Date: AUGUST 2011
Scale: 1" = 400'
Drawing Number: E-798-LB-P1
Sheet Number:

1
OF 1

Appendix C:
Annotated FIRM



IN ZONE C
REFERENCE MARKS

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Federal Insurance Administration FLOOD HAZARD BOUNDARY MAP H - 01 - 12 FLOOD INSURANCE RATE MAP I - 01 - 12 MAP INDEX TOWNSHIP OF CONYNNGHAM, PA (LUZERNE CO.) COMMUNITY NO. 420600B		AGENT OF THE COMMUNITY OF MAY CONVI DEPARTMENT F FLOOD HAZ FLOOD INS TOWNSI COI	
ONE DESI DATE OF IG 12/2/74 ase Flood B ase Flood B levation Re iver Mile flood insu ccording to sed by FIA Zone Sym A 1 through AO V B C D CONSULT AGENT OR			

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix D:
Flood Model Summary Table



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Flood Model Summary Table

(all elevations are NGVD 1929)

River Station/ Cross Section	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Δ WSE (ft)	Vel Chnl (ft/s)	Δ V (ft/s)
139600 HEC-2 XS 12, CU	FEMA (FIS)	260000		515.6		N/A	
	Duplicate Effective A (HEC-2)	260000		515.58	0.0	8.12	N/A
	Duplicate Effective B (HEC-RAS)	260000		517.20	1.62	7.62	-0.50
	Corrected Effective	260000		517.70	0.50	7.46	-0.16
	Existing Conditions	260000	481.50	517.79	0.09	7.43	-0.03
	Proposed Conditions	260000	481.50	517.75	-0.04	7.46	0.03
137275 HEC-2 XS 11, CT	FEMA (FIS)	260000		514.6		N/A	
	Duplicate Effective A (HEC-2)	260000		514.58	0.0	8.94	N/A
	Duplicate Effective B (HEC-RAS)	260000		516.13	1.55	8.11	-0.83
	Corrected Effective	260000		516.40	0.27	8.18	0.07
	Existing Conditions	260000	476.20	516.49	0.09	8.14	-0.04
	Proposed Conditions	260000	476.20	516.45	-0.04	8.16	0.02
134600 HEC-2 XS 10, CS	FEMA (FIS)	260000		513.7		N/A	
	Duplicate Effective A (HEC-2)	260000		513.73	0.0	8.28	N/A
	Duplicate Effective B (HEC-RAS)	260000		514.87	1.14	7.98	-0.30
	Corrected Effective	260000		514.87	0.00	8.29	0.31
	Existing Conditions	260000	480.20	514.98	0.11	8.25	-0.04
	Proposed Conditions	260000	480.20	514.94	-0.04	8.26	0.01
133431 (Existing Intake)	Existing Conditions	260000	472.50	514.21		8.90	
	Proposed Conditions	260000	472.50	514.16	-0.05	8.91	0.01
133138 (Proposed Intake)	Existing Conditions	260000	474.40	514.16		8.24	
	Proposed Conditions	260000	474.40	514.15	-0.01	8.12	-0.12
132450 HEC-2 XS 9, CR	FEMA (FIS)	260000		512.9		N/A	
	Duplicate Effective A (HEC-2)	260000		512.85	0.0	8.71	N/A
	Duplicate Effective B (HEC-RAS)	260000		513.77	0.92	8.27	-0.44
	Corrected Effective	260000		513.90	0.13	7.93	-0.34
	Existing Conditions	260000	470.20	513.90	0.00	7.93	0.00
	Proposed Conditions	260000	470.20	513.90	0.00	7.93	0.00
130400 HEC-2 XS 8, CQ	FEMA (FIS)	260000		512.3		N/A	
	Duplicate Effective A (HEC-2)	260000		512.25	0.0	7.92	N/A
	Duplicate Effective B (HEC-RAS)	260000		512.85	0.60	7.64	-0.28
	Corrected Effective	260000		512.97	0.12	7.84	0.20
	Existing Conditions	260000	482.20	512.97	0.00	7.84	0.00
	Proposed Conditions	260000	482.20	512.97	0.00	7.84	0.00
128690 HEC-2 XS 7	FEMA (FIS)	260000		510.7 *		N/A	
	Duplicate Effective A (HEC-2)	260000		510.72	0.0	10.46	N/A
	Duplicate Effective B (HEC-RAS)	260000		511.00	0.28	10.26	-0.20
	Corrected Effective	260000		511.14	0.14	10.17	-0.09
	Existing Conditions	260000	476.20	511.14	0.00	10.17	0.00
	Proposed Conditions	260000	476.20	511.14	0.00	10.17	0.00
127800 HEC-2 XS 6, CP	FEMA (FIS)	260000		510.5		N/A	
	Duplicate Effective A (HEC-2)	260000		510.50	0.00	9.33	N/A
	Duplicate Effective B (HEC-RAS)	260000		510.50	0.00	9.28	-0.05
	Corrected Effective	260000		510.50	0.00	9.69	0.41
	Existing Conditions	260000	476.20	510.50	0.00	9.69	0.00
	Proposed Conditions	260000	476.20	510.50	0.00	9.69	0.00

* XS-7 elevation estimated here, not included in FIS



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Vertical Datum Conversion Table
(100-yr WSE)

River Station/ Cross Section	Plan	NGVD 29 W.S. Elev (ft)	NAVD 88 W.S. Elev (ft)
139600 HEC-2 XS 12, CU	Existing Conditions	517.79	517.09
	Proposed Conditions	517.75	517.05
137275 HEC-2 XS 11, CT	Existing Conditions	516.49	515.79
	Proposed Conditions	516.45	515.75
134600 HEC-2 XS 10, CS	Existing Conditions	514.98	514.28
	Proposed Conditions	514.94	514.24
133431 (Existing Intake)	Existing Conditions	514.21	513.51
	Proposed Conditions	514.16	513.46
133138 (Proposed Intake)	Existing Conditions	514.16	513.46
	Proposed Conditions	514.15	513.45
132450 HEC-2 XS 9, CR	Existing Conditions	513.90	513.20
	Proposed Conditions	513.90	513.20
130400 HEC-2 XS 8, CQ	Existing Conditions	512.97	512.27
	Proposed Conditions	512.97	512.27
128690 HEC-2 XS 7	Existing Conditions	511.14	510.44
	Proposed Conditions	511.14	510.44
127800 HEC-2 XS 6, CP	Existing Conditions	510.50	509.80
	Proposed Conditions	510.50	509.80

Appendix E: Duplicate Effective Model A

- HEC-2 Input Data
- HEC-2 Output Data

SUSQUEHANNA RIVER - INPUT										
T1	SRBC	SHICKSHINNY	PA	SITE	UPDATE	EAA PROJECT NO -16213.02				
T2	SECTIONS 1 THRU 12					AUGUST 11, 2011				
T3	SUSQUEHANNA RIVER					100-YEAR				
J1		4							510.5	
J2	+1.0	0	-1.0			-.80				
J3	38	43	1	8	26	3	51	52	4	39
J3	0	201								
NC	0.1	.060	.040	0.10	0.30					
QT	4	167000	232000	260000	340000					
ET	6					9.1			1074	1957
X1	6	56	1074	1957	1015	960	945			
GR 562.0		0000	559.0	0104	554.9	0200	553.7	0304	549.9	0402
GR 546.8		0505	544.6	0605	543.0	0703	541.2	0753	541.2	0773
GR 539.2		0838	517.5	0877	518.0	0892	518.0	0897	516.1	0906
GR 507.4		0929	504.9	0985	501.0	1020	499.9	1074	487.0	1098
GR 479.7		1115	479.7	1920	487.0	1929	501.4	1957	503.2	2008
GR 505.1		2080	505.1	2105	505.1	2116	504.4	2167	504.8	2188
GR 506.2		2242	504.9	2272	495.2	2297	492.3	2339	495.2	2391
GR 503.6		2439	506.0	2510	505.0	2582	504.2	2601	510.5	2629
GR 510.5		2642	504.7	2654	504.7	2687	510.9	2710	512.1	2760
GR 520.0		2787	520.7	2803	520.7	2808	520.1	2819	530.1	2843
GR 542.4		2894	554.8	2958	560.7	3032	566.9	3131	570.2	3221
GR 575.0		3274								
NC		.070								
ET	7					9.1			852	1713
X1	7	83	852	1713	970	900	890			
GR 575.0		0000	571.1	0060	568.2	0110	554.9	0196	555.6	0217
GR 553.2		0234	550.7	0272	550.7	0284	549.1	0355	547.2	0435
GR 543.6		0499	542.1	0563	542.1	0577	540.2	0629	538.8	0724
GR 536.1		0750	536.1	0769	536.2	0793	517.0	0823	517.0	0831
GR 516.1		0852	487.1	0923	480.7	0940	480.7	1659	487.1	1670
GR 501.4		1713	506.0	1787	505.8	1841	505.8	1857	505.1	1913
GR 505.1		1935	506.3	1994	508.1	2062	508.1	2090	507.2	2160
GR 506.6		2253	505.9	2348	503.0	2414	500.8	2422	500.8	2461
GR 503.8		2487	504.8	2547	504.8	2568	501.2	2594	499.9	2676
GR 501.1		2709	507.0	2732	506.3	2790	510.7	2839	510.7	2866
GR 509.9		2879	504.8	2892	504.8	2926	511.1	2943	517.2	2973
GR 517.2		2993	519.9	3002	520.5	3014	520.5	3023	520.0	3033
GR 527.2		3063	535.0	3141	542.1	3232	547.3	3303	550.8	3402
GR 553.2		3481	557.1	3558	559.8	3603	565.8	3703	566.7	3784
GR 566.0		3825	566.3	3852	567.3	3882	567.0	3940	566.3	4007
GR 565.8		4047	565.5	4076	564.3	4115	563.8	4124	565.2	4166
GR 558.1		4273	550.4	4382	575.0	4477				
NC	.080	.080								
ET	8					9.1			1418	2483
X1	8	90	1418	2483	2400	1120	1705			
GR 575.0		0000	555.6	0101	541.2	0198	532.5	0289	525.5	0371
GR 527.0		0385	527.0	0419	524.6	0441	518.0	0534	514.3	0614
GR 509.8		0697	506.1	0775	504.0	0807	508.3	0849	510.8	0940
GR 516.4		1007	513.5	1019	516.4	1037	516.4	1046	516.4	1055
GR 502.3		1090	499.3	1172	491.1	1209	502.3	1288	506.2	1355
GR 499.9		1418	488.0	1443	487.3	1514	487.2	1557	482.0	1600
GR 482.0		2430	487.2	2443	500.9	2483	504.9	2552	506.2	2642
GR 508.5		2693	508.5	2706	508.0	2753	508.4	2817	508.1	2897
GR 508.1		2985	507.9	3059	507.2	3132	505.1	3160	506.7	3225
GR 507.0		3304	504.7	3367	504.7	3434	505.2	3464	509.5	3486
GR 504.9		3500	504.9	3542	511.1	3559	505.1	3570	504.9	3580
GR 504.9		3629	505.1	3692	506.6	3775	507.0	3832	519.0	3890
GR 519.5		3905	519.5	3908	519.5	3911	519.0	3922	516.0	3943
GR 520.1		3993	520.9	4056	525.0	4128	525.7	4189	526.3	4233
GR 528.2		4302	530.0	4353	530.0	4392	531.9	4457	535.1	4532
GR 542.6		4559	543.5	4573	543.5	4612	543.2	4620	541.1	4687
GR 545.8		4730	560.0	4771	563.2	4827	564.0	4855	564.0	4871

SUSQUEHANNA RIVER - INPUT									
GR 564.2	4914	564.2	4962	562.1	5028	563.4	5074	575.0	5110
ET 9					9.1			1758	2869
X1 9	86	1921	2869	2030	1650	2050			
GR 575.0	0000	553.9	0056	553.9	0072	544.9	0107	531.8	0190
GR 522.2	0263	518.7	0331	514.0	0404	509.6	0451	509.6	0526
GR 509.6	0595	514.9	0625	518.8	0686	520.6	0743	529.0	0821
GR 530.9	0892	531.8	0979	531.7	1003	516.4	1045	516.9	1052
GR 516.9	1053	516.9	1057	515.2	1074	503.1	1103	501.9	1146
GR 501.9	1210	503.5	1244	503.4	1324	504.9	1410	504.9	1513
GR 503.0	1548	504.7	1602	505.2	1661	505.2	1712	504.0	1794
GR 502.2	1856	505.5	1921	503.2	1950	487.5	1978	481.4	1988
GR 481.1	2798	487.5	2816	507.6	2869	507.6	2956	509.8	3016
GR 506.5	3089	505.7	3175	506.8	3264	506.2	3321	505.1	3387
GR 511.8	3395	511.8	3402	504.9	3421	504.9	3451	510.0	3472
GR 512.1	3541	512.2	3637	511.5	3716	513.3	3819	517.5	3918
GR 520.4	3964	520.0	3975	520.7	3981	520.7	3983	520.7	3987
GR 520.4	3996	521.4	4026	524.9	4107	526.9	4175	527.5	4213
GR 527.5	4223	530.8	4305	534.2	4377	537.0	4473	540.1	4535
GR 541.9	4547	541.9	4584	541.0	4596	544.1	4602	546.6	4648
GR 556.2	4740	565.0	4831	570.9	4862	573.5	4908	573.5	4923
GR 575.0	4933								
NC .060	.060								
ET 10					9.1			2139	3228
X1 10	86	2278	3228	2075	2160	2125			
GR 575.0	0000	571.9	0049	570.1	0102	562.3	0168	540.0	0251
GR 540.0	0266	531.1	0335	522.3	0421	516.0	0493	510.8	0554
GR 510.5	0592	510.5	0605	510.9	0679	513.1	0770	512.9	0868
GR 513.3	0969	513.3	1056	513.1	1157	512.1	1228	511.4	1248
GR 511.4	1264	512.9	1282	512.4	1339	515.1	1356	515.5	1362
GR 515.1	1370	514.8	1395	510.3	1406	509.1	1489	508.0	1576
GR 506.2	1679	506.2	1720	506.1	1826	508.1	1946	505.9	2005
GR 504.8	2073	501.1	2140	500.9	2200	500.7	2278	493.7	2301
GR 487.7	2348	480.0	2489	480.0	3141	487.7	3174	517.0	3228
GR 517.9	3247	517.9	3255	517.7	3323	517.5	3401	516.4	3492
GR 516.0	3602	512.9	3701	510.1	3806	507.3	3870	505.4	3951
GR 504.0	3990	504.0	4013	505.2	4034	512.1	4041	512.1	4049
GR 504.9	4064	504.9	4089	513.9	4110	513.9	4115	512.5	4123
GR 512.5	4529	516.6	4541	515.1	4555	517.5	4567	518.0	4572
GR 517.5	4580	513.1	4594	515.8	4602	513.2	4618	522.6	4660
GR 525.4	4698	525.6	4700	525.6	4737	525.1	4761	522.9	4819
GR 530.9	4881	544.1	4943	547.5	4985	550.1	5023	563.2	5096
GR 575.0	5162								
ET 11					7.1	777	1625		
X1 11	62	777	1622	2785	2485	2690			
GR 575.0	0000	556.1	0076	523.0	0160	512.0	0208	504.5	0278
GR 504.5	0293	515.5	0341	515.5	0352	515.9	0366	515.9	0387
GR 510.2	0416	510.9	0495	510.5	0580	512.1	0663	513.3	0739
GR 510.2	0777	503.0	0802	502.4	0812	488.0	0848	480.6	0864
GR 480.6	1555	488.0	1579	499.7	1622	501.2	1683	509.2	1725
GR 507.8	1797	509.8	1882	504.5	1951	504.8	2036	506.5	2127
GR 509.2	2239	513.7	2339	510.2	2460	510.7	2537	510.3	2635
GR 508.4	2727	508.8	2824	508.9	2902	511.0	2989	507.9	3058
GR 509.3	3124	504.9	3141	504.9	3169	509.5	3182	509.0	3210
GR 508.5	3282	513.9	3298	509.7	3314	509.7	3552	513.5	3589
GR 514.5	3597	513.5	3600	512.0	3614	518.0	3651	517.9	3656
GR 517.2	3700	518.7	3731	520.8	3801	525.1	3867	540.0	3911
GR 540.0	3924	575.0	4010						
NH 5	.080	106	.040	640	.055	754	.040	1118	.060
NH 3289									
ET 12					7.1	106	1118		
X1 12	51	106	1118	2375	2065	2340			
GR 575.0	0000	521.0	0042	522.1	0060	522.1	0072	522.7	0083
GR 522.7	0089	521.0	0106	481.5	0176	481.5	0180	481.5	0640

SUSQUEHANNA RIVER - INPUT									
GR 506.2	0678	481.5	0754	481.5	1040	511.2	1118	510.5	1190
GR 509.9	1274	509.9	1357	508.2	1464	507.0	1545	510.1	1627
GR 510.8	1697	509.2	1758	511.3	1824	511.3	1914	510.2	1999
GR 508.7	2029	512.0	2081	514.2	2127	507.0	2166	507.0	2212
GR 514.2	2239	515.4	2331	517.0	2417	517.0	2519	516.7	2566
GR 518.6	2575	518.6	2584	517.0	2604	518.2	2676	521.1	2771
GR 524.8	2844	532.0	2876	532.0	2889	532.0	2926	530.2	2945
GR 533.3	2947	536.2	3011	539.0	3058	552.7	3123	559.1	3196
GR 600.0	3289								
EJ									
ER									

SUSQUEHANNA RIVER - OUTPUT

1*****
 * HEC-2 WATER SURFACE PROFILES *
 * *
 * Version 4.6.2; May 1991 *
 * *
 * RUN DATE 11AUG11 TIME 15:49:00 *

 * U.S. ARMY CORPS OF ENGINEERS *
 * HYDROLOGIC ENGINEERING CENTER *
 * 609 SECOND STREET, SUITE D *
 * DAVIS, CALIFORNIA 95616-4687 *
 * (916) 756-1104 *

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X      X  XXXXXXXX  XXXXX
X      X  X        X      X
X      X  X        X      X
XXXXXXX XXXX      X      XXXXX
X      X  X        X      X
X      X  X        X      X
X      X  XXXXXXXX  XXXXX
  
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PAGE 1

 HEC-2 WATER SURFACE PROFILES
 Version 4.6.2; May 1991

THIS RUN EXECUTED 11AUG11 15:49:00

T1 SRBC SHICKSHINNY PA SITE UPDATE EAA PROJECT NO 16213.02
 T2 SECTIONS 1 THRU 12 AUGUST 11, 2011
 T3 SUSQUEHANNA RIVER 100-YEAR

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		4							510.5	
J2	NPROF	IPLLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	+1.0	0	-1.0			-0.80				

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	43	1	8	26	3	51	52	4	39
0	201								
NC	0.1	.060	.040	0.10	0.30				
QT	4	167000	232000	260000	340000				

SUSQUEHANNA RIVER - OUTPUT

ET	6					9.1			1074	1957
X1	6	56	1074	1957	1015	960	945			
GR	562.0	0000	559.0	0104	554.9	0200	553.7	0304	549.9	0402
GR	546.8	0505	544.6	0605	543.0	0703	541.2	0753	541.2	0773
GR	539.2	0838	517.5	0877	518.0	0892	518.0	0897	516.1	0906
GR	507.4	0929	504.9	0985	501.0	1020	499.9	1074	487.0	1098
GR	479.7	1115	479.7	1920	487.0	1929	501.4	1957	503.2	2008
GR	505.1	2080	505.1	2105	505.1	2116	504.4	2167	504.8	2188
GR	506.2	2242	504.9	2272	495.2	2297	492.3	2339	495.2	2391
GR	503.6	2439	506.0	2510	505.0	2582	504.2	2601	510.5	2629
GR	510.5	2642	504.7	2654	504.7	2687	510.9	2710	512.1	2760
GR	520.0	2787	520.7	2803	520.7	2808	520.1	2819	530.1	2843
GR	542.4	2894	554.8	2958	560.7	3032	566.9	3131	570.2	3221
GR	575.0	3274								

NC		.070				9.1			852	1713
ET	7					900	890			
X1	7	83	852	1713	970	900	890			
GR	575.0	0000	571.1	0060	568.2	0110	554.9	0196	555.6	0217
GR	553.2	0234	550.7	0272	550.7	0284	549.1	0355	547.2	0435
GR	543.6	0499	542.1	0563	542.1	0577	540.2	0629	538.8	0724
GR	536.1	0750	536.1	0769	536.2	0793	517.0	0823	517.0	0831
GR	516.1	0852	487.1	0923	480.7	0940	480.7	1659	487.1	1670
GR	501.4	1713	506.0	1787	505.8	1841	505.8	1857	505.1	1913
GR	505.1	1935	506.3	1994	508.1	2062	508.1	2090	507.2	2160

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PAGE 2

GR	506.6	2253	505.9	2348	503.0	2414	500.8	2422	500.8	2461
GR	503.8	2487	504.8	2547	504.8	2568	501.2	2594	499.9	2676
GR	501.1	2709	507.0	2732	506.3	2790	510.7	2839	510.7	2866
GR	509.9	2879	504.8	2892	504.8	2926	511.1	2943	517.2	2973
GR	517.2	2993	519.9	3002	520.5	3014	520.5	3023	520.0	3033
GR	527.2	3063	535.0	3141	542.1	3232	547.3	3303	550.8	3402
GR	553.2	3481	557.1	3558	559.8	3603	565.8	3703	566.7	3784
GR	566.0	3825	566.3	3852	567.3	3882	567.0	3940	566.3	4007
GR	565.8	4047	565.5	4076	564.3	4115	563.8	4124	565.2	4166
GR	558.1	4273	550.4	4382	575.0	4477				

NC	.080	.080				9.1			1418	2483
ET	8					1120	1705			
X1	8	90	1418	2483	2400	1120	1705			
GR	575.0	0000	555.6	0101	541.2	0198	532.5	0289	525.5	0371
GR	527.0	0385	527.0	0419	524.6	0441	518.0	0534	514.3	0614
GR	509.8	0697	506.1	0775	504.0	0807	508.3	0849	510.8	0940
GR	516.4	1007	513.5	1019	516.4	1037	516.4	1046	516.4	1055
GR	502.3	1090	499.3	1172	491.1	1209	502.3	1288	506.2	1355
GR	499.9	1418	488.0	1443	487.3	1514	487.2	1557	482.0	1600
GR	482.0	2430	487.2	2443	500.9	2483	504.9	2552	506.2	2642
GR	508.5	2693	508.5	2706	508.0	2753	508.4	2817	508.1	2897
GR	508.1	2985	507.9	3059	507.2	3132	505.1	3160	506.7	3225
GR	507.0	3304	504.7	3367	504.7	3434	505.2	3464	509.5	3486
GR	504.9	3500	504.9	3542	511.1	3559	505.1	3570	504.9	3580
GR	504.9	3629	505.1	3692	506.6	3775	507.0	3832	519.0	3890

SUSQUEHANNA RIVER - OUTPUT

GR	519.5	3905	519.5	3908	519.5	3911	519.0	3922	516.0	3943
GR	520.1	3993	520.9	4056	525.0	4128	525.7	4189	526.3	4233
GR	528.2	4302	530.0	4353	530.0	4392	531.9	4457	535.1	4532
GR	542.6	4559	543.5	4573	543.5	4612	543.2	4620	541.1	4687
GR	545.8	4730	560.0	4771	563.2	4827	564.0	4855	564.0	4871
GR	564.2	4914	564.2	4962	562.1	5028	563.4	5074	575.0	5110

ET	9					9.1			1758	2869
X1	9	86	1921	2869	2030	1650	2050			
GR	575.0	0000	553.9	0056	553.9	0072	544.9	0107	531.8	0190
GR	522.2	0263	518.7	0331	514.0	0404	509.6	0451	509.6	0526
GR	509.6	0595	514.9	0625	518.8	0686	520.6	0743	529.0	0821
GR	530.9	0892	531.8	0979	531.7	1003	516.4	1045	516.9	1052
GR	516.9	1053	516.9	1057	515.2	1074	503.1	1103	501.9	1146
GR	501.9	1210	503.5	1244	503.4	1324	504.9	1410	504.9	1513
GR	503.0	1548	504.7	1602	505.2	1661	505.2	1712	504.0	1794
GR	502.2	1856	505.5	1921	503.2	1950	487.5	1978	481.4	1988
GR	481.1	2798	487.5	2816	507.6	2869	507.6	2956	509.8	3016
GR	506.5	3089	505.7	3175	506.8	3264	506.2	3321	505.1	3387
GR	511.8	3395	511.8	3402	504.9	3421	504.9	3451	510.0	3472
GR	512.1	3541	512.2	3637	511.5	3716	513.3	3819	517.5	3918
GR	520.4	3964	520.0	3975	520.7	3981	520.7	3983	520.7	3987
GR	520.4	3996	521.4	4026	524.9	4107	526.9	4175	527.5	4213
GR	527.5	4223	530.8	4305	534.2	4377	537.0	4473	540.1	4535
GR	541.9	4547	541.9	4584	541.0	4596	544.1	4602	546.6	4648
GR	556.2	4740	565.0	4831	570.9	4862	573.5	4908	573.5	4923
GR	575.0	4933								

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PAGE 3

NC	.060	.060								
ET	10					9.1			2139	3228
X1	10	86	2278	3228	2075	2160	2125			
GR	575.0	0000	571.9	0049	570.1	0102	562.3	0168	540.0	0251
GR	540.0	0266	531.1	0335	522.3	0421	516.0	0493	510.8	0554
GR	510.5	0592	510.5	0605	510.9	0679	513.1	0770	512.9	0868
GR	513.3	0969	513.3	1056	513.1	1157	512.1	1228	511.4	1248
GR	511.4	1264	512.9	1282	512.4	1339	515.1	1356	515.5	1362
GR	515.1	1370	514.8	1395	510.3	1406	509.1	1489	508.0	1576
GR	506.2	1679	506.2	1720	506.1	1826	508.1	1946	505.9	2005
GR	504.8	2073	501.1	2140	500.9	2200	500.7	2278	493.7	2301
GR	487.7	2348	480.0	2489	480.0	3141	487.7	3174	517.0	3228
GR	517.9	3247	517.9	3255	517.7	3323	517.5	3401	516.4	3492
GR	516.0	3602	512.9	3701	510.1	3806	507.3	3870	505.4	3951
GR	504.0	3990	504.0	4013	505.2	4034	512.1	4041	512.1	4049
GR	504.9	4064	504.9	4089	513.9	4110	513.9	4115	512.5	4123
GR	512.5	4529	516.6	4541	515.1	4555	517.5	4567	518.0	4572
GR	517.5	4580	513.1	4594	515.8	4602	513.2	4618	522.6	4660
GR	525.4	4698	525.6	4700	525.6	4737	525.1	4761	522.9	4819
GR	530.9	4881	544.1	4943	547.5	4985	550.1	5023	563.2	5096
GR	575.0	5162								

ET 11

7.1

777

1625

SUSQUEHANNA RIVER - OUTPUT

X1	11	62	777	1622	2785	2485	2690			
GR	575.0	0000	556.1	0076	523.0	0160	512.0	0208	504.5	0278
GR	504.5	0293	515.5	0341	515.5	0352	515.9	0366	515.9	0387
GR	510.2	0416	510.9	0495	510.5	0580	512.1	0663	513.3	0739
GR	510.2	0777	503.0	0802	502.4	0812	488.0	0848	480.6	0864
GR	480.6	1555	488.0	1579	499.7	1622	501.2	1683	509.2	1725
GR	507.8	1797	509.8	1882	504.5	1951	504.8	2036	506.5	2127
GR	509.2	2239	513.7	2339	510.2	2460	510.7	2537	510.3	2635
GR	508.4	2727	508.8	2824	508.9	2902	511.0	2989	507.9	3058
GR	509.3	3124	504.9	3141	504.9	3169	509.5	3182	509.0	3210
GR	508.5	3282	513.9	3298	509.7	3314	509.7	3552	513.5	3589
GR	514.5	3597	513.5	3600	512.0	3614	518.0	3651	517.9	3656
GR	517.2	3700	518.7	3731	520.8	3801	525.1	3867	540.0	3911
GR	540.0	3924	575.0	4010						
NH	5	.080	106	.040	640	.055	754	.040	1118	.060
NH	3289									
ET	12					7.1	106	1118		
X1	12	51	106	1118	2375	2065	2340			
GR	575.0	0000	521.0	0042	522.1	0060	522.1	0072	522.7	0083
GR	522.7	0089	521.0	0106	481.5	0176	481.5	0180	481.5	0640
GR	506.2	0678	481.5	0754	481.5	1040	511.2	1118	510.5	1190
GR	509.9	1274	509.9	1357	508.2	1464	507.0	1545	510.1	1627
GR	510.8	1697	509.2	1758	511.3	1824	511.3	1914	510.2	1999
GR	508.7	2029	512.0	2081	514.2	2127	507.0	2166	507.0	2212
GR	514.2	2239	515.4	2331	517.0	2417	517.0	2519	516.7	2566
GR	518.6	2575	518.6	2584	517.0	2604	518.2	2676	521.1	2771
GR	524.8	2844	532.0	2876	532.0	2889	532.0	2926	530.2	2945
GR	533.3	2947	536.2	3011	539.0	3058	552.7	3123	559.1	3196
GR	600.0	3289								

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PAGE 4

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

0

CCHV= .100 CEHV= .300
*SECNO 6.000

3265 DIVIDED FLOW

6.000	30.80	510.50	.00	510.50	511.78	1.28	.00	.00	499.90
260000.0	1315.2	246044.9	12639.9	1063.3	26365.5	5527.6	.0	.0	501.40
.00	1.24	9.33	2.29	.100	.032	.060	.000	479.70	920.80
.000443	1015.	945.	960.	0	0	0	.00	1774.71	2708.52

*SECNO 7.000

SUSQUEHANNA RIVER - OUTPUT									
7.000	30.02	510.72	.00	.00	512.34	1.62	.46	.10	516.10
260000.0	.0	248098.0	11902.1	.0	23728.1	6651.5	649.4	39.7	501.40
.02	.00	10.46	1.79	.000	.032	.070	.000	480.70	865.17
.000606	970.	890.	900.	2	0	0	.00	2076.81	2941.98

*SECNO 8.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

8.000	30.25	512.25	.00	.00	513.16	.91	.74	.07	499.90
260000.0	8340.1	242799.4	8860.5	5170.3	30659.7	7873.7	2043.0	128.7	500.90
.09	1.61	7.92	1.13	.080	.032	.080	.000	482.00	651.87
.000332	2400.	1705.	1120.	2	0	0	.00	3097.49	3857.36

*SECNO 9.000

3265 DIVIDED FLOW

9.000	31.75	512.85	.00	.00	513.95	1.10	.73	.06	505.50
260000.0	12228.3	243327.8	4443.8	7993.4	27937.1	3852.3	3950.6	259.2	507.60
.16	1.53	8.71	1.15	.080	.032	.080	.000	481.10	416.33
.000392	2030.	2050.	1650.	2	0	0	.00	2910.39	3793.00

1

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK	ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

*SECNO 10.000

3265 DIVIDED FLOW

10.000	33.73	513.73	.00	.00	514.72	.99	.76	.01	500.70
260000.0	13637.0	242280.3	4082.7	7921.0	29277.7	2879.7	5892.1	415.0	517.00
.23	1.72	8.28	1.42	.060	.032	.060	.000	480.00	519.63
.000330	2075.	2125.	2160.	2	0	0	.00	3513.31	4620.37

*SECNO 11.000

3265 DIVIDED FLOW

11.000	33.98	514.58	.00	.00	515.71	1.14	.95	.04	510.20
260000.0	2693.7	237639.0	19667.3	2047.7	26594.8	11593.4	8348.8	623.4	499.70

				SUSQUEHANNA RIVER - OUTPUT						
.32	1.32	8.94	1.70	.060	.032	.060	.000	480.60	196.76	
.000377	2785.	2690.	2485.	2	0	0	.00	3376.35	3629.88	

1490 NH CARD USED

*SECNO 12.000

12.000	34.08	515.58	.00	.00	516.56	.98	.83	.02	521.00	
260000.0	.0	248251.9	11748.1	.0	30562.0	6393.1	10366.2	763.9	511.20	
.40	.00	8.12	1.84	.000	.032	.048	.000	481.50	115.61	
.000337	2375.	2340.	2065.	2	0	0	.00	2224.83	2340.44	

1

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THIS RUN EXECUTED 11AUG11 15:49:00

HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SUSQUEHANNA RIVER 1

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VCH	EG	DIFWSX	DIFKWS	TOPWID	XLCH
6.000	260000.00	510.50	30.80	9.33	511.78	.00	.00	1774.71	.00
7.000	260000.00	510.72	30.02	10.46	512.34	.22	.00	2076.81	890.00
8.000	260000.00	512.25	30.25	7.92	513.16	1.52	.00	3097.49	1705.00
9.000	260000.00	512.85	31.75	8.71	513.95	.60	.00	2910.39	2050.00
10.000	260000.00	513.73	33.73	8.28	514.72	.88	.00	3513.31	2125.00
11.000	260000.00	514.58	33.98	8.94	515.71	.85	.00	3376.35	2690.00
12.000	260000.00	515.58	34.08	8.12	516.56	1.00	.00	2224.83	2340.00

1

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SUSQUEHANNA RIVER - OUTPUT

SUMMARY OF ERRORS AND SPECIAL NOTES

1

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FLOOD INSURANCE ZONE DATA FOR SUSQUEHANNA RIVER 1

FLOOD HAZARD FACTOR FOR ENTIRE REACH USING SECTIONS

SECTION NUMBER	CUMULATIVE DISTANCE	ELEVATION DIFFERENCE BETWEEN BASE FLOOD AND		
		10	2	0.2
6.000	0.	510.50	.00	.00
7.000	890.	510.72	.00	.00
8.000	2595.	512.25	.00	.00
9.000	4645.	512.85	.00	.00
10.000	6770.	513.73	.00	.00
11.000	9460.	514.58	.00	.00
12.000	11800.	515.58	.00	.00

WEIGHTED AVG FOR REACH		513.24	.00	.00

FHF FOR THE REACH = 005 WITH 18.0 PERCENT OF THE REACH WITHIN .5 FEET
ZONE FOR THE REACH = A 1

CONTINUOUS FLOOD HAZARD FACTORS BY EVEN INCREMENTS

INC NO.	TOTAL LENGTH	AVG ELEVATION DATA	WTD. AVG.	FHF	PERCENT WITHIN
		10 1 DIFF.			
	0.			SEC.	6.000
1	890.	510.61 .00 510.61	510.61	005	100.
	890.			SEC.	7.000
2	1780.	511.12 .00 511.12	510.86	005	100.
	2595.			SEC.	8.000
3	2670.	511.89 .00 511.89	511.21	005	33.
4	3560.	512.40 .00 512.40	511.51	005	50.
5	4450.	512.66 .00 512.66	511.74	005	20.
	4645.			SEC.	9.000
6	5340.	512.96 .00 512.96	511.94	005	33.
7	6230.	513.32 .00 513.32	512.14	005	29.
	6770.			SEC.	10.000
8	7120.	513.67 .00 513.67	512.33	005	38.

SUSQUEHANNA RIVER - OUTPUT

9	8010.	513.98	.00	513.98	512.51	005	33.
10	8900.	514.26	.00	514.26	512.69	005	30.
	9460.				SEC.	11.000	
11	9790.	514.56	.00	514.56	512.86	005	36.
12	10680.	514.91	.00	514.91	513.03	005	25.
13	11570.	515.29	.00	515.29	513.20	005	23.
	11800.				SEC.	12.000	

1

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THIS REACH CAN BE SUBDIVIDED BY INC NO. TO MEET FIA REQUIREMENTS
 INPUT 20N WHERE N IS THE NUMBER OF REACHES AND THEN INPUT THE END
 OF EACH REACH BY INC NO. FOR EXAMPLE 202 2 13
 A NEGATIVE INC NO. WILL SUPPRESS INTERMEDIATE INC OUTPUT.

CONTINUOUS FLOOD HAZARD FACTORS BY EVEN INCREMENTS

INC NO.	TOTAL LENGTH	WEIGHTED AVG DIFFERENCE BETWEEN BASE FLOOD AND	10	2	0.2
---------	--------------	--	----	---	-----

2	1780.	510.86	.00	.00	
---	-------	--------	-----	-----	--

FHF FOR REACH 1 = 005 WITH 100. PERCENT OF THE REACH WITHIN .5 FEET
 ZONE FOR THE REACH = A 1

5	4450.	512.32	.00	.00	
---	-------	--------	-----	-----	--

FHF FOR REACH 2 = 005 WITH 100. PERCENT OF THE REACH WITHIN .5 FEET
 ZONE FOR THE REACH = A 1

8	7120.	513.32	.00	.00	
---	-------	--------	-----	-----	--

FHF FOR REACH 3 = 005 WITH 100. PERCENT OF THE REACH WITHIN .5 FEET
 ZONE FOR THE REACH = A 1

12	10680.	514.43	.00	.00	
----	--------	--------	-----	-----	--

FHF FOR REACH 4 = 005 WITH 100. PERCENT OF THE REACH WITHIN .5 FEET
 ZONE FOR THE REACH = A 1

13	11570.	515.29	.00	.00	
----	--------	--------	-----	-----	--

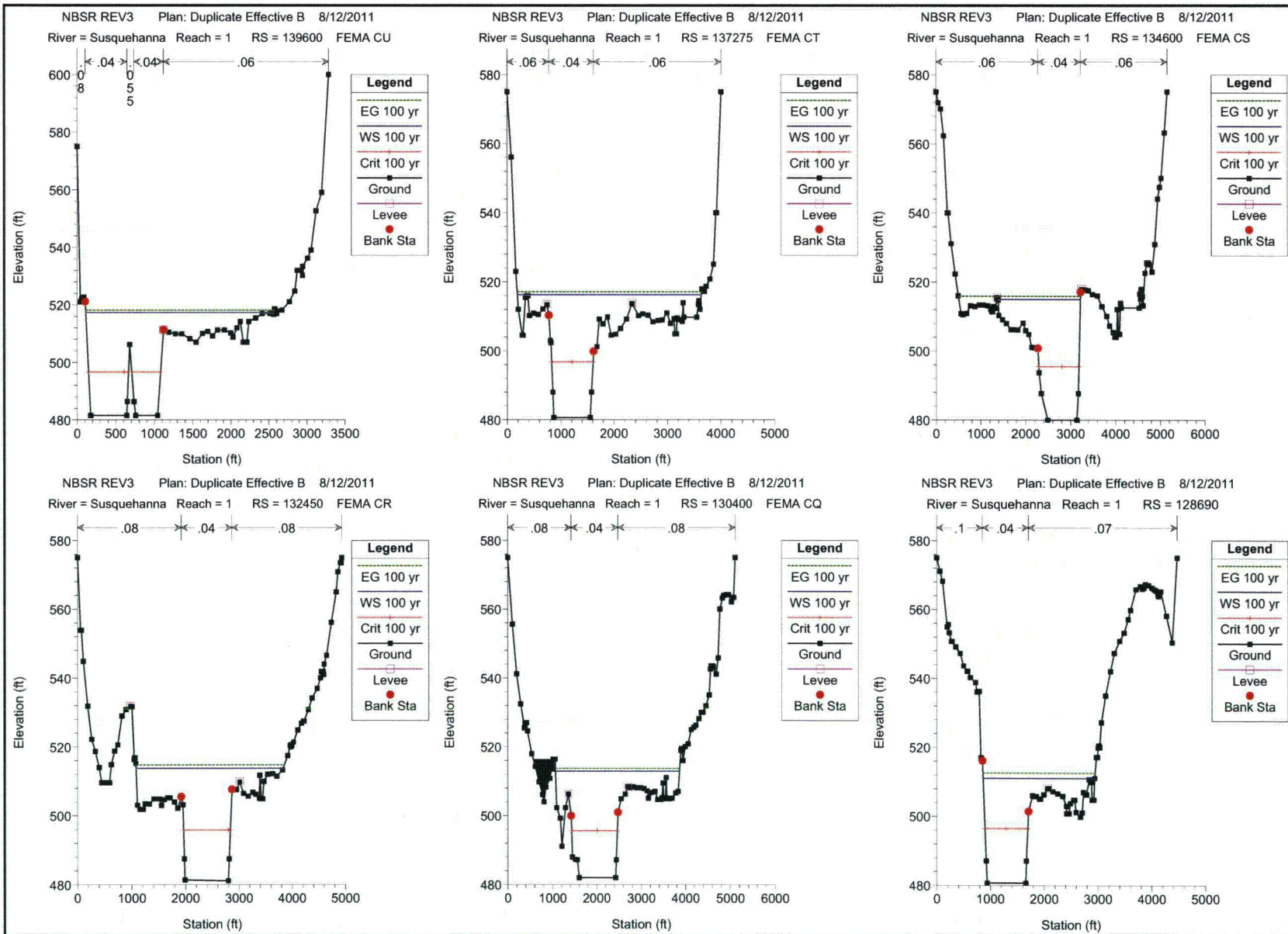
FHF FOR REACH 5 = 005 WITH 100. PERCENT OF THE REACH WITHIN .5 FEET
 ZONE FOR THE REACH = A 1

Appendix F:
Duplicate Effective Model B

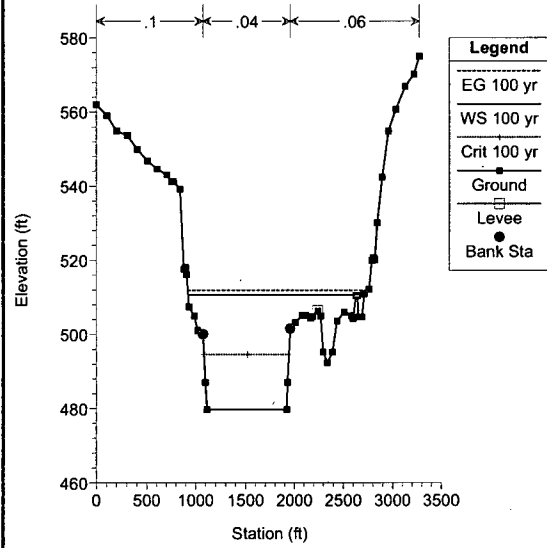
- HEC-RAS Reports
- HEC-RAS Cross-Sections
- HEC-RAS Profiles

HEC-RAS Plan: Dupl. EffectiveB River: Susquehanna Reach: 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	139600	10 yr	167000.00	481.50	511.07	492.75	511.70	0.000387	6.39	26130.95	994.06	0.22
1	139600	50 yr	232000.00	481.50	515.53	495.43	516.32	0.000416	7.27	36915.58	2222.13	0.23
1	139600	100 yr	260000.00	481.50	517.20	496.49	518.05	0.000429	7.62	40736.70	2455.61	0.24
1	139600	500 yr	340000.00	481.50	521.44	499.31	522.42	0.000444	8.36	51651.41	2683.56	0.25
1	137275	10 yr	167000.00	480.60	509.87	492.62	510.68	0.000482	7.26	24832.17	1475.85	0.25
1	137275	50 yr	232000.00	480.60	514.38	495.50	515.28	0.000471	7.96	39587.07	3371.22	0.25
1	137275	100 yr	260000.00	480.60	516.13	496.64	517.02	0.000456	8.11	45511.95	3449.45	0.25
1	137275	500 yr	340000.00	480.60	520.50	499.71	521.40	0.000422	8.48	60960.07	3620.12	0.24
1	134600	10 yr	167000.00	480.00	508.76	491.71	509.44	0.000416	6.67	27196.79	1696.99	0.23
1	134600	50 yr	232000.00	480.00	513.17	494.35	514.03	0.000449	7.63	35114.02	1821.97	0.24
1	134600	100 yr	260000.00	480.00	514.87	495.40	515.79	0.000459	7.98	38207.27	1834.66	0.25
1	134600	500 yr	340000.00	480.00	519.42	498.16	520.29	0.000402	8.14	62114.85	4191.91	0.24
1	132450	10 yr	167000.00	481.10	507.67	492.11	508.44	0.000529	7.11	26147.60	1865.76	0.25
1	132450	50 yr	232000.00	481.10	512.07	494.73	512.99	0.000531	7.96	37152.01	2555.50	0.26
1	132450	100 yr	260000.00	481.10	513.77	495.80	514.74	0.000530	8.27	41752.06	2752.58	0.26
1	132450	500 yr	340000.00	481.10	518.23	498.59	519.31	0.000514	8.92	54331.59	2889.54	0.27
1	130400	10 yr	167000.00	482.00	506.70	492.33	507.37	0.000482	6.62	27244.70	1574.11	0.24
1	130400	50 yr	232000.00	482.00	511.13	494.66	511.93	0.000477	7.39	39455.45	2783.88	0.25
1	130400	100 yr	260000.00	482.00	512.85	495.58	513.69	0.000470	7.64	44252.76	2796.46	0.25
1	130400	500 yr	340000.00	482.00	517.31	498.08	518.28	0.000467	8.37	57278.68	3358.23	0.25
1	128690	10 yr	167000.00	480.70	505.02	492.46	506.22	0.000888	8.82	19037.51	892.08	0.33
1	128690	50 yr	232000.00	480.70	509.29	495.28	510.77	0.000911	9.93	27482.55	2012.27	0.34
1	128690	100 yr	260000.00	480.70	511.00	496.42	512.55	0.000901	10.26	30951.43	2078.23	0.34
1	128690	500 yr	340000.00	480.70	515.53	499.40	517.19	0.000850	10.91	40441.86	2111.38	0.34
1	127800	10 yr	167000.00	479.70	504.50	490.62	505.47	0.000671	7.91	21486.01	1081.21	0.29
1	127800	50 yr	232000.00	479.70	508.80	493.29	509.99	0.000684	8.92	29957.90	1752.84	0.30
1	127800	100 yr	260000.00	479.70	510.50	494.35	511.76	0.000685	9.28	32956.34	1774.71	0.30
1	127800	500 yr	340000.00	479.70	515.00	497.18	516.46	0.000677	10.13	41223.56	1861.00	0.30

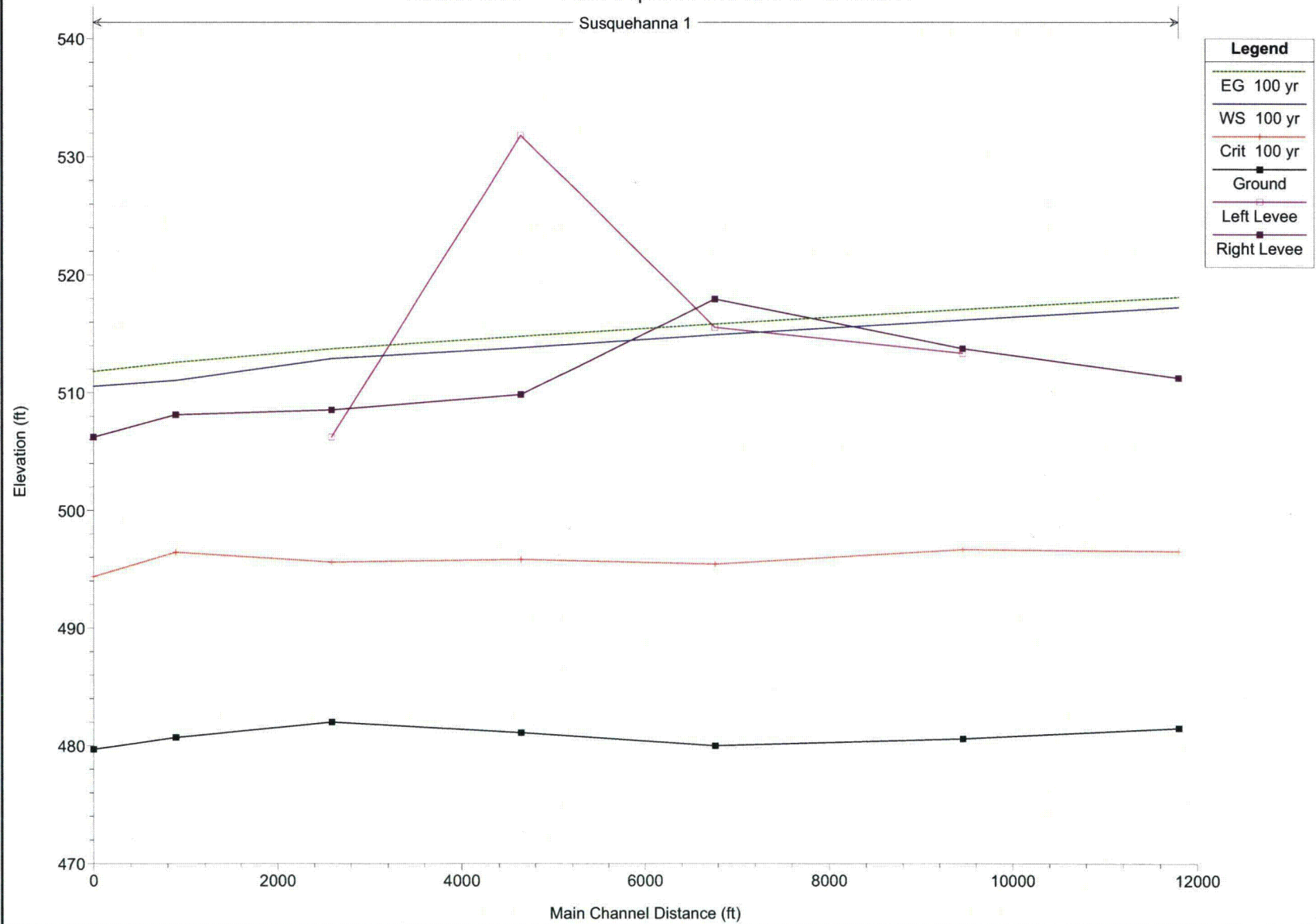


NBSR REV3 Plan: Duplicate Effective B 8/12/2011
River = Susquehanna Reach = 1 RS = 127800 FEMA CP



NBSR REV3 Plan: Duplicate Effective B 8/12/2011

Susquehanna 1



DupEffB.rep

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```

X      X  XXXXXX  XXXX      XXXX      XX      XXXX
X      X  X      X      X      X      X      X
X      X  X      X      X      X      X      X
XXXXXXXX XXXX      XXX XXXX XXXXXX XXXX
X      X  X      X      X      X      X      X
X      X  X      X      X      X      X      X
X      X  XXXXXX  XXXX      X      X      X      XXXXX

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PROJECT DATA

Project Title: NBSR REV3

Project File : NBSRREV3.prj

Run Date and Time: 8/12/2011 3:38:22 PM

Project in English units

FLOW DATA

Flow Title: FEMA Ex Flow

Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Flow Data (cfs)

River	Reach	RS	10 yr	50 yr
100 yr	500 yr100-yr encroachment			
Susquehanna	1	139600	167000	232000
260000	340000	260000		

Boundary Conditions

River Downstream	Reach	Profile	Upstream
Susquehanna	1	10 yr	Critical
Known WS = 504.5			
Susquehanna	1	50 yr	Critical
Known WS = 508.8			
Susquehanna	1	100 yr	Critical
Known WS = 510.5			
Susquehanna	1	500 yr	Critical
Known WS = 515			
Susquehanna	1	100-yr encroachment	Critical
Known WS = 511.5			

DupEffB.rep

GEOMETRY DATA

Geometry Title: Existing HEC2 FEMA

Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g12

CROSS SECTION

RIVER: Susquehanna

REACH: 1

RS: 139600

INPUT

Description: FEMA CU

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	42	521	60	522.1	72	522.1	83	522.7
89	522.7	106	521	176	481.5	180	481.5	640	481.5
647	486.36	678	506.2	733	486.36	754	481.5	1040	481.5
1118	511.2	1190	510.5	1274	509.9	1357	509.9	1464	508.2
1545	507	1627	510.1	1697	510.8	1758	509.2	1824	511.3
1914	511.3	1999	510.2	2029	508.7	2081	512	2127	514.2
2166	507	2212	507	2239	514.2	2331	515.4	2417	517
2519	517	2566	516.7	2575	518.6	2584	518.6	2604	517
2676	518.2	2771	521.1	2844	524.8	2876	532	2889	532
2926	532	2945	530.2	2947	533.3	3011	536.2	3058	539
3123	552.7	3196	559.1	3289	600				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.08	106	.04	647	.055	733	.04	1118	.06

Bank Sta: Left 106 Right 1118 Lengths: Left Channel 2375 Right 2065 Coeff Contr. .1 Expan. .3
 Right Levee Station= 1118 Elevation= 511.2
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 2575 3289 518.6

CROSS SECTION

RIVER: Susquehanna

REACH: 1

RS: 137275

INPUT

Description: FEMA CT

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	76	556.1	160	523	208	512	278	504.5
293	504.5	341	515.5	352	515.5	366	515.9	387	515.9
416	510.2	495	510.9	580	510.5	663	512.1	739	513.3
777	510.2	802	503	812	502.4	848	488	864	480.6
1555	480.6	1579	488	1622	499.7	1683	501.2	1725	509.2
1797	507.8	1882	509.8	1951	504.5	2036	504.8	2127	506.5
2239	509.2	2339	513.7	2460	510.2	2537	510.7	2635	510.3
2727	508.4	2824	508.8	2902	508.9	2989	511	3058	507.9
3124	509.3	3141	504.9	3169	504.9	3182	509.5	3210	509
3282	508.5	3298	513.9	3314	509.7	3552	509.7	3589	513.5
3597	514.5	3600	513.5	3614	512	3651	518	3656	517.9
3700	517.2	3731	518.7	3801	520.8	3867	525.1	3911	540
3924	540	4010	575						

DupEffB.rep

Manning's n Values
 Sta n Val Sta n Val num= 3
 0 .06 777 .04 1622 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 777 1622 2785 2690 2485
 Left Levee Station= 739 Elevation= 513.3
 Right Levee Station= 2339 Elevation= 513.7

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 134600

INPUT

Description: FEMA CS

Station	Elevation	Data	num=	86	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49	571.9	102	570.1	168	562.3	251	540	
266	540	335	531.1	421	522.3	493	516	554	510.8	
592	510.5	605	510.5	679	510.9	770	513.1	868	512.9	
969	513.3	1056	513.3	1157	513.1	1228	512.1	1248	511.4	
1264	511.4	1282	512.9	1339	512.4	1356	515.1	1362	515.5	
1370	515.1	1395	514.8	1406	510.3	1489	509.1	1576	508	
1679	506.2	1720	506.2	1826	506.1	1946	508.1	2005	505.9	
2073	504.8	2140	501.1	2200	500.9	2278	500.7	2301	493.7	
2348	487.7	2489	480	3141	480	3174	487.7	3228	517	
3247	517.9	3255	517.9	3323	517.7	3401	517.5	3492	516.4	
3602	516	3701	512.9	3806	510.1	3870	507.3	3951	505.4	
3990	504	4013	504	4034	505.2	4041	512.1	4049	512.1	
4064	504.9	4089	504.9	4110	513.9	4115	513.9	4123	512.5	
4529	512.5	4541	516.6	4555	515.1	4567	517.5	4572	518	
4580	517.5	4594	513.1	4602	515.8	4618	513.2	4660	522.6	
4698	525.4	4700	525.6	4737	525.6	4761	525.1	4819	522.9	
4881	530.9	4943	544.1	4985	547.5	5023	550.1	5096	563.2	
5162	575									

Manning's n Values
 Sta n Val Sta n Val num= 3
 0 .06 2278 .04 3228 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 2278 3228 2075 2125 2160
 Left Levee Station= 1362 Elevation= 515.5
 Right Levee Station= 3247 Elevation= 517.9

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 132450

INPUT

Description: FEMA CR

Station	Elevation	Data	num=	86	Sta	Elev	Sta	Elev	Sta	Elev
0	575	56	553.9	72	553.9	107	544.9	190	531.8	
263	522.2	331	518.7	404	514	451	509.6	526	509.6	
595	509.6	625	514.9	686	518.8	743	520.6	821	529	
892	530.9	979	531.8	1003	531.7	1045	516.4	1052	516.9	
1053	516.9	1057	516.9	1074	515.2	1103	503.1	1146	501.9	

				DupEffB.rep					
1210	501.9	1244	503.5	1324	503.4	1410	504.9	1513	504.9
1548	503	1602	504.7	1661	505.2	1712	505.2	1794	504
1856	502.2	1921	505.5	1950	503.2	1978	487.5	1988	481.4
2798	481.1	2816	487.5	2869	507.6	2956	507.6	3016	509.8
3089	506.5	3175	505.7	3264	506.8	3321	506.2	3387	505.1
3395	511.8	3402	511.8	3421	504.9	3451	504.9	3472	510
3541	512.1	3637	512.2	3716	511.5	3819	513.3	3918	517.5
3964	520.4	3975	520	3981	520.7	3983	520.7	3987	520.7
3996	520.4	4026	521.4	4107	524.9	4175	526.9	4213	527.5
4223	527.5	4305	530.8	4377	534.2	4473	537	4535	540.1
4547	541.9	4584	541.9	4596	541	4602	544.1	4648	546.6
4740	556.2	4831	565	4862	570.9	4908	573.5	4923	573.5
4933	575								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .08 1921 .04 2869 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1921 2869 2030.01 2050 1650 .1 .3
 Left Levee Station= 979 Elevation= 531.8
 Right Levee Station= 3016 Elevation= 509.8

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 130400

INPUT

Description: FEMA CQ
 Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	101	555.6	198	541.2	289	532.5	371	525.5
385	527	419	527	441	524.6	534	518	614	514.3
697	509.8	775	506.1	807	504	849	508.3	940	510.8
1007	516.4	1019	513.5	1037	516.4	1046	516.4	1055	516.4
1090	502.3	1172	499.3	1209	491.1	1288	502.3	1355	506.2
1418	499.9	1443	488	1514	487.3	1557	487.2	1600	482
2430	482	2443	487.2	2483	500.9	2552	504.9	2642	506.2
2693	508.5	2706	508.5	2753	508	2817	508.4	2897	508.1
2985	508.1	3059	507.9	3132	507.2	3160	505.1	3225	506.7
3304	507	3367	504.7	3434	504.7	3464	505.2	3486	509.5
3500	504.9	3542	504.9	3559	511.1	3570	505.1	3580	504.9
3629	504.9	3692	505.1	3775	506.6	3832	507	3890	519
3905	519.5	3908	519.5	3911	519.5	3922	519	3943	516
3993	520.1	4056	520.9	4128	525	4189	525.7	4233	526.3
4302	528.2	4353	530	4392	530	4457	531.9	4532	535.1
4559	542.6	4573	543.5	4612	543.5	4620	543.2	4687	541.1
4730	545.8	4771	560	4827	563.2	4855	564	4871	564
4914	564.2	4962	564.2	5028	562.1	5074	563.4	5110	575

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .08 1418 .04 2483 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1418 2483 2400 1705 1120 .1 .3
 Left Levee Station= 1355 Elevation= 506.2
 Right Levee Station= 2693 Elevation= 508.5

Blocked Obstructions num= 1
 Sta L Sta R Elev
 0 1046 516.4

DupEffB.rep

CROSS SECTION

RIVER: Susquehanna
REACH: 1

RS: 128690

INPUT

Description:

Station Elevation Data				num=	83				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	60	571.1	110	568.2	196	554.9	217	555.6
234	553.2	272	550.7	284	550.7	355	549.1	435	547.2
499	543.6	563	542.1	577	542.1	629	540.2	724	538.8
750	536.1	769	536.1	793	536.2	823	517	831	517
852	516.1	923	487.1	940	480.7	1659	480.7	1670	487.1
1713	501.4	1787	506	1841	505.8	1857	505.8	1913	505.1
1935	505.1	1994	506.3	2062	508.1	2090	508.1	2160	507.2
2253	506.6	2348	505.9	2414	503	2422	500.8	2461	500.8
2487	503.8	2547	504.8	2568	504.8	2594	501.2	2676	499.9
2709	501.1	2732	507	2790	506.3	2839	510.7	2866	510.7
2879	509.9	2892	504.8	2926	504.8	2943	511.1	2973	517.2
2993	517.2	3002	519.9	3014	520.5	3023	520.5	3033	520
3063	527.2	3141	535	3232	542.1	3303	547.3	3402	550.8
3481	553.2	3558	557.1	3603	559.8	3703	565.8	3784	566.7
3825	566	3852	566.3	3882	567.3	3940	567	4007	566.3
4047	565.8	4076	565.5	4115	564.3	4124	563.8	4166	565.2
4273	558.1	4382	550.4	4477	575				

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	852	.04	1713	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	852	1713		970	890		.1	.3
Right Levee		Station=	2062	Elevation=	508.1			

CROSS SECTION

RIVER: Susquehanna
REACH: 1

RS: 127800

INPUT

Description: FEMA CP

Station Elevation Data				num=	56				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	562	104	559	200	554.9	304	553.7	402	549.9
505	546.8	605	544.6	703	543	753	541.2	773	541.2
838	539.2	877	517.5	892	518	897	518	906	516.1
929	507.4	985	504.9	1020	501	1074	499.9	1098	487
1115	479.7	1920	479.7	1929	487	1957	501.4	2008	503.2
2080	505.1	2105	505.1	2116	505.1	2167	504.4	2188	504.8
2242	506.2	2272	504.9	2297	495.2	2339	492.3	2391	495.2
2439	503.6	2510	506	2582	505	2601	504.2	2629	510.5
2642	510.5	2654	504.7	2687	504.7	2710	510.9	2760	512.1
2787	520	2803	520.7	2808	520.7	2819	520.1	2843	530.1
2894	542.4	2958	554.8	3032	560.7	3131	566.9	3221	570.2
3274	575								

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	1074	.04	1957	.06

DupEffB.rep

Bank Sta: Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
1074	1957		1015 945	960	.1	.3
Right Levee	Station=	2242	Elevation=	506.2		

Profile Output Table - Standard Table 1

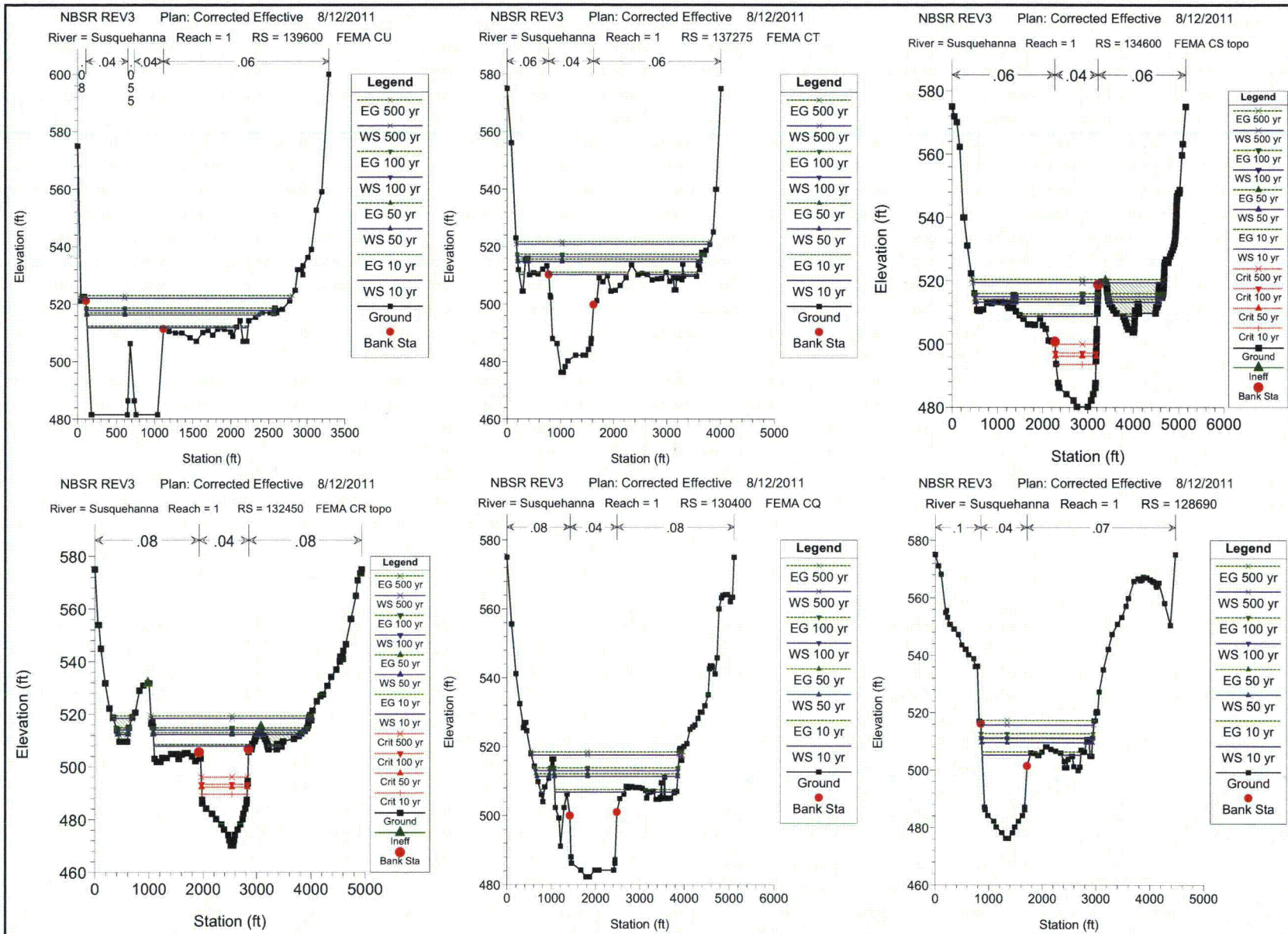
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit
W.S. E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude #	Chl
(ft)	(ft)	(ft/ft)	(cfs)	(ft)	(ft)	
(ft)	(ft)	(ft/ft)	(sq ft)	(ft)	(ft)	
1	139600	100 yr	260000.00	481.50	517.20	
496.49	518.05	0.000429	7.62 40736.70	2455.61		0.24
1	137275	100 yr	260000.00	480.60	516.13	
496.64	517.02	0.000456	8.11 45511.95	3449.45		0.25
1	134600	100 yr	260000.00	480.00	514.87	
495.40	515.79	0.000459	7.98 38207.27	1834.66		0.25
1	132450	100 yr	260000.00	481.10	513.77	
495.80	514.74	0.000530	8.27 41752.06	2752.58		0.26
1	130400	100 yr	260000.00	482.00	512.85	
495.58	513.69	0.000470	7.64 44252.76	2796.46		0.25
1	128690	100 yr	260000.00	480.70	511.00	
496.42	512.55	0.000901	10.26 30951.43	2078.23		0.34
1	127800	100 yr	260000.00	479.70	510.50	
494.35	511.76	0.000685	9.28 32956.34	1774.71		0.30

Appendix G: Corrected Effective Model

- HEC-RAS Reports
- HEC-RAS Cross-Sections
- HEC-RAS Profiles

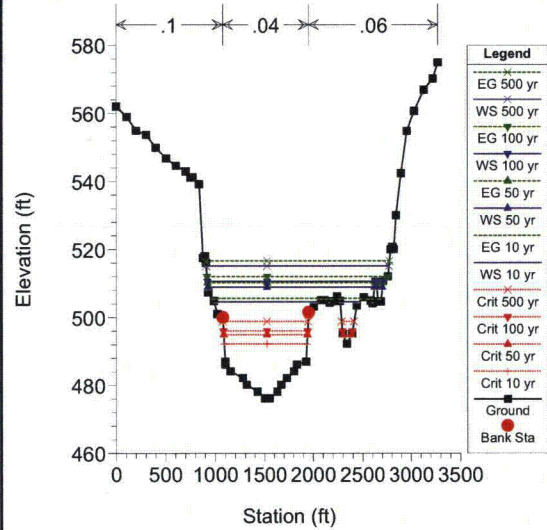
HEC-RAS Plan: Correct Effectiv River: Susquehanna Reach: 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	139600	10 yr	167000.00	481.50	511.61		512.20	0.000356	6.21	28635.68	2040.35	0.21
1	139600	50 yr	232000.00	481.50	516.07		516.82	0.000389	7.11	38120.82	2252.04	0.22
1	139600	100 yr	260000.00	481.50	517.70		518.52	0.000403	7.46	41979.43	2458.90	0.23
1	139600	500 yr	340000.00	481.50	521.88		522.83	0.000422	8.22	52843.65	2704.31	0.24
1	137275	10 yr	167000.00	476.20	510.19		511.01	0.000515	7.38	25783.76	2415.84	0.25
1	137275	50 yr	232000.00	476.20	514.69		515.60	0.000494	8.03	39795.30	3378.69	0.26
1	137275	100 yr	260000.00	476.20	516.40		517.30	0.000476	8.18	45612.57	3452.31	0.25
1	137275	500 yr	340000.00	476.20	520.75		521.65	0.000437	8.52	61018.59	3629.44	0.25
1	134600	10 yr	167000.00	480.20	508.66	493.47	509.44	0.000519	7.13	25493.07	1934.54	0.25
1	134600	50 yr	232000.00	480.20	513.16	496.07	514.10	0.000534	8.02	34154.00	3528.34	0.26
1	134600	100 yr	260000.00	480.20	514.87	497.11	515.85	0.000531	8.29	38687.77	3815.97	0.26
1	134600	500 yr	340000.00	480.20	519.28	499.87	520.36	0.000519	8.91	50831.84	4100.61	0.27
1	132450	10 yr	167000.00	470.20	507.81	489.53	508.46	0.000384	6.52	28467.38	2043.27	0.22
1	132450	50 yr	232000.00	470.20	512.22	492.19	513.07	0.000421	7.54	36723.05	2806.81	0.24
1	132450	100 yr	260000.00	470.20	513.90	493.25	514.82	0.000434	7.93	40041.43	3026.76	0.24
1	132450	500 yr	340000.00	470.20	518.34	496.05	519.34	0.000428	8.56	56130.57	3276.41	0.25
1	130400	10 yr	167000.00	482.20	506.78		507.51	0.000566	6.93	26871.45	2206.41	0.26
1	130400	50 yr	232000.00	482.20	511.26		512.10	0.000536	7.63	39338.38	3060.18	0.26
1	130400	100 yr	260000.00	482.20	512.97		513.84	0.000520	7.84	44648.72	3124.96	0.26
1	130400	500 yr	340000.00	482.20	517.46		518.40	0.000487	8.37	59174.95	3365.02	0.26
1	128690	10 yr	167000.00	476.20	505.13		506.29	0.000851	8.69	20191.82	1314.88	0.32
1	128690	50 yr	232000.00	476.20	509.44		510.89	0.000882	9.84	27827.54	2015.02	0.33
1	128690	100 yr	260000.00	476.20	511.14		512.66	0.000875	10.17	31290.12	2079.02	0.34
1	128690	500 yr	340000.00	476.20	515.65		517.29	0.000831	10.84	40741.19	2112.24	0.33
1	127800	10 yr	167000.00	476.20	504.50	492.07	505.53	0.000780	8.22	21646.01	1282.26	0.31
1	127800	50 yr	232000.00	476.20	508.80	494.79	510.10	0.000799	9.35	28737.90	1752.84	0.32
1	127800	100 yr	260000.00	476.20	510.50	495.92	511.87	0.000790	9.69	31736.34	1774.71	0.32
1	127800	500 yr	340000.00	476.20	515.00	498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32



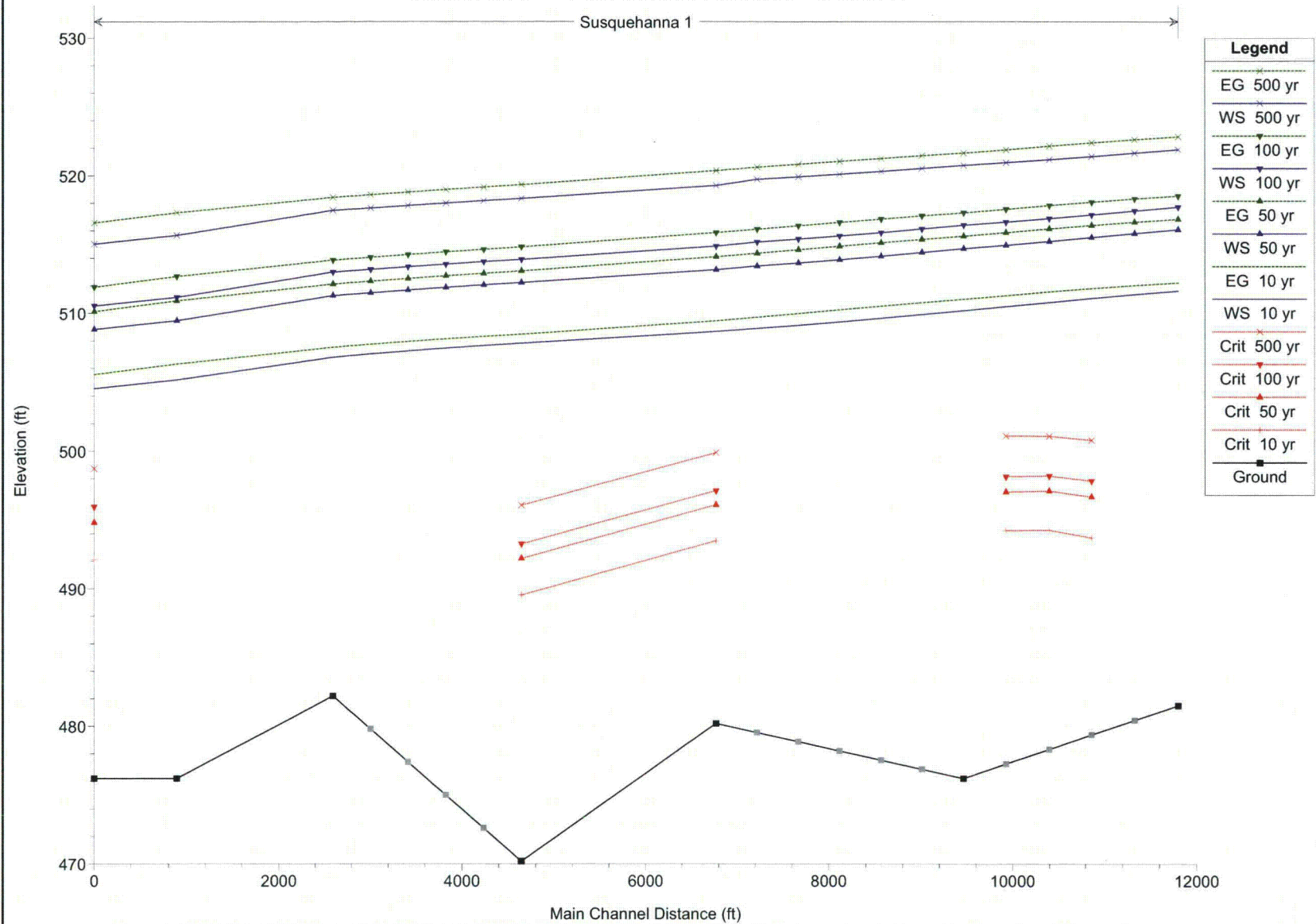
NBSR REV3 Plan: Corrected Effective 8/12/2011

River = Susquehanna Reach = 1 RS = 127800 FEMA CP



NBSR REV3 Plan: Corrected Effective 8/12/2011

Susquehanna 1



CorEff.rep

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X      X  XXXXXX   XXXX      XXXX      XX      XXXX
X      X  X        X      X      X      X      X
X      X  X        X      X      X      X      X
XXXXXXX XXXX      XXX XXXX XXXXXX XXXX
X      X  X        X      X      X      X      X
X      X  X        X      X      X      X      X
X      X  XXXXXX   XXXX      X      X      X      XXXXX

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PROJECT DATA

Project Title: NBSR REV3
Project File : NBSRREV3.prj
Run Date and Time: 8/12/2011 3:45:23 PM

Project in English units

PLAN DATA

Plan Title: Corrected Effective

Plan File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.p13

Geometry Title: Corrected Effective

Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g13

Flow Title : FEMA Ex Flow

Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Plan Summary Information:

Number of:	Cross Sections =	20	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculation tolerance	=	0.01
Maximum number of iterations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Conveyance
Computational Flow Regime:	Subcritical Flow

FLOW DATA

Flow Title: FEMA Ex Flow

Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Flow Data (cfs)

River	Reach	RS	10 yr	50 yr
100 yr	500 yr	100-yr encroachment		
Susquehanna	1	139600	167000	232000
260000	340000	260000		

Boundary Conditions

River Downstream	Reach	Profile	Upstream
Susquehanna	1	10 yr	Critical
Known WS = 504.5			
Susquehanna	1	50 yr	Critical
Known WS = 508.8			
Susquehanna	1	100 yr	Critical
Known WS = 510.5			
Susquehanna	1	500 yr	Critical
Known WS = 515			
Susquehanna	1	100-yr encroachment	Critical
Known WS = 511.5			

GEOMETRY DATA

Geometry Title: Corrected Effective

Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g13

CROSS SECTION

RIVER: Susquehanna

REACH: 1

RS: 139600

INPUT

Description: FEMA CU

Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	42	521	60	522.1	72	522.1	83	522.7
89	522.7	106	521	176	481.5	180	481.5	640	481.5
647	486.36	678	506.2	733	486.36	754	481.5	1040	481.5
1118	511.2	1190	510.5	1274	509.9	1357	509.9	1464	508.2
1545	507	1627	510.1	1697	510.8	1758	509.2	1824	511.3
1914	511.3	1999	510.2	2029	508.7	2081	512	2127	514.2
2166	507	2212	507	2239	514.2	2331	515.4	2417	517
2519	517	2566	516.7	2575	518.6	2584	518.6	2604	517
2676	518.2	2771	521.1	2844	524.8	2876	532	2889	532
2926	532	2945	530.2	2947	533.3	3011	536.2	3058	539
3123	552.7	3196	559.1	3289	600				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val

0 .08 106 .04 CorEff.rep 647 .055 733 .04 1118 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 106 1118 475.01 468 412.99 .1 .3

Blocked Obstructions num= 1

Sta L Sta R Elev
 2575 3289 518.6

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 139135.*

INPUT

Description:

Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	23.49	560.56	49.46	542.15	64.3	533.21	85.94	521.89
90.58	519.79	95.17	518.38	105.42	520.12	108.82	520.19	113.14	520.37
119.64	520.51	128.6	519.56	135.96	519.76	153.02	519.86	163.15	519.83
179.3	520.09	188.08	520.37	201.68	520.54	204.96	520.46	228.45	519.87
240.2	518.84	251.25	513.99	255.67	512.5	271.59	504.7	309.32	492.68
342.47	480.44	345.72	480.44	719.04	480.44	724.72	484.33	749.88	500.2
794.52	484.33	811.56	480.44	1043.67	480.44	1052.99	482.1	1068.53	484.61
1113.58	491.12	1157.08	497.03	1172.62	499.13	1189.71	501.85	1203.69	504.15
1205.44	504.75	1218.8	508.9	1275.37	508.77	1292.24	509.33	1314.31	510.12
1377.92	509.49	1381.08	509.48	1459.9	509.88	1462.58	509.84	1523.88	508.06
1571.72	507.5	1602.7	507.16	1654.34	506.77	1687.09	507.87	1737.98	509.64
1790.95	510.34	1809.37	510.66	1871.59	509.98	1883.68	510.4	1938.91	511.44
1995.88	511.08	2030.71	511.13	2067.28	510.81	2117.41	510.26	2148.01	509.03
2158.16	509.53	2201.05	511.47	2243.47	512.87	2247.97	513.04	2287.75	507.32
2333.42	507.36	2334.67	507.36	2362.21	513.13	2405.75	513.59	2456.05	514.36
2486.42	514.96	2543.77	515.24	2550.41	515.18	2611.61	515.46	2627.37	514.58
2647.81	514.58	2653.34	514.55	2665.39	515.41	2691.36	515.18	2695.75	515.15
2704.93	516.66	2714.11	516.65	2734.51	515.34	2758.12	515.61	2772.96	516.88
2787.8	516.24	2807.95	516.5	2904.84	518.82	2979.3	521.78	3008.5	526.93
3011.94	527.62	3025.2	527.91	3042.81	528.3	3050.22	528.5	3053.01	528.3
3062.94	528.07	3065.99	527.77	3082.32	527.13	3084.36	529.68	3100.3	530.81
3104.93	530.95	3145.74	532.26	3149.64	532.44	3174.48	533.86	3197.58	535.09
3239.39	542.27	3263.88	546.66	3300.6	549.7	3338.34	555.06	3341.4	556.33
3353.45	560.49	3433.2	595						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.076	240.2	.04	763.34	.054	846.51	.042	1218.8	.06
3433.2	.06								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 240.2 1218.8 475.01 468 412.99 .1 .3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 138670.*

INPUT

Description:

Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	36.62	559.44	77.1	537.36	100.23	527.91	133.96	517.54
141.18	515.96	148.35	515.76	164.31	518.97	169.61	519.02	176.36	519.25

CorEff.rep									
186.48	519.36	200.45	517.22	211.92	517.42	238.52	517.62	254.31	517.56
279.47	517.69	293.16	518.04	314.35	518.38	319.47	518.37	356.09	518.23
374.4	516.68	388.94	511.24	394.75	509.97	415.69	500.53	465.33	491.06
508.94	479.38	511.44	479.38	798.08	479.38	802.45	482.3	821.76	494.2
856.04	482.3	869.12	479.38	1047.34	479.38	1061.83	481.13	1085.99	483.51
1156.03	488.89	1223.65	493.32	1247.8	494.9	1274.37	497.44	1296.11	499.66
1298.83	500.56	1319.6	506.6	1377.27	506.88	1394.48	508.17	1416.98	509.89
1481.84	509.09	1485.06	509.06	1565.42	509.86	1568.16	509.77	1630.66	507.17
1679.43	506.79	1711.03	506.57	1763.67	506.54	1797.07	507.53	1848.95	509.19
1902.96	510.05	1921.75	510.52	1985.19	510.77	1997.51	511.23	2053.83	511.57
2111.91	510.86	2147.43	510.96	2184.71	510.78	2235.82	510.31	2267.02	509.36
2277.37	509.72	2321.1	510.94	2364.35	511.75	2368.94	511.89	2409.5	507.64
2456.06	507.72	2457.34	507.72	2485.42	512.06	2529.81	512.41	2581.1	513.32
2612.07	513.97	2670.54	513.49	2677.31	513.36	2739.71	513.92	2755.78	512.16
2776.61	512.16	2782.25	512.14	2794.54	513.93	2821.02	513.64	2825.49	513.61
2834.85	514.72	2844.21	514.69	2865.01	513.67	2889.09	513.83	2904.22	516.14
2919.35	514.6	2939.89	514.8	3038.69	516.54	3114.61	518.76	3144.37	522.62
3147.89	523.23	3161.41	523.82	3179.35	524.6	3186.92	525	3189.75	524.6
3199.89	524.14	3202.99	523.83	3219.65	524.06	3221.73	526.07	3237.97	527.6
3242.7	527.69	3284.3	528.5	3288.29	528.68	3313.61	530.07	3337.16	531.18
3379.8	536.9	3404.76	540.63	3442.2	543.55	3480.68	551.01	3483.8	552.25
3496.09	555.37	3577.4	590						

Manning's n Values			num= 5			n Val			Sta			n Val			Sta			n Val		
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
0	.072	374.4	.04	1047.34	.045	1319.6	.06	3577.4	.06											

Bank Sta: Left		Right	Lengths: Left		Channel	Right	Coeff Contr.		Expan.
Sta	Sta	Sta	Sta	Sta	Sta	Sta	Sta	Sta	Sta
374.4	1319.6		475.01	468	412.99		.1	.3	

Ineffective Flow			num= 1			Permanent		
Sta L	Sta R	Elev	Sta	Sta	Elev	Sta	Sta	Elev
0	314.35	518.38	F					

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 138205.*

INPUT

Description:

Station Elevation Data			num= 117			Sta			Elev			Sta			Elev		
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49.75	558.33	104.73	532.57	136.15	522.61	181.97	513.2								
191.79	512.14	201.52	513.14	223.21	517.81	230.41	517.85	239.57	518.13								
253.32	518.2	272.3	514.88	287.89	515.09	324.01	515.38	345.46	515.29								
379.65	515.3	398.24	515.71	427.03	516.22	433.98	516.28	483.73	516.59								
508.6	514.52	526.63	508.49	533.84	507.45	559.79	496.35	621.34	489.44								
675.42	478.32	677.15	478.32	877.13	478.32	880.17	480.26	893.65	488.2								
917.56	480.26	926.69	478.32	1051.02	478.32	1070.68	480.15	1103.44	482.41								
1198.47	486.66	1290.22	489.61	1322.99	490.67	1359.03	493.03	1388.52	495.17								
1392.22	496.37	1420.4	504.3	1479.18	504.98	1496.72	507	1519.66	509.66								
1585.76	508.68	1589.04	508.64	1670.95	509.84	1673.73	509.71	1737.44	506.28								
1787.15	506.09	1819.35	505.98	1873.01	506.3	1907.04	507.19	1959.93	508.73								
2014.97	509.77	2034.12	510.38	2098.78	511.55	2111.34	512.05	2168.74	511.71								
2227.94	510.64	2264.14	510.79	2302.14	510.75	2354.24	510.37	2386.03	509.69								
2396.58	509.91	2441.15	510.41	2485.23	510.64	2489.91	510.73	2531.25	507.96								
2578.71	508.08	2580.01	508.08	2608.63	510.98	2653.87	511.24	2706.15	512.29								
2737.71	512.98	2797.3	511.73	2804.2	511.54	2867.8	512.38	2884.19	509.74								
2905.42	509.74	2911.17	509.73	2923.7	512.46	2950.68	512.09	2955.24	512.06								
2964.78	512.78	2974.32	512.74	2995.52	512.01	3020.06	512.05	3035.48	515.39								
3050.9	512.97	3071.84	513.1	3172.53	514.26	3249.91	515.74	3280.25	518.32								
3283.83	518.85	3297.61	519.73	3315.9	520.9	3323.61	521.5	3326.5	520.9								

										CorEff.rep			
3336.83	520.21	3339.99	519.89	3356.97	520.99	3359.09	522.45	3375.65	524.4				
3380.47	524.43	3422.87	524.73	3426.93	524.92	3452.74	526.28	3476.75	527.27				
3520.2	531.54	3545.64	534.59	3583.8	537.4	3623.02	546.97	3626.2	548.17				
3638.73	550.25	3721.6	585										
Manning's n Values			num= 6										
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val				
0	.068	508.6	.04	1051.02	.052	1103.44	.047	1420.4	.06				
3721.6	.06												
Bank Sta: Left Right			Lengths: Left Channel Right			Coeff Contr.			Expan.				
508.6 1420.4			475.01 468 412.99			.3			.5				
Ineffective Flow num= 1			Permanent F										
Sta L	Sta R	Elev											
0	253.32	518.2											

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 137740.*

INPUT

Description:

Station Elevation Data				num= 117					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	62.87	557.21	132.37	527.79	172.08	517.3	229.99	508.85
242.39	508.32	254.69	510.53	282.1	516.66	291.2	516.67	302.79	517.02
320.16	517.05	344.15	512.54	363.85	512.75	409.51	513.14	436.62	513.02
479.82	512.9	503.32	513.38	539.71	514.06	548.49	514.19	611.36	514.94
642.8	512.36	664.31	505.75	672.92	504.92	703.9	492.18	777.35	487.82
841.89	477.26	842.87	477.26	956.17	477.26	957.89	478.23	965.53	482.2
979.08	478.23	984.25	477.26	1054.69	477.26	1079.52	479.18	1120.9	481.3
1240.92	484.43	1356.79	485.91	1398.17	486.43	1443.7	488.61	1480.94	490.69
1485.61	492.19	1521.2	502	1581.09	503.09	1598.96	505.83	1622.33	509.43
1689.67	508.27	1693.02	508.22	1776.47	509.82	1779.31	509.64	1844.22	505.39
1894.87	505.39	1927.68	505.39	1982.34	506.07	2017.02	506.84	2070.9	508.28
2126.99	509.48	2146.5	510.24	2212.38	512.33	2225.17	512.88	2283.65	511.84
2343.97	510.42	2380.85	510.62	2419.57	510.73	2472.65	510.42	2505.05	510.02
2515.79	510.11	2561.2	509.88	2606.12	509.52	2610.88	509.58	2653	508.28
2701.35	508.44	2702.68	508.44	2731.84	509.91	2777.94	510.07	2831.2	511.25
2863.36	511.99	2924.07	509.98	2931.1	509.72	2995.9	510.84	3012.59	507.32
3034.23	507.32	3040.08	507.31	3052.85	510.98	3080.34	510.55	3084.99	510.51
3094.71	510.84	3104.43	510.78	3126.03	510.34	3151.03	510.28	3166.74	514.65
3182.45	511.33	3203.78	511.4	3306.38	511.98	3385.22	512.72	3416.12	514.01
3419.78	514.47	3433.81	515.64	3452.45	517.2	3460.31	518	3463.25	517.2
3473.77	516.28	3477	515.94	3494.29	517.93	3496.45	518.83	3513.32	521.2
3518.23	521.16	3561.43	520.97	3565.57	521.16	3591.87	522.49	3616.33	523.36
3660.6	526.17	3686.53	528.56	3725.4	531.25	3765.36	542.93	3768.6	544.08
3781.36	545.12	3865.8	580						

Manning's n Values			num= 6							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
0	.064	642.8	.04	1120.9	.052	1240.92	.05	1521.2	.06	
3865.8	.06									
Bank Sta: Left Right			Lengths: Left Channel Right			Coeff Contr.			Expan.	
642.8 1521.2			475.01 468 412.99			.1			.3	
Ineffective Flow num= 1			Permanent F							
Sta L	Sta R	Elev								
0	320.16	517.05								

CROSS SECTION

CorEff.rep

RIVER: Susquehanna
 REACH: 1

RS: 137275

INPUT

Description: FEMA CT

Station Elevation Data

num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	76	556.1	160	523	208	512	278	504.5
293	504.5	341	515.5	352	515.5	366	515.9	387	515.9
416	510.2	495	510.9	580	510.5	663	512.1	739	513.3
777	510.2	802	503	812	502.4	848	488	933.36	486.2
1008.36	476.2	1058.36	476.2	1088.36	478.2	1138.36	480.2	1283.36	482.2
1423.36	482.2	1473.36	482.2	1528.36	484.2	1573.36	486.2	1579	488
1622	499.7	1683	501.2	1725	509.2	1797	507.8	1882	509.8
1951	504.5	2036	504.8	2127	506.5	2239	509.2	2339	513.7
2460	510.2	2537	510.7	2635	510.3	2727	508.4	2824	508.8
2902	508.9	2989	511	3058	507.9	3124	509.3	3141	504.9
3169	504.9	3182	509.5	3210	509	3282	508.5	3298	513.9
3314	509.7	3552	509.7	3589	513.5	3597	514.5	3600	513.5
3614	512	3651	518	3656	517.9	3700	517.2	3731	518.7
3801	520.8	3867	525.1	3911	540	3924	540	4010	575

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	777	.04	1622	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	777	1622		464.22	448.38	414.27	.1
							.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 136829.*

INPUT

Description:

Station Elevation Data

num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	22.09	571.02	45.99	566.97	75.75	561.01	100.47	554.68
113.18	550.26	119.94	548.58	151.05	539.37	189.83	528.27	211.51	522.18
222.3	520.28	249.8	515.44	266.94	512.91	272.8	512.06	274.97	511.75
306.17	509.71	347.2	507.3	367.51	505.92	387.34	505.9	391.39	506.49
436.93	513.13	450.79	515.13	465.33	515.13	476.16	515.33	483.84	515.46
511.6	515.44	521.7	514.18	549.94	510.54	553.71	510.54	562.73	510.47
569.95	510.51	578.06	510.81	603.76	510.87	611.43	511.36	614.14	511.44
617.74	511.4	629.02	511.41	633.98	510.69	654.37	510.69	671.4	510.55
710.63	510.25	757.07	509.81	766.74	509.78	775.56	509.89	823.36	510.45
876.46	511.43	877.47	511.44	904.07	511.34	934.73	511.46	964.94	511.15
976.93	511.25	992	510.46	1027.17	508.62	1040.08	504.84	1056.8	500.82
1066.46	500.04	1068.65	499.91	1079.68	496.6	1111.32	487.58	1169.49	486.5
1212.5	485.71	1259.3	481.15	1301.39	476.87	1383.06	476.87	1410.08	478.59
1455.12	480.34	1550.03	481.74	1585.73	482.33	1639.08	482.53	1711.84	482.78
1739.27	482.87	1755.83	483.12	1756.88	483.18	1774.76	484.88	1779.21	485.2
1783.66	485.52	1788.11	485.83	1792.57	486.15	1797.02	486.47	1801.47	486.78
1805.92	487.1	1806.42	487.14	1810.38	487.45	1814.83	487.8	1819.28	488.15
1841.54	489.89	1846.89	490.28	1846.96	490.29	1852.04	491.94	1852.32	492.02
1858.11	493.65	1863.54	495.18	1869.04	496.73	1874.47	498.26	1879.9	499.8
1885.34	501.33	1890.77	502.87	1949.81	504.21	1990.46	510.95	1991.15	510.94
2060.14	509.78	2078.96	510.16	2107.22	510.57	2120.99	510.68	2128.2	510.66
2135.87	510.65	2142.41	510.66	2144.96	510.45	2159.85	509.3	2191.17	507.06

CorEff.rep									
2209.19	505.81	2247.5	505.82	2291.46	505.79	2293.07	505.81	2365.93	506.81
2379.53	507.02	2487.93	509.17	2552.42	511.62	2584.72	512.7	2585.26	512.69
2615.56	511.77	2639.55	511	2681.86	509.78	2701.83	509.25	2776.35	509.56
2795.71	509.47	2829.15	509.35	2838	509.48	2841.46	509.64	2844.91	509.79
2847.28	509.95	2850.52	510.11	2853.54	510.26	2856.35	510.42	2871.2	510.37
2872.53	510.34	2874.37	510.14	2924.9	509.25	2927.39	509.37	2929.29	509.5
2931.28	509.63	2947.17	509.35	2951.59	509.1	2956.14	508.86	2960.25	508.62
2960.27	508.62	3054.13	508.95	3129.62	509.03	3213.82	510.78	3280.6	508.2
3344.48	509.37	3360.94	505.7	3388.04	505.7	3400.62	509.53	3407.92	509.59
3415.46	509.64	3427.72	509.45	3433.14	509.42	3447.05	509.33	3476.75	509.32
3479.86	509.47	3482.96	509.62	3486.15	509.77	3489.18	509.92	3492.11	510.06
3494.79	510.22	3497.4	510.2	3506.43	512.82	3512.89	514.65	3528.37	511.04
3529.89	511.03	3538.67	510.87	3547.8	510.7	3557.44	510.53	3569.81	510.53
3588.05	510.7	3602.47	510.87	3608.97	511.03	3614.58	511.2	3618.6	511.37
3621.98	511.53	3624.91	511.7	3627.77	511.87	3630.64	512.03	3633.31	512.2
3649.31	512.37	3676.74	512.53	3683.86	512.53	3718.97	512.37	3735.05	512.37
3742.17	512.53	3758.72	512.6	3782.96	514.84	3794.53	515.94	3802.28	516.82
3805.18	516	3810.81	515.51	3818.73	514.82	3847.72	519	3854.54	519.99
3859.38	519.93	3876.56	519.8	3898.83	519.66	3901.97	519.65	3912.78	520.23
3921.27	520.75	3926.45	521.14	3931.4	521.51	3931.97	521.55	3936.24	521.81
3940.41	522.08	3944.69	522.36	3948.18	522.62	3951.1	522.86	3954.03	523.1
3956.92	523.34	3959.81	523.59	3962.81	523.83	3966.03	524.08	3973.42	524.44
3998.82	525.26	3999.72	525.28	4024.08	526.65	4035.89	527.31	4041.05	527.77
4063.6	529.76	4097.77	540.83	4106.18	543.48	4118.76	543.77	4122.86	545.3
4202	575								

Manning's n Values	num=	3
Sta n Val Sta	n Val Sta n Val	
0 .06 1027.17	.04 1890.77 .06	

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
1027.17 1890.77	464.22 448.38 414.27	.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 136383.*

INPUT

Description:

Station Elevation Data			num= 231						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	27.48	571.2	57.19	567.6	94.2	561.27	124.94	553.26
140.74	548.21	149.15	546.86	187.84	537.71	236.07	527.08	263.03	521.36
276.44	519.42	310.64	514.51	331.95	512.43	339.24	511.75	341.94	511.51
380.73	509.95	431.76	508.46	457.01	507.34	481.67	507.31	486.71	507.77
543.34	513.16	560.58	514.77	578.66	514.77	592.13	514.92	601.68	515.02
636.2	514.98	648.76	513.97	683.87	510.87	688.57	510.85	699.79	510.66
708.76	510.69	718.85	511.23	750.81	511.17	760.34	512.11	763.71	512.25
768.19	512.14	782.21	512.09	788.38	510.61	813.75	510.48	834.92	510.26
883.7	509.8	941.46	509.09	953.48	509.07	964.45	509.15	1023.89	509.58
1089.93	510.75	1091.17	510.77	1124.26	510.25	1162.38	510.13	1199.95	509.14
1214.86	509.2	1233.6	508.55	1277.33	507.03	1292.26	502.61	1311.6	498.63
1322.77	497.57	1325.3	497.42	1338.06	494.52	1374.64	487.17	1441.9	486.04
1491.63	485.21	1545.75	481.36	1594.43	477.53	1707.76	477.53	1731.81	478.97
1771.88	480.49	1856.34	481.84	1888.11	482.47	1935.58	482.87	2000.32	483.35
2024.73	483.53	2039.47	484.03	2040.4	484.16	2056.3	486.85	2060.27	487.3
2064.23	487.75	2068.19	488.21	2072.15	488.66	2076.11	489.11	2080.08	489.57
2084.04	490.02	2084.48	490.07	2088	490.5	2091.96	490.98	2095.93	491.46
2115.74	493.86	2120.49	494.36	2120.55	494.37	2125.07	495.88	2125.32	495.96
2130.47	497.46	2135.31	498.88	2140.2	500.32	2145.04	501.75	2149.87	503.18
2154.7	504.61	2159.54	506.03	2216.61	507.23	2255.91	512.7	2256.58	512.69

CorEff.rep									
2323.29	511.77	2341.48	512.07	2368.79	512.2	2382.11	512.09	2389.08	511.87
2396.5	511.66	2402.82	511.53	2405.29	511.3	2419.68	510.18	2449.96	508.19
2467.38	507.13	2504.42	506.99	2546.92	506.78	2548.48	506.79	2618.92	507.39
2632.07	507.54	2736.87	509.15	2799.21	511.03	2830.44	511.71	2830.96	511.69
2860.25	510.75	2883.45	509.94	2924.35	508.76	2943.66	508.31	3015.71	508.42
3034.42	508.31	3066.75	508.22	3075.31	508.53	3078.65	508.85	3081.99	509.17
3084.28	509.5	3087.41	509.82	3090.33	510.15	3093.05	510.48	3107.41	510.43
3108.68	510.41	3110.47	510.05	3159.32	509.34	3161.72	509.63	3163.57	509.94
3165.49	510.25	3180.85	510.02	3185.12	509.62	3189.52	509.23	3193.49	508.84
3193.51	508.83	3284.25	509.1	3357.24	509.17	3438.65	510.57	3503.21	508.5
3564.97	509.43	3580.87	506.5	3607.07	506.5	3619.24	509.57	3626.3	509.81
3633.59	510.05	3645.44	509.9	3650.68	509.87	3664.13	509.81	3692.84	510
3695.85	510.32	3698.85	510.64	3701.93	510.95	3704.85	511.27	3707.69	511.59
3710.28	511.91	3712.81	511.9	3721.54	514	3727.78	515.41	3742.75	512.39
3744.21	512.37	3752.7	512.03	3761.53	511.7	3770.85	511.37	3782.81	511.37
3800.44	511.7	3814.39	512.03	3820.67	512.37	3826.1	512.7	3829.98	513.03
3833.25	513.37	3836.08	513.7	3838.85	514.03	3841.62	514.37	3844.2	514.7
3859.67	515.03	3886.18	515.37	3893.07	515.37	3927.01	515.03	3942.56	515.03
3949.45	515.37	3965.45	515.5	3988.88	517.41	4000.07	518.37	4007.55	519.13
4010.36	518.5	4015.81	518.15	4023.46	517.64	4051.49	521.14	4058.08	521.98
4062.76	521.97	4079.37	521.98	4100.9	522.07	4103.93	522.11	4114.38	522.73
4122.59	523.34	4127.6	523.85	4132.39	524.35	4132.94	524.41	4137.07	524.79
4141.09	525.21	4145.23	525.63	4148.61	526.03	4151.44	526.43	4154.26	526.82
4157.06	527.22	4159.85	527.61	4162.75	528	4165.87	528.4	4173.01	528.89
4197.56	529.75	4198.44	529.77	4221.99	530.86	4233.41	531.39	4238.4	531.95
4260.19	534.42	4293.23	544.6	4301.37	546.96	4313.53	547.54	4317.48	548.88
4394	575								

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .06 1277.33 .04 2159.54 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1277.33 2159.54 464.22 448.38 414.27 .1 .3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 135937.*

INPUT

Description:

Station Elevation Data num= 231									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	32.86	571.37	68.4	568.22	112.65	561.52	149.41	551.84
168.31	546.16	178.36	545.15	224.63	536.06	282.3	525.88	314.54	520.55
330.58	518.57	371.48	513.58	396.96	511.95	405.68	511.44	408.91	511.26
455.3	510.19	516.32	509.62	546.52	508.75	576.01	508.71	582.03	509.05
649.76	513.2	670.37	514.4	691.99	514.4	708.09	514.52	719.52	514.58
760.8	514.52	775.82	513.75	817.81	511.21	823.43	511.16	836.84	510.84
847.57	510.87	859.64	511.64	897.86	511.48	909.26	512.86	913.28	513.07
918.65	512.88	935.41	512.77	942.79	510.53	973.12	510.27	998.44	509.97
1056.78	509.35	1125.84	508.37	1140.22	508.35	1153.34	508.41	1224.41	508.71
1303.39	510.08	1304.88	510.11	1344.44	509.16	1390.04	508.8	1434.96	507.13
1452.8	507.16	1475.2	506.64	1527.5	505.45	1544.45	500.38	1566.4	496.45
1579.07	495.11	1581.95	494.93	1596.43	492.44	1637.96	486.75	1714.32	485.58
1770.77	484.72	1832.2	481.57	1887.46	478.2	2032.46	478.2	2053.53	479.36
2088.64	480.63	2162.64	481.93	2190.48	482.6	2232.07	483.2	2288.8	483.93
2310.19	484.2	2323.1	484.95	2323.92	485.14	2337.85	488.81	2341.32	489.4
2344.8	489.99	2348.27	490.58	2351.74	491.17	2355.21	491.76	2358.68	492.35
2362.15	492.94	2362.54	493.01	2365.63	493.55	2369.1	494.16	2372.57	494.77
2389.93	497.82	2394.09	498.45	2394.15	498.46	2398.11	499.82	2398.33	499.89

Coreff.rep											
2402.84	501.27	2407.08	502.59	2411.36	503.92	2415.6	505.24	2419.83	506.56		
2424.07	507.88	2428.31	509.2	2483.42	510.24	2521.37	514.45	2522.02	514.44		
2586.43	513.75	2604	513.98	2630.37	513.82	2643.24	513.49	2649.96	513.08		
2657.13	512.67	2663.23	512.39	2665.61	512.15	2679.51	511.06	2708.75	509.32		
2725.58	508.44	2761.34	508.17	2802.38	507.77	2803.88	507.77	2871.9	507.97		
2884.6	508.06	2985.8	509.12	3046.01	510.45	3076.16	510.71	3076.66	510.69		
3104.95	509.74	3127.35	508.88	3166.84	507.75	3185.49	507.36	3255.06	507.29		
3273.13	507.16	3304.35	507.09	3312.61	507.57	3315.84	508.06	3319.06	508.56		
3321.28	509.05	3324.3	509.54	3327.12	510.04	3329.74	510.53	3343.61	510.5		
3344.84	510.49	3346.57	509.97	3393.74	509.43	3396.06	509.9	3397.84	510.38		
3399.7	510.86	3414.53	510.69	3418.65	510.14	3422.91	509.59	3426.74	509.05		
3426.76	509.05	3514.38	509.25	3584.86	509.3	3663.47	510.35	3725.81	508.8		
3785.45	509.5	3800.81	507.3	3826.11	507.3	3837.85	509.6	3844.67	510.03		
3851.71	510.46	3863.15	510.35	3868.22	510.33	3881.2	510.28	3908.93	510.67		
3911.83	511.16	3914.73	511.65	3917.71	512.14	3920.53	512.63	3923.27	513.12		
3925.77	513.61	3928.21	513.6	3936.64	515.17	3942.67	516.16	3957.12	513.73		
3958.54	513.7	3966.73	513.2	3975.26	512.7	3984.26	512.2	3995.8	512.2		
4012.83	512.7	4026.3	513.2	4032.37	513.7	4037.61	514.2	4041.36	514.7		
4044.51	515.2	4047.25	515.7	4049.92	516.2	4052.6	516.7	4055.09	517.2		
4070.03	517.7	4095.63	518.2	4102.28	518.2	4135.06	517.7	4150.07	517.7		
4156.72	518.2	4172.17	518.4	4194.79	519.99	4205.6	520.81	4212.83	521.45		
4215.54	521	4220.8	520.79	4228.19	520.46	4255.26	523.28	4261.62	523.97		
4266.14	524	4282.18	524.16	4302.97	524.48	4305.9	524.56	4315.99	525.22		
4323.92	525.93	4328.75	526.56	4333.38	527.19	4333.91	527.26	4337.9	527.77		
4341.78	528.33	4345.78	528.9	4349.04	529.45	4351.77	530	4354.5	530.54		
4357.2	531.09	4359.9	531.63	4362.69	532.18	4365.71	532.73	4372.6	533.34		
4396.31	534.24	4397.16	534.25	4419.9	535.07	4430.93	535.47	4435.74	536.14		
4456.79	539.09	4488.69	548.38	4496.55	550.44	4508.29	551.31	4512.11	552.46		
4586	575										

Manning's n Values	num=	3
Sta n Val Sta	n Val Sta n Val	
0 .06 1527.5	.04 2428.31 .06	

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
1527.5 2428.31	464.22 448.38 414.27	.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 135491.*

INPUT

Description:

Station Elevation Data			num= 231								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	38.24	571.55	79.6	568.85	131.1	561.78	173.88	550.41		
195.87	544.1	207.58	543.43	261.42	534.41	328.53	524.69	366.06	519.73		
384.72	517.71	432.32	512.65	461.97	511.46	472.12	511.13	475.87	511.02		
529.87	510.42	600.88	510.78	636.02	510.17	670.34	510.11	677.35	510.33		
756.17	513.23	780.16	514.03	805.33	514.03	824.06	514.11	837.36	514.14		
885.4	514.06	902.88	513.53	951.75	511.55	958.29	511.48	973.89	511.03		
986.38	511.04	1000.43	512.06	1044.91	511.79	1058.17	513.6	1062.85	513.88		
1069.1	513.62	1088.61	513.44	1097.19	510.45	1132.49	510.06	1161.96	509.68		
1229.85	508.9	1310.23	507.64	1326.96	507.63	1342.22	507.68	1424.94	507.84		
1516.85	509.41	1518.59	509.44	1564.63	508.08	1617.69	507.47	1669.98	505.12		
1690.73	505.11	1716.8	504.72	1777.67	503.87	1796.63	498.15	1821.19	494.26		
1835.38	492.64	1838.61	492.43	1854.81	490.36	1901.29	486.33	1986.73	485.12		
2049.91	484.23	2118.65	481.78	2180.49	478.87	2357.16	478.87	2375.25	479.75		
2405.41	480.78	2468.95	482.02	2492.85	482.73	2528.57	483.53	2577.28	484.5		
2595.64	484.87	2606.73	485.87	2607.43	486.12	2619.4	490.77	2622.38	491.5		
2625.36	492.23	2628.35	492.95	2631.33	493.68	2634.31	494.41	2637.29	495.13		

CorEff.rep											
2640.27	495.86	2640.6	495.94	2643.25	496.6	2646.23	497.34	2649.21	498.08		
2664.12	501.78	2667.69	502.53	2667.74	502.54	2671.14	503.77	2671.33	503.83		
2675.21	505.08	2678.84	506.29	2682.53	507.51	2686.16	508.73	2689.8	509.94		
2693.44	511.15	2697.07	512.37	2750.23	513.26	2786.83	516.2	2787.45	516.2		
2849.57	515.73	2866.52	515.89	2891.95	515.45	2904.36	514.89	2910.85	514.28		
2917.76	513.68	2923.64	513.25	2925.94	513	2939.34	511.94	2967.54	510.44		
2983.77	509.75	3018.26	509.35	3057.84	508.76	3059.29	508.74	3124.89	508.55		
3137.14	508.58	3234.73	509.1	3292.8	509.87	3321.87	509.71	3322.36	509.69		
3349.64	508.73	3371.25	507.82	3409.34	506.73	3427.31	506.42	3494.41	506.15		
3511.84	506.01	3541.95	505.96	3549.92	506.61	3553.03	507.28	3556.14	507.94		
3558.28	508.6	3561.19	509.26	3563.91	509.92	3566.44	510.59	3579.81	510.57		
3581	510.56	3582.66	509.88	3628.16	509.52	3630.4	510.17	3632.11	510.82		
3633.91	511.47	3648.21	511.36	3652.18	510.66	3656.29	509.96	3659.98	509.27		
3660	509.27	3744.51	509.4	3812.48	509.43	3888.29	510.13	3948.42	509.1		
4005.93	509.57	4020.74	508.1	4045.14	508.1	4056.47	509.63	4063.05	510.26		
4069.84	510.88	4080.87	510.8	4085.75	510.79	4098.28	510.75	4125.02	511.35		
4127.82	512.01	4130.61	512.67	4133.49	513.33	4136.21	513.99	4138.85	514.65		
4141.26	515.31	4143.61	515.3	4151.74	516.35	4157.56	516.92	4171.5	515.08		
4172.86	515.03	4180.76	514.37	4188.99	513.7	4197.67	513.03	4208.8	513.03		
4225.22	513.7	4238.21	514.37	4244.06	515.03	4249.12	515.7	4252.73	516.37		
4255.78	517.03	4258.41	517.7	4260.99	518.37	4263.57	519.03	4265.98	519.7		
4280.38	520.37	4305.08	521.03	4311.49	521.03	4343.1	520.37	4357.58	520.37		
4363.99	521.03	4378.89	521.3	4400.71	522.56	4411.14	523.24	4418.11	523.76		
4420.72	523.5	4425.79	523.43	4432.92	523.28	4459.02	525.42	4465.16	525.96		
4469.52	526.04	4484.99	526.34	4505.04	526.88	4507.86	527.02	4517.6	527.71		
4525.24	528.52	4529.9	529.27	4534.36	530.02	4534.88	530.11	4538.73	530.74		
4542.47	531.45	4546.33	532.16	4549.47	532.87	4552.1	533.56	4554.74	534.26		
4557.34	534.96	4559.94	535.65	4562.64	536.35	4565.54	537.05	4572.19	537.79		
4595.06	538.72	4595.88	538.73	4617.81	539.28	4628.45	539.55	4633.09	540.33		
4653.39	543.75	4684.16	552.15	4691.73	553.92	4703.06	555.09	4706.74	556.04		
4778	575										

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.06 1777.67	.04 2697.07	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1777.67	2697.07		464.22	448.38	414.27		.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 135045.*

INPUT

Description:

Station Elevation Data			num= 231								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	43.62	571.72	90.8	569.47	149.55	562.04	198.35	548.99		
223.44	542.05	236.79	541.72	298.21	532.75	374.77	523.49	417.57	518.91		
438.86	516.86	493.16	511.73	526.99	510.98	538.56	510.81	542.84	510.77		
604.43	510.66	685.44	511.94	725.53	511.59	764.68	511.52	772.68	511.62		
862.59	513.27	889.95	513.67	918.66	513.67	940.03	513.71	955.2	513.71		
1010	513.6	1029.94	513.32	1085.69	511.88	1093.14	511.79	1110.95	511.21		
1125.19	511.22	1141.21	512.48	1191.95	512.09	1207.09	514.35	1212.43	514.69		
1219.55	514.36	1241.8	514.12	1251.6	510.38	1291.86	509.86	1325.48	509.39		
1402.93	508.45	1494.61	506.92	1513.7	506.92	1531.11	506.94	1625.47	506.97		
1730.31	508.74	1732.29	508.77	1784.81	506.99	1845.35	506.13	1904.99	503.11		
1928.66	503.06	1958.4	502.81	2027.83	502.28	2048.82	495.93	2075.99	492.08		
2091.69	490.17	2095.26	489.94	2113.18	488.28	2164.61	485.91	2259.15	484.66		
2329.05	483.74	2405.11	481.99	2473.53	479.53	2681.86	479.53	2696.98	480.14		
2722.17	480.92	2775.25	482.11	2795.22	482.87	2825.06	483.87	2865.76	485.08		

CorEff.rep									
2881.1	485.53	2890.37	486.78	2890.95	487.11	2900.95	492.74	2903.44	493.6
2905.93	494.46	2908.42	495.33	2910.91	496.19	2913.4	497.05	2915.89	497.92
2918.38	498.78	2918.66	498.88	2920.88	499.65	2923.37	500.52	2925.86	501.39
2938.31	505.74	2941.3	506.62	2941.33	506.63	2944.18	507.71	2944.34	507.76
2947.57	508.89	2950.61	510	2953.69	511.11	2956.73	512.21	2959.76	513.32
2962.8	514.43	2965.84	515.53	3017.04	516.27	3052.29	517.94	3052.89	517.95
3112.71	517.72	3129.03	517.79	3153.53	517.07	3165.48	516.3	3171.73	515.49
3178.38	514.69	3184.05	514.12	3186.26	513.85	3199.17	512.82	3226.33	511.57
3241.96	511.07	3275.18	510.52	3313.3	509.75	3314.69	509.72	3377.87	509.12
3389.67	509.11	3483.67	509.07	3539.59	509.28	3567.59	508.71	3568.06	508.7
3594.34	507.71	3615.14	506.76	3651.83	505.72	3669.14	505.47	3733.77	505.01
3750.55	504.85	3779.55	504.83	3787.22	505.66	3790.22	506.49	3793.21	507.32
3795.27	508.15	3798.08	508.98	3800.7	509.81	3803.13	510.64	3816.01	510.63
3817.16	510.63	3818.76	509.79	3862.58	509.61	3864.73	510.43	3866.39	511.26
3868.11	512.09	3881.89	512.03	3885.72	511.18	3889.67	510.33	3893.23	509.49
3893.25	509.48	3974.64	509.55	4040.1	509.57	4113.11	509.92	4171.02	509.4
4226.41	509.63	4240.68	508.9	4264.18	508.9	4275.09	509.67	4281.42	510.48
4287.96	511.29	4298.59	511.25	4303.29	511.24	4315.35	511.23	4341.11	512.02
4343.8	512.85	4346.5	513.68	4349.26	514.51	4351.88	515.34	4354.43	516.17
4356.75	517	4359.02	517	4366.85	517.52	4372.45	517.67	4385.87	516.42
4387.19	516.37	4394.8	515.53	4402.72	514.7	4411.08	513.87	4421.8	513.87
4437.62	514.7	4450.13	515.53	4455.76	516.37	4460.63	517.2	4464.11	518.03
4467.04	518.87	4469.58	519.7	4472.07	520.53	4474.55	521.37	4476.87	522.2
4490.74	523.03	4514.52	523.87	4520.7	523.87	4551.15	523.03	4565.09	523.03
4571.27	523.87	4585.62	524.2	4606.63	525.13	4616.67	525.68	4623.38	526.08
4625.9	526	4630.79	526.06	4637.65	526.1	4662.79	527.56	4668.7	527.95
4672.9	528.07	4687.8	528.52	4707.11	529.29	4709.83	529.47	4719.2	530.21
4726.57	531.11	4731.06	531.99	4735.35	532.86	4735.85	532.96	4739.55	533.72
4743.16	534.58	4746.87	535.43	4749.9	536.28	4752.44	537.13	4754.97	537.98
4757.48	538.83	4759.99	539.68	4762.58	540.53	4765.38	541.38	4771.79	542.25
4793.81	543.21	4794.59	543.22	4815.72	543.49	4825.96	543.62	4830.43	544.51
4849.99	548.41	4879.62	555.93	4886.91	557.39	4897.82	558.86	4901.37	559.62
4970	575								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .06 2027.83 .04 2965.84 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 2027.83 2965.84 464.22 448.38 414.27 .1 .3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 134600

INPUT

Description: FEMA CS topo
 Station Elevation Data

num= 168									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49	571.9	102	570.1	168	562.3	251	540
266	540	335	531.1	421	522.3	493	516	554	510.8
592	510.5	605	510.5	679	510.9	770	513.1	868	512.9
969	513.3	1056	513.3	1157	513.1	1228	512.1	1248	511.4
1264	511.4	1282	512.9	1339	512.4	1356	515.1	1362	515.5
1370	515.1	1395	514.8	1406	510.3	1489	509.1	1576	508
1679	506.2	1720	506.2	1826	506.1	1946	508.1	2005	505.9
2073	504.8	2140	501.1	2200	500.9	2278	500.7	2301	493.7
2348	487.7	2371.56	486.2	2531.56	484.2	2691.56	482.2	2766.56	480.2
3006.56	480.2	3081.56	482.2	3121.56	484.2	3166.56	486.2	3174	487.7
3182.5	494.7	3184.5	495.7	3186.5	496.7	3188.5	497.7	3190.5	498.7
3192.5	499.7	3194.5	500.7	3196.5	501.7	3198.5	502.7	3200.5	503.7

CorEff.rep											
3202.5	504.7	3212.5	509.7	3214.9	510.7	3217.34	511.7	3219.94	512.7		
3222.38	513.7	3224.85	514.7	3227.29	515.7	3229.73	516.7	3232.17	517.7		
3234.61	518.7	3318.32	519.7	3391.55	519.7	3415.11	518.7	3426.6	517.7		
3432.61	516.7	3439.01	515.7	3446.59	514.7	3459	513.7	3485.12	512.7		
3532.1	511.7	3570.1	510.7	3630.86	509.7	3786.38	508.7	3813.76	507.7		
3839.03	506.7	3859.04	505.7	3894.32	504.7	3989.26	503.7	4017.15	503.7		
4024.53	504.7	4027.41	505.7	4030.29	506.7	4032.27	507.7	4034.97	508.7		
4037.49	509.7	4039.83	510.7	4053.32	510.7	4054.86	509.7	4097	509.7		
4099.07	510.7	4100.66	511.7	4102.32	512.7	4115.57	512.7	4119.25	511.7		
4123.05	510.7	4126.49	509.7	4493.71	509.7	4499.8	510.7	4506.09	511.7		
4520.83	511.7	4532.43	511.7	4557.2	512.7	4559.79	513.7	4562.38	514.7		
4565.04	515.7	4567.56	516.7	4570.01	517.7	4572.24	518.7	4581.95	518.7		
4601.51	517.7	4608.83	516.7	4616.45	515.7	4624.49	514.7	4634.8	514.7		
4650.01	515.7	4662.04	516.7	4667.46	517.7	4672.14	518.7	4675.49	519.7		
4678.31	520.7	4680.75	521.7	4683.14	522.7	4685.53	523.7	4687.76	524.7		
4701.1	525.7	4723.97	526.7	4729.91	526.7	4759.19	525.7	4772.6	525.7		
4778.54	526.7	4812.55	527.7	4835.78	528.7	4866.56	529.7	4890.61	530.7		
4909.18	531.7	4920.81	532.7	4927.89	533.7	4932.21	534.7	4936.34	535.7		
4940.38	536.7	4943.85	537.7	4947.42	538.7	4950.33	539.7	4952.77	540.7		
4955.21	541.7	4957.62	542.7	4960.03	543.7	4962.53	544.7	4965.22	545.7		
4971.38	546.7	4992.56	547.7	5013.63	547.7	5023.48	547.7	5027.78	548.7		
5075.08	559.7	5096	563.2	5162	575						

Manning's n Values				num=	3
Sta	n	Val	Sta	n	Val
0	.06		2278	.04	3234.61

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	2278	3234.61		2075	2125	2160		.1	.3
Ineffective Flow			num=	1					
Sta L	Sta R	Elev	Permanent						
3391.55	5162	519.7	F						

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 132450

INPUT

Description: FEMA CR topo
 Station Elevation Data

num= 121											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	56	553.9	72	553.9	107	544.9	190	531.8		
263	522.2	331	518.7	404	514	451	509.6	526	509.6		
595	509.6	625	514.9	686	518.8	743	520.6	821	529		
892	530.9	979	531.8	1003	531.7	1045	516.4	1052	516.9		
1053	516.9	1057	516.9	1074	515.2	1103	503.1	1146	501.9		
1210	501.9	1244	503.5	1324	503.4	1410	504.9	1513	504.9		
1548	503	1602	504.7	1661	505.2	1712	505.2	1794	504		
1856	502.2	1921	505.5	1950	503.2	1978	487.5	1980	486.2		
2051.61	484.2	2161.61	482.2	2236.61	480.2	2336.61	478.2	2386.61	476.2		
2466.61	474.2	2486.61	472.2	2511.61	470.2	2566.61	470.2	2581.61	472.2		
2596.61	474.2	2646.61	476.2	2696.61	478.2	2736.61	480.2	2751.61	482.2		
2786.61	484.2	2811.61	486.2	2816	487.5	2831	493.7	2832.37	494.7		
2846.86	505.7	2849.12	506.7	2895.98	506.7	2898.51	506.7	2909.09	507.7		
2919.39	508.7	2957.66	509.7	2974.43	510.7	2991.15	511.7	3019.84	512.7		
3078.44	512.7	3125.14	511.7	3154.27	510.7	3176.64	509.7	3192.45	508.7		
3203.88	507.7	3215.51	506.7	3367.67	506.7	3373.19	507.7	3377.33	508.7		
3392.87	508.7	3396.25	507.7	3449.4	507.7	3451.23	508.7	3483.19	509.7		
3679.6	510.7	3772.97	511.7	3816.173	512.7	3880.26	513.7	3927.32	514.7		
3946.35	515.7	3951.57	516.7	3955.62	517.7	3965.1	518.7	3971.56	518.7		
3975.93	518.7	3981.62	519.7	3983.08	519.7	3993.16	518.7	3996.51	517.7		

				CorEff.rep					
4002.79	517.7	4026	521.4	4107	524.9	4175	526.9	4213	527.5
4223	527.5	4305	530.8	4377	534.2	4473	537	4535	540.1
4547	541.9	4584	541.9	4596	541	4602	544.1	4648	546.6
4740	556.2	4831	565	4862	570.9	4908	573.5	4923	573.5
4933	575								

Manning's n Values			num=	3					
Sta	n Val	Sta	n Val	Sta	n Val				
0	.08	1921	.04	2849.12	.08				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.	
1921	2849.12	406	410	329.99	.1	.3		
Ineffective Flow		num=	2					
Sta L	Sta R	Elev	Permanent					
0	979	531.8	F					
3078.44	4933	515	F					

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 132040.*

INPUT

Description:

Station	Elevation	Data	num=	209					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	53.07	556.53	68.23	556.08	101.4	547.89	129.66	543.27
180.05	535.39	249.23	526.11	254.19	525.78	313.67	522.31	371.01	518.34
382.84	517.54	427.38	513.43	476.28	512.78	494.26	513.08	498.45	513.08
537.9	513.08	563.84	512.64	566.15	512.94	592.27	516.55	650.08	519.03
685.54	519.59	704.09	519.95	778.01	526.13	788.24	526.29	845.29	527.1
894.79	527.11	927.73	527.16	950.47	526.91	990.27	514.37	994.93	514.62
996.91	514.72	997.86	514.71	1001.65	514.67	1017.76	513.15	1036.01	506.53
1045.24	503.43	1085.99	503.12	1089.93	503.18	1146.63	503.42	1178.85	504.84
1206.75	504.93	1254.66	505.5	1292.77	506.56	1308.17	506.21	1331.28	507.13
1336.16	507.2	1342.83	507.2	1354.39	507.2	1399.32	504.38	1433.77	504.18
1466.93	502.47	1504.59	503.26	1518.11	503.15	1552.09	502.22	1574.02	502.86
1622.34	503.93	1653.51	504.23	1700.05	504.08	1739.52	503.47	1758.8	502.7
1820.4	504.38	1847.21	500.82	1857.56	495.14	1873.09	487.3	1874.94	486.22
1875.91	486.18	1941.14	484.52	2042.82	482.79	2112.15	481.1	2188.01	479.69
2204.59	479.36	2250.81	477.66	2324.76	475.89	2343.25	474.25	2366.36	472.6
2425.36	472.6	2443.97	474.31	2462.58	476.02	2492.92	476.98	2524.62	477.8
2549.21	478.43	2586.66	479.4	2636.29	481	2654.91	482.6	2698.33	484.2
2729.35	485.8	2734.8	486.84	2735	486.89	2751.89	491.79	2753.38	492.39
2753.41	492.4	2755.11	493.41	2773.09	504.4	2775.9	505.54	2825.2	506.22
2827.86	506.26	2833.48	506.74	2838.99	507.16	2849.83	508	2890.09	508.94
2907.74	509.8	2908.6	509.84	2925.33	510.78	2951.16	511.74	2955.51	511.86
2962.01	511.86	3001.24	511.76	3017.17	511.78	3054.65	511.23	3066.3	511.03
3096.95	510.2	3120.49	509.38	3121.42	509.34	3137.12	508.58	3149.15	507.78
3161.38	506.98	3194.87	506.98	3256.63	506.94	3317.55	506.8	3321.48	506.73
3327.28	507.43	3331.64	508.15	3340.92	507.98	3347.99	508.02	3351.55	507.24
3395.17	507.5	3407.47	507.51	3409.39	508.31	3443.02	509.14	3461.11	509.23
3513.69	508.97	3569.6	509.19	3594.64	509.39	3613	510.32	3624.69	509.44
3649.67	509.54	3659.74	509.62	3673.93	510.98	3683.11	509.85	3691.46	509.88
3732.35	510.21	3747.9	510.35	3784.93	511.03	3793.36	511.22	3854.2	512.2
3860.79	512.29	3901.78	513.02	3910.3	513.58	3930.32	515.38	3935.81	516.45
3940.07	517.46	3950.05	518.75	3950.18	518.76	3956.84	518.81	3961.44	518.85
3962.7	519.03	3965.21	519.36	3967.43	519.66	3967.71	519.66	3968.96	519.65
3976.89	518.96	3979.57	518.67	3983.09	517.75	3989.7	517.52	3994.42	517.93
4014.12	520.71	4036.15	521.86	4088.73	523.75	4099.34	524.24	4148.82	526.03
4170.89	526.58	4199.73	527.01	4210.87	527.18	4221.39	527.21	4236.45	527.72
4294.04	529.86	4307.67	530.4	4336.6	531.68	4369.15	532.85	4383.42	533.46

										CorEff.rep			
4423.4	534.63	4484.42	536.6	4486	536.68	4508.53	539.04	4520.22	539.66				
4549.65	540.78	4552.77	541.14	4559.44	541.84	4562.28	542.14	4601.21	541.85				
4613.83	541.03	4615.36	541.62	4620.15	543.63	4651.25	545.73	4668.54	547.88				
4685.47	550.62	4732.21	554.97	4755.58	556.99	4765.34	557.76	4768.93	558.02				
4804.82	560.7	4844.88	563.65	4861.08	564.72	4893.7	569.19	4899.96	569.41				
4938.35	571.32	4942.1	571.77	4957.88	572.99	4968.4	575						

Manning's	n	Values	num=	3								
Sta	n	Val	Sta	n	Val	Sta	n	Val				
0	.08	1820.4	.04	2775.9	.08							

Bank	Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
		1820.4	2775.9		406	410	329.99		.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 131630.*

INPUT

Description:

Station Elevation Data										num=	209
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	50.13	559.16	64.46	558.26	95.79	550.87	122.5	546.36		
170.1	538.99	235.45	530.03	240.14	529.64	296.33	525.93	350.51	521.88		
361.69	521.09	403.76	517.26	449.96	515.96	466.94	516.56	470.91	516.56		
508.18	516.56	532.68	515.68	534.86	515.86	559.54	518.2	614.15	519.26		
647.65	519.19	665.18	519.29	735.01	523.27	744.68	523.29	798.57	523.3		
845.35	522.78	876.46	522.51	897.95	522.12	935.55	512.35	939.95	512.49		
941.82	512.54	942.71	512.52	946.29	512.44	961.51	511.09	978.76	505.9		
987.47	503.75	1025.97	504.33	1029.7	504.46	1083.27	504.95	1113.71	506.18		
1140.06	506.4	1185.33	507.61	1221.32	509.02	1235.88	508.03	1257.71	509.45		
1262.32	509.5	1268.63	509.5	1279.54	509.5	1321.99	503.86	1354.53	503.47		
1385.87	501.95	1421.44	502.27	1434.21	501.61	1466.32	499.44	1487.03	500.53		
1532.69	502.66	1562.13	503.75	1606.1	504.16	1643.39	504.15	1661.61	503.2		
1719.8	503.26	1744.42	498.45	1753.92	493.35	1768.18	487.09	1769.88	486.24		
1770.77	486.18	1830.66	484.83	1924.03	483.37	1987.69	481.99	2057.35	480.82		
2072.57	480.53	2115.01	479.12	2182.91	477.59	2199.89	476.3	2221.11	475		
2284.11	475	2306.33	476.42	2328.55	477.84	2364.77	478.79	2402.63	479.4		
2432	479.88	2476.71	480.6	2535.98	481.8	2558.2	483	2610.06	484.2		
2647.1	485.4	2653.6	486.18	2653.83	486.22	2674	490.39	2675.78	491.09		
2675.83	491.11	2677.86	492.12	2699.32	503.1	2702.67	504.38	2754.42	505.75		
2757.21	505.82	2763.11	506.28	2768.89	506.62	2780.27	507.29	2822.53	508.17		
2841.05	508.89	2841.95	508.93	2859.51	509.86	2886.62	510.93	2891.19	511.02		
2898.01	511.02	2939.18	510.82	2955.9	510.87	2995.24	510.52	3007.47	510.36		
3039.63	509.7	3064.34	509.06	3065.32	509.03	3081.79	508.46	3094.42	507.86		
3107.26	507.26	3142.4	507.26	3207.22	507.18	3271.17	506.9	3275.28	506.76		
3281.38	507.15	3285.95	507.59	3295.69	507.26	3303.11	507.34	3306.84	506.79		
3352.63	507.3	3365.53	507.32	3367.55	507.93	3402.84	508.59	3421.83	508.67		
3477.01	507.91	3535.7	508.07	3561.98	508.34	3581.25	510.11	3593.52	508.31		
3619.73	508.38	3630.31	508.44	3645.2	511.01	3654.83	508.66	3663.59	508.64		
3706.51	508.89	3722.83	509	3761.7	509.55	3770.54	509.73	3834.4	510.8		
3841.31	510.88	3884.33	511.52	3893.28	512.47	3914.29	515.05	3920.05	516.19		
3924.53	517.22	3934.99	518.81	3935.14	518.82	3942.13	518.93	3946.95	519		
3948.28	519.15	3950.9	519.4	3953.24	519.62	3953.53	519.62	3954.85	519.59		
3963.17	518.97	3965.98	518.64	3969.68	517.8	3976.61	517.34	3981.56	517.45		
4002.24	520.01	4025.36	521.42	4080.55	523.04	4091.69	523.59	4143.61	525.77		
4166.78	526.26	4197.05	526.68	4208.74	526.85	4219.78	526.92	4235.59	527.37		
4296.03	529.45	4310.33	529.99	4340.7	531.26	4374.87	532.14	4389.84	532.72		
4431.8	533.95	4495.84	536.21	4497.5	536.28	4521.15	539.93	4533.41	540.62		
4564.31	541.46	4567.58	541.73	4574.58	542.18	4577.56	542.38	4618.42	541.79		
4631.67	541.06	4633.27	541.49	4638.29	543.15	4670.94	545.74	4689.09	549.15		

CorEff.rep

Manning's n Values
 Sta n Val Sta num= 3
 0 .08 1619.2 .04 2629.45 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1619.2 2629.45 406 410 329.99 .1 .3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 130810.*

INPUT

Description:

Station	Elevation	Data	num=	209	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	44.27	564.43	56.92	562.61	84.59	556.84	108.17	552.52			
150.2	546.18	207.91	537.86	212.05	537.35	261.66	533.16	309.5	528.96			
319.37	528.17	356.53	524.92	397.32	522.32	412.31	523.52	415.82	523.52			
448.73	523.52	470.36	521.76	472.29	521.69	494.08	521.5	542.3	519.73			
571.88	518.4	587.36	517.99	649.02	517.54	657.56	517.3	705.15	515.69			
746.45	514.13	773.92	513.23	792.9	512.53	826.1	508.3	829.98	508.23			
831.63	508.18	832.42	508.14	835.59	507.99	849.02	506.99	864.25	504.63			
871.95	504.41	905.94	506.77	909.23	507.02	956.54	507.99	983.41	508.86			
1006.69	509.33	1046.66	511.82	1078.44	513.94	1091.29	511.68	1110.57	514.08			
1114.64	514.1	1120.21	514.1	1129.85	514.1	1167.33	502.82	1196.07	502.03			
1223.73	500.9	1255.15	500.29	1266.42	498.51	1294.77	493.88	1313.06	495.86			
1353.38	500.13	1379.38	502.78	1418.2	504.33	1451.13	505.52	1467.22	504.2			
1518.6	501.02	1538.83	493.69	1546.64	489.78	1558.36	486.68	1559.76	486.28			
1560.49	486.19	1609.71	485.47	1686.45	484.54	1738.77	483.79	1796.02	483.07			
1808.52	482.85	1843.4	482.04	1899.21	480.97	1913.16	480.41	1930.6	479.8			
2001.6	479.8	2031.05	480.64	2060.5	481.48	2108.49	482.4	2158.66	482.6			
2197.57	482.76	2256.82	483	2335.34	483.4	2364.79	483.8	2433.5	484.2			
2482.58	484.6	2491.2	484.86	2491.51	484.87	2518.23	487.6	2520.59	488.5			
2520.65	488.52	2523.34	489.54	2551.79	500.5	2556.22	502.06	2612.85	504.8			
2615.91	504.95	2622.37	505.36	2628.7	505.54	2641.15	505.89	2687.39	506.64			
2707.66	507.09	2708.65	507.11	2727.87	508.02	2757.54	509.31	2762.54	509.34			
2770	509.34	2815.06	508.94	2833.36	509.04	2876.41	509.11	2889.79	509.02			
2925	508.71	2952.03	508.42	2953.11	508.41	2971.14	508.22	2984.95	508.02			
2999.01	507.82	3037.47	507.82	3108.41	507.66	3178.39	507.1	3182.89	506.82			
3189.56	506.6	3194.57	506.49	3205.23	505.82	3213.35	505.99	3217.43	505.87			
3267.54	506.9	3281.66	506.94	3283.88	507.15	3322.5	507.47	3343.28	507.56			
3403.67	505.77	3467.9	505.82	3496.66	506.25	3517.75	509.7	3531.17	506.04			
3559.86	506.06	3571.44	506.08	3587.73	511.07	3598.28	506.29	3607.86	506.15			
3654.84	506.23	3672.7	506.31	3715.23	506.58	3724.91	506.77	3794.8	508			
3802.36	508.06	3849.44	508.51	3859.23	510.23	3882.23	514.4	3888.54	515.69			
3893.43	516.73	3904.89	518.91	3905.05	518.94	3912.7	519.15	3917.98	519.3			
3919.43	519.38	3922.3	519.47	3924.85	519.54	3925.18	519.54	3926.62	519.49			
3935.72	518.99	3938.8	518.57	3942.85	517.89	3950.44	516.99	3955.85	516.48			
3978.49	518.63	4003.79	520.54	4064.18	521.61	4076.38	522.28	4133.2	525.26			
4158.55	525.62	4191.68	526.03	4204.48	526.21	4216.56	526.34	4233.86	526.66			
4300.01	528.62	4315.66	529.18	4348.9	530.42	4386.29	530.71	4402.67	531.24			
4448.6	532.58	4518.69	535.42	4520.5	535.49	4546.38	541.71	4559.8	542.54			
4593.62	542.82	4597.19	542.91	4604.86	542.86	4608.12	542.85	4652.83	541.69			
4667.33	541.13	4669.09	541.23	4674.59	542.2	4710.31	545.78	4730.18	551.7			
4749.62	557.66	4803.3	561.14	4830.14	562.25	4841.36	562.44	4845.48	562.51			
4886.7	563.33	4932.72	564.06	4951.33	563.87	4988.8	564.05	4995.99	563.93			
5040.09	565.38	5044.39	566.58	5062.51	571.45	5074.6	575					

Manning's n Values
 Sta n Val Sta num= 3
 Sta n Val
 Page 16

CorEff.rep

0 .08 1518.6 .04 2556.22 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1518.6 2556.22 406 410 329.99 .1 .3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 130400

INPUT
 Description: FEMA CQ
 Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	101	555.6	198	541.2	289	532.5	371	525.5
385	527	419	527	441	524.6	534	518	614	514.3
697	509.8	775	506.1	807	504	849	508.3	940	510.8
1007	516.4	1019	513.5	1037	516.4	1046	516.4	1055	516.4
1090	502.3	1172	499.3	1209	491.1	1288	502.3	1355	506.2
1418	499.9	1443	488	1455.35	486.2	1665.35	484.2	1785.35	482.2
1860.35	482.2	1980.35	484.2	2080.35	484.2	2410.35	484.2	2440.35	486.2
2443	487.2	2483	500.9	2552	504.9	2642	506.2	2693	508.5
2706	508.5	2753	508	2817	508.4	2897	508.1	2985	508.1
3059	507.9	3132	507.2	3160	505.1	3225	506.7	3304	507
3367	504.7	3434	504.7	3464	505.2	3486	509.5	3500	504.9
3542	504.9	3559	511.1	3570	505.1	3580	504.9	3629	504.9
3692	505.1	3775	506.6	3832	507	3890	519	3905	519.5
3908	519.5	3911	519.5	3922	519	3943	516	3993	520.1
4056	520.9	4128	525	4189	525.7	4233	526.3	4302	528.2
4353	530	4392	530	4457	531.9	4532	535.1	4559	542.6
4573	543.5	4612	543.5	4620	543.2	4687	541.1	4730	545.8
4771	560	4827	563.2	4855	564	4871	564	4914	564.2
4962	564.2	5028	562.1	5074	563.4	5110	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val
0	.08	1418	.04
		2483	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1418 2483 2400 1704.99 1200 .1 .3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 128690

INPUT
 Description:
 Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	60	571.1	110	568.2	196	554.9	217	555.6
234	553.2	272	550.7	284	550.7	355	549.1	435	547.2
499	543.6	563	542.1	577	542.1	629	540.2	724	538.8
750	536.1	769	536.1	793	536.2	823	517	831	517
852	516.1	923	487.1	933.06	486.2	983.06	484.2	1093.06	482.2
1143.06	480.2	1243.06	478.2	1318.06	476.2	1368.06	476.2	1443.06	478.2
1483.06	480.2	1553.06	482.2	1628.06	484.2	1668.06	486.2	1670	487.1
1713	501.4	1787	506	1841	505.8	1857	505.8	1913	505.1
1935	505.1	1994	506.3	2062	508.1	2090	508.1	2160	507.2
2253	506.6	2348	505.9	2414	503	2422	500.8	2461	500.8
2487	503.8	2547	504.8	2568	504.8	2594	501.2	2676	499.9

CorEff.rep									
2709	501.1	2732	507	2790	506.3	2839	510.7	2866	510.7
2879	509.9	2892	504.8	2926	504.8	2943	511.1	2973	517.2
2993	517.2	3002	519.9	3014	520.5	3023	520.5	3033	520
3063	527.2	3141	535	3232	542.1	3303	547.3	3402	550.8
3481	553.2	3558	557.1	3603	559.8	3703	565.8	3784	566.7
3825	566	3852	566.3	3882	567.3	3940	567	4007	566.3
4047	565.8	4076	565.5	4115	564.3	4124	563.8	4166	565.2
4273	558.1	4382	550.4	4477	575				

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .1 852 .04 1713 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
852 1713 970 890 900 .1 .3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 127800

INPUT

Description: FEMA CP

Station Elevation Data num= 66									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	562	104	559	200	554.9	304	553.7	402	549.9
505	546.8	605	544.6	703	543	753	541.2	773	541.2
838	539.2	877	517.5	892	518	897	518	906	516.1
929	507.4	985	504.9	1020	501	1074	499.9	1098	487
1100	486.2	1150	484.2	1275	482.2	1315	480.2	1425	478.2
1500	476.2	1550	476.2	1630	478.2	1670	480.2	1730	482.2
1805	484.2	1835	486.2	1929	487	1957	501.4	2008	503.2
2080	505.1	2105	505.1	2116	505.1	2167	504.4	2188	504.8
2242	506.2	2272	504.9	2297	495.2	2339	492.3	2391	495.2
2439	503.6	2510	506	2582	505	2601	504.2	2629	510.5
2642	510.5	2654	504.7	2687	504.7	2710	510.9	2760	512.1
2787	520	2803	520.7	2808	520.7	2819	520.1	2843	530.1
2894	542.4	2958	554.8	3032	560.7	3131	566.9	3221	570.2
3274	575								

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .1 1074 .04 1957 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1074 1957 1015 945 960 .1 .3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit
W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
(ft)	(ft)	(ft/ft)	(ft/s)	(cfs)	(ft)	(ft)
1	139600	10 yr	167000.00	481.50	511.61	
512.20	0.000356	6.21	28635.68	2040.35	0.21	
1	139600	50 yr	232000.00	481.50	516.07	
516.82	0.000389	7.11	38120.82	2252.04	0.22	
1	139600	100 yr	260000.00	481.50	517.70	
518.52	0.000403	7.46	41979.43	2458.90	0.23	

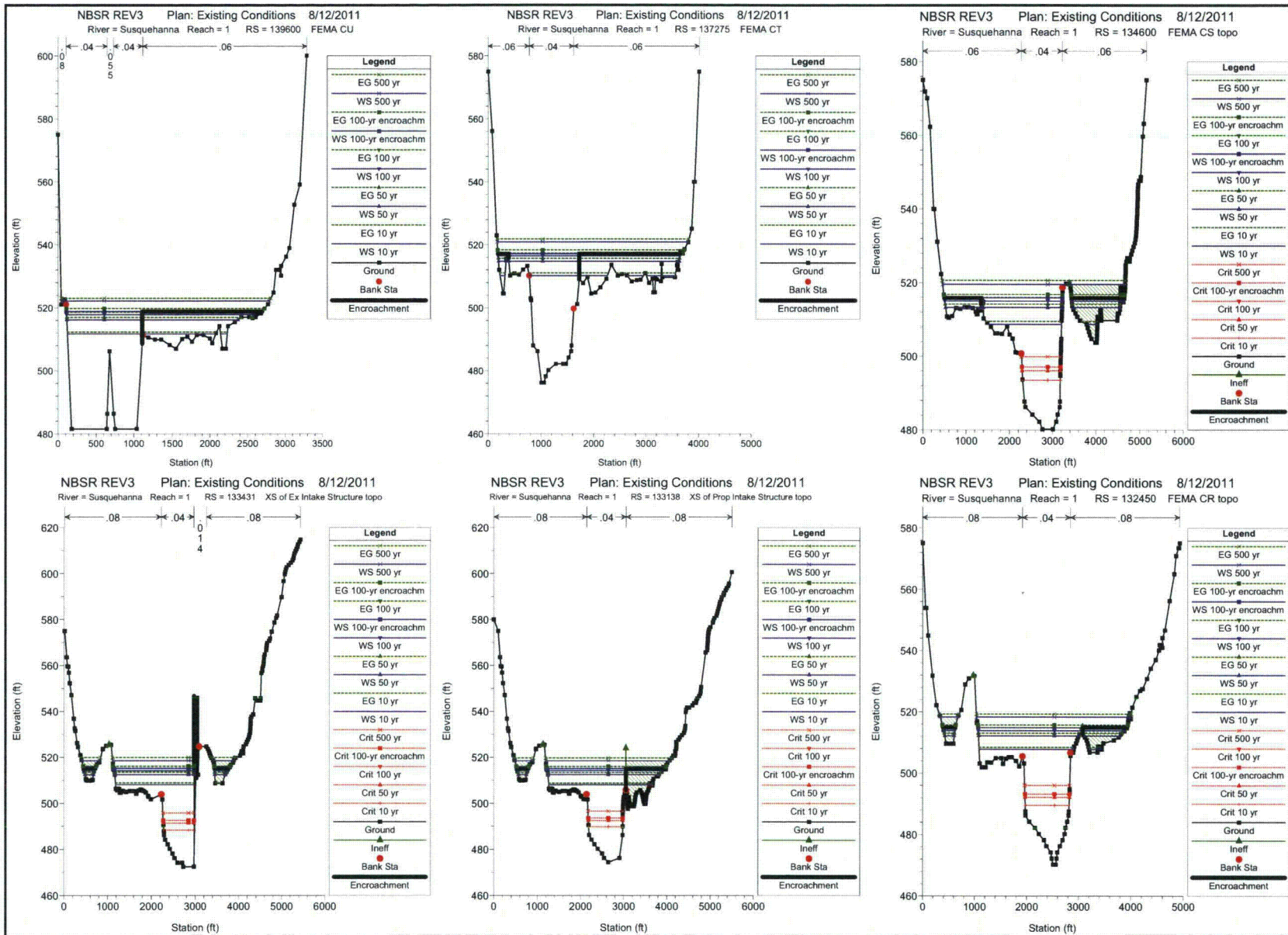
				CorEff.rep			
1	522.83	139600	500 yr	340000.00	481.50	521.88	
		0.000422	8.22	52843.65	2704.31	0.24	
1	511.01	137275	10 yr	167000.00	476.20	510.19	
		0.000515	7.38	25783.76	2415.84	0.25	
1	515.60	137275	50 yr	232000.00	476.20	514.69	
		0.000494	8.03	39795.30	3378.69	0.26	
1	517.30	137275	100 yr	260000.00	476.20	516.40	
		0.000476	8.18	45612.57	3452.31	0.25	
1	521.65	137275	500 yr	340000.00	476.20	520.75	
		0.000437	8.52	61018.59	3629.44	0.25	
1	493.47	134600	10 yr	167000.00	480.20	508.66	
	509.44	0.000519	7.13	25493.07	1934.54	0.25	
1	496.07	134600	50 yr	232000.00	480.20	513.16	
	514.10	0.000534	8.02	34154.00	3528.34	0.26	
1	497.11	134600	100 yr	260000.00	480.20	514.87	
	515.85	0.000531	8.29	38687.77	3815.97	0.26	
1	499.87	134600	500 yr	340000.00	480.20	519.28	
	520.36	0.000519	8.91	50831.84	4100.61	0.27	
1	489.53	132450	10 yr	167000.00	470.20	507.81	
	508.46	0.000384	6.52	28467.38	2043.27	0.22	
1	492.19	132450	50 yr	232000.00	470.20	512.22	
	513.07	0.000421	7.54	36723.05	2806.81	0.24	
1	493.25	132450	100 yr	260000.00	470.20	513.90	
	514.82	0.000434	7.93	40041.43	3026.76	0.24	
1	496.05	132450	500 yr	340000.00	470.20	518.34	
	519.34	0.000428	8.56	56130.57	3276.41	0.25	
1	507.51	130400	10 yr	167000.00	482.20	506.78	
		0.000566	6.93	26871.45	2206.41	0.26	
1	512.10	130400	50 yr	232000.00	482.20	511.26	
		0.000536	7.63	39338.38	3060.18	0.26	
1	513.84	130400	100 yr	260000.00	482.20	512.97	
		0.000520	7.84	44648.72	3124.96	0.26	
1	518.40	130400	500 yr	340000.00	482.20	517.46	
		0.000487	8.37	59174.95	3365.02	0.26	
1	506.29	128690	10 yr	167000.00	476.20	505.13	
		0.000851	8.69	20191.82	1314.88	0.32	
1	510.89	128690	50 yr	232000.00	476.20	509.44	
		0.000882	9.84	27827.54	2015.02	0.33	
1	512.66	128690	100 yr	260000.00	476.20	511.14	
		0.000875	10.17	31290.12	2079.02	0.34	
1	517.29	128690	500 yr	340000.00	476.20	515.65	
		0.000831	10.84	40741.19	2112.24	0.33	
1	492.07	127800	10 yr	167000.00	476.20	504.50	
	505.53	0.000780	8.22	21646.01	1282.26	0.31	
1	494.79	127800	50 yr	232000.00	476.20	508.80	
	510.10	0.000799	9.35	28737.90	1752.84	0.32	
1	495.92	127800	100 yr	260000.00	476.20	510.50	
	511.87	0.000790	9.69	31736.34	1774.71	0.32	
1	498.70	127800	500 yr	340000.00	476.20	515.00	
	516.55	0.000762	10.49	40003.56	1861.00	0.32	

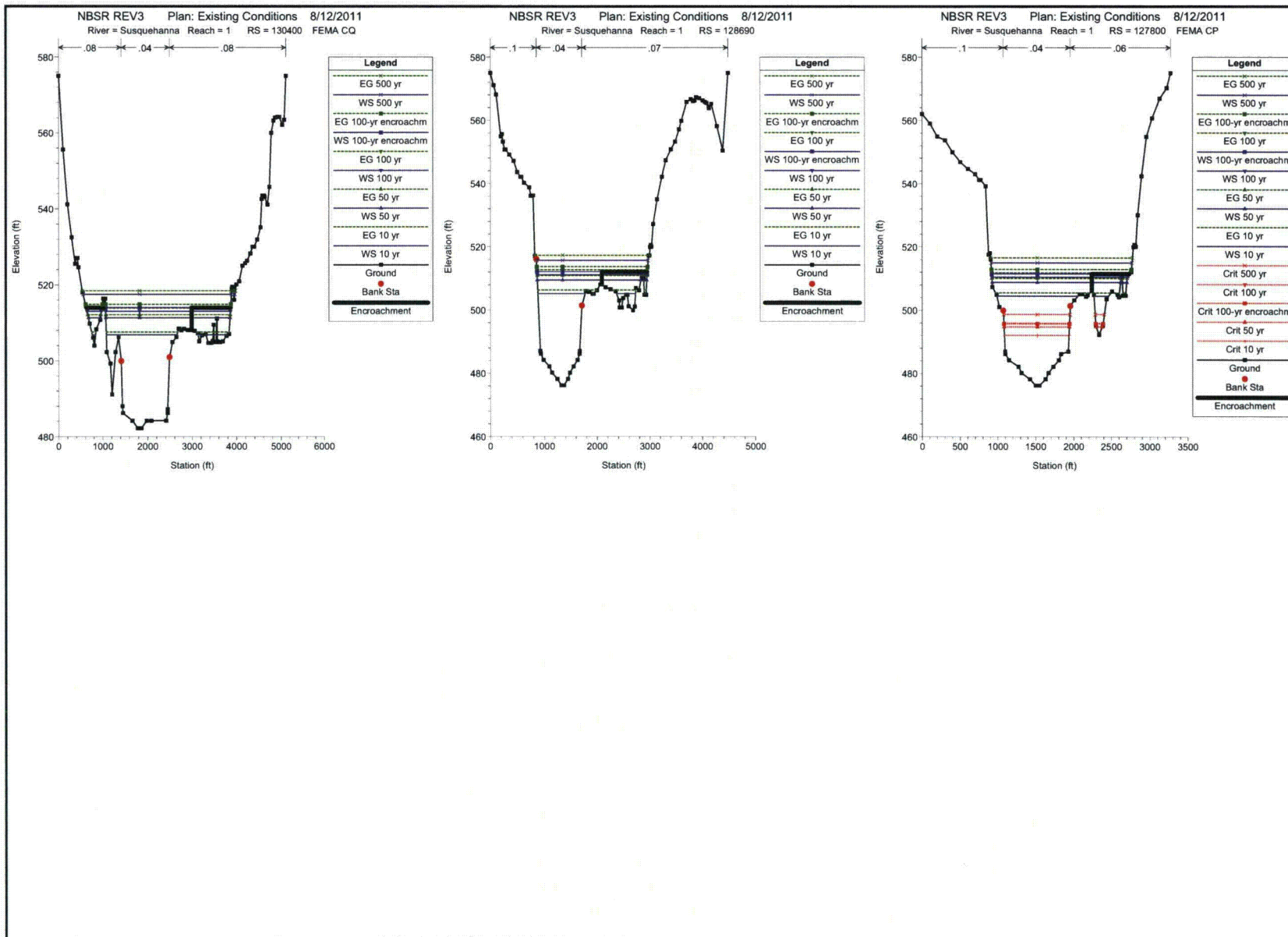
Appendix H: Existing Conditions Model

- HEC-RAS Reports
- HEC-RAS Cross-Sections
- HEC-RAS Profiles

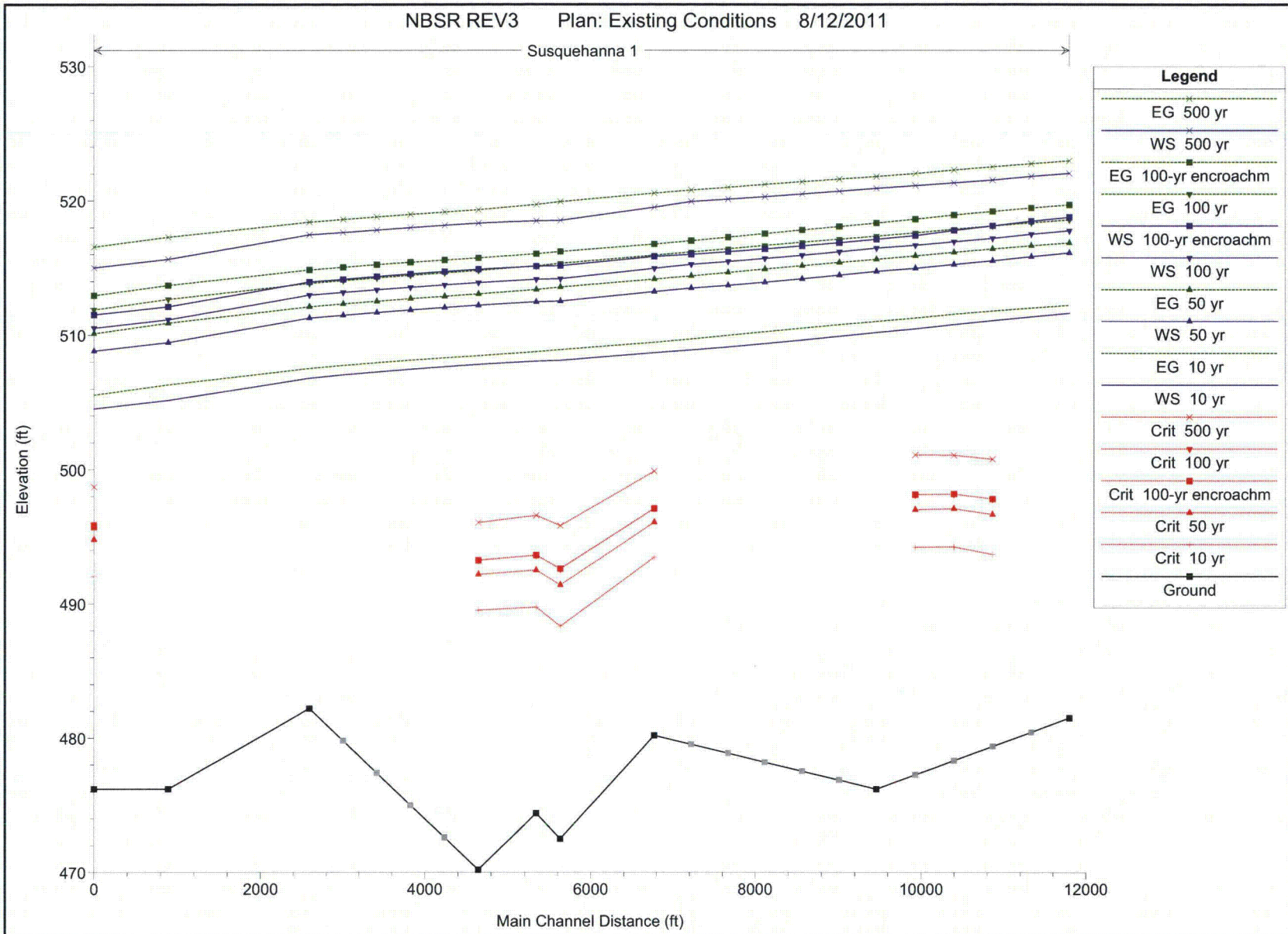
HEC-RAS Plan: Existing River: Susquehanna Reach: 1

Reach	River Sta.	Profile	Q Total	Min. Ch. Elev.	W.S. Elev.	Crit W.S.	E.G. Elev.	E.G. Slope	Vel Chnl.	Flow Area	Top Width	Froude # Chl.
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/m)	(ft/s)	(sq ft)	(ft)	
1	139600	10 yr	167000.00	481.50	511.63		512.22	0.000355	6.20	28687.18	2041.02	0.21
1	139600	50 yr	232000.00	481.50	516.13		516.87	0.000386	7.09	38262.09	2255.52	0.22
1	139600	100 yr	260000.00	481.50	517.79		518.60	0.000398	7.43	42192.71	2459.46	0.23
1	139600	500 yr	340000.00	481.50	522.06		522.99	0.000413	8.16	53331.33	2712.75	0.24
1	139600	100-yr encroachm	260000.00	481.50	518.79		519.71	0.000414	7.69	33801.48	1001.09	0.23
1	137275	10 yr	167000.00	476.20	510.20		511.02	0.000514	7.37	25811.93	2417.80	0.25
1	137275	50 yr	232000.00	476.20	514.75		515.65	0.000489	8.01	39995.78	3379.88	0.25
1	137275	100 yr	260000.00	476.20	516.49		517.38	0.000470	8.14	45914.56	3453.23	0.25
1	137275	500 yr	340000.00	476.20	520.94		521.82	0.000425	8.44	61733.54	3634.26	0.24
1	137275	100-yr encroachm	260000.00	476.20	517.14		518.35	0.000557	8.98	31659.19	1338.00	0.28
1	134600	10 yr	167000.00	480.20	508.68	493.47	509.45	0.000518	7.12	25516.86	1936.11	0.25
1	134600	50 yr	232000.00	480.20	513.23	496.07	514.17	0.000528	7.99	34337.93	3588.54	0.26
1	134600	100 yr	260000.00	480.20	514.98	497.11	515.95	0.000524	8.25	38981.17	3830.95	0.26
1	134600	500 yr	340000.00	480.20	519.52	499.87	520.58	0.000503	8.81	51514.63	4129.96	0.26
1	134600	100-yr encroachm	260000.00	480.20	515.85	497.11	516.78	0.000479	8.03	38503.16	1877.66	0.25
1	133431	10 yr	167000.00	472.50	508.11	488.34	508.91	0.000429	7.25	26294.47	1781.35	0.23
1	133431	50 yr	232000.00	472.50	512.53	491.41	513.58	0.000491	8.45	34198.19	2232.55	0.25
1	133431	100 yr	260000.00	472.50	514.21	492.61	515.35	0.000512	8.90	37217.72	2331.86	0.26
1	133431	500 yr	340000.00	472.50	518.55	495.82	519.94	0.000562	10.01	45198.92	2737.63	0.28
1	133431	100-yr encroachm	260000.00	472.50	515.17	492.61	516.23	0.000463	8.60	38973.73	1837.44	0.25
1	133138	10 yr	167000.00	474.40	508.05	489.76	508.76	0.000435	6.81	26970.08	2392.96	0.23
1	133138	50 yr	232000.00	474.40	512.48	492.51	513.40	0.000470	7.85	34942.32	2761.19	0.25
1	133138	100 yr	260000.00	474.40	514.16	493.62	515.16	0.000482	8.24	37986.67	2871.94	0.25
1	133138	500 yr	340000.00	474.40	518.51	496.58	519.73	0.000512	9.23	46028.69	3276.41	0.27
1	133138	100-yr encroachm	260000.00	474.40	515.13	493.62	516.06	0.000438	7.96	39759.26	1846.64	0.24
1	132450	10 yr	167000.00	470.20	507.81	489.53	508.46	0.000384	6.52	28467.38	2043.27	0.22
1	132450	50 yr	232000.00	470.20	512.22	492.19	513.07	0.000421	7.54	36723.05	2806.81	0.24
1	132450	100 yr	260000.00	470.20	513.90	493.25	514.82	0.000434	7.93	40041.43	3026.76	0.24
1	132450	500 yr	340000.00	470.20	518.34	496.05	519.34	0.000428	8.56	56130.57	3276.41	0.25
1	132450	100-yr encroachm	260000.00	470.20	514.90	493.24	515.75	0.000386	7.63	42052.75	2003.73	0.23
1	130400	10 yr	167000.00	482.20	506.78		507.51	0.000566	6.93	26871.45	2206.41	0.26
1	130400	50 yr	232000.00	482.20	511.26		512.10	0.000536	7.63	39338.38	3060.18	0.26
1	130400	100 yr	260000.00	482.20	512.97		513.84	0.000520	7.84	44648.72	3124.96	0.26
1	130400	500 yr	340000.00	482.20	517.46		518.40	0.000487	8.37	59174.95	3365.02	0.26
1	130400	100-yr encroachm	260000.00	482.20	513.95		514.85	0.000497	7.84	39326.96	1923.92	0.26
1	128690	10 yr	167000.00	476.20	505.13		506.29	0.000851	8.69	20191.82	1314.88	0.32
1	128690	50 yr	232000.00	476.20	509.44		510.89	0.000882	9.84	27827.54	2015.02	0.33
1	128690	100 yr	260000.00	476.20	511.14		512.66	0.000875	10.17	31290.12	2079.02	0.34
1	128690	500 yr	340000.00	476.20	515.65		517.29	0.000831	10.84	40741.19	2112.24	0.33
1	128690	100-yr encroachm	260000.00	476.20	512.10		513.69	0.000847	10.22	27356.42	1228.21	0.33
1	127800	10 yr	167000.00	476.20	504.50	492.07	505.53	0.000780	8.22	21646.01	1282.26	0.31
1	127800	50 yr	232000.00	476.20	508.80	494.79	510.10	0.000799	9.35	28737.90	1752.84	0.32
1	127800	100 yr	260000.00	476.20	510.50	495.92	511.87	0.000790	9.69	31736.34	1774.71	0.32
1	127800	500 yr	340000.00	476.20	515.00	498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32
1	127800	100-yr encroachm	260000.00	476.20	511.50	495.74	512.93	0.000760	9.72	29288.21	1323.84	0.32





NBSR REV3 Plan: Existing Conditions 8/12/2011



Existing.rep

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```

X      X  XXXXXX   XXXX      XXXX      XX      XXXX
X      X  X        X      X      X      X      X
X      X  X        X      X      X      X      X
XXXXXXXX XXXX      XXX XXXX      XXXXXX      XXXX
X      X  X        X      X      X      X      X
X      X  X        X      X      X      X      X
X      X  XXXXXX   XXXX      X      X      X      XXXXX

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PROJECT DATA

Project Title: NBSR REV3
Project File : NBSRREV3.prj
Run Date and Time: 8/12/2011 10:16:35 AM

Project in English units

PLAN DATA

Plan Title: Existing Conditions
Plan File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.p10
Geometry Title: Existing Conditions
Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g10
Flow Title : FEMA Ex Flow
Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Plan Summary Information:

Number of:	Cross Sections	= 22	Multiple Openings	= 0
	Culverts	= 0	Inline Structures	= 0
	Bridges	= 0	Lateral Structures	= 0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data

Equal Conveyance = False
Left Offset = 0
Right Offset = 0

River = Susquehanna Reach = 1

RS	Profile	Method	Existing.rep	
			value1	value2
139600	50 yr	0	0	0
139135.*	50 yr	0	0	0
138670.*	50 yr	0	0	0
138205.*	50 yr	0	0	0
137740.*	50 yr	0	0	0
137275	50 yr	0	0	0
136829.*	50 yr	0	0	0
136383.*	50 yr	0	0	0
135937.*	50 yr	0	0	0
135491.*	50 yr	0	0	0
135045.*	50 yr	0	0	0
134600	50 yr	0	0	0
133431	50 yr	0	0	0
133138	50 yr	0	0	0
132450	50 yr	0	0	0
132040.*	50 yr	0	0	0
131630.*	50 yr	0	0	0
131220.*	50 yr	0	0	0
130810.*	50 yr	0	0	0
130400	50 yr	0	0	0
128690	50 yr	0	0	0
127800	50 yr	0	0	0

River = Susquehanna		Reach = 1		
RS	Profile	Method	Value1	Value2
139600	100 yr	0		
139135.*	100 yr	0		
138670.*	100 yr	0		
138205.*	100 yr	0		
137740.*	100 yr	0		
137275	100 yr	0		
136829.*	100 yr	0		
136383.*	100 yr	0		
135937.*	100 yr	0		
135491.*	100 yr	0		
135045.*	100 yr	0		
134600	100 yr	0		
133431	100 yr	0		
133138	100 yr	0		
132450	100 yr	0		
132040.*	100 yr	0		
131630.*	100 yr	0		
131220.*	100 yr	0		
130810.*	100 yr	0		
130400	100 yr	0		
128690	100 yr	0		
127800	100 yr	0		

River = Susquehanna		Reach = 1		
RS	Profile	Method	Value1	Value2
139600	500 yr	0	0	0
139135.*	500 yr	0	0	0
138670.*	500 yr	0	0	0
138205.*	500 yr	0	0	0
137740.*	500 yr	0	0	0
137275	500 yr	0	0	0
136829.*	500 yr	0	0	0
136383.*	500 yr	0	0	0
135937.*	500 yr	0	0	0
135491.*	500 yr	0	0	0
135045.*	500 yr	0	0	0
134600	500 yr	0	0	0

			Existing.rep
133431	500 yr	0	0
133138	500 yr	0	0
132450	500 yr	0	0
132040.*	500 yr	0	0
131630.*	500 yr	0	0
131220.*	500 yr	0	0
130810.*	500 yr	0	0
130400	500 yr	0	0
128690	500 yr	0	0
127800	500 yr	0	0

River = Susquehanna	Reach = 1			
RS	Profile	Method	Value1	Value2
139600	100-yr	encroachment	1	89 1111
139135.*	100-yr	encroachment	1	210 1314.31
138670.*	100-yr	encroachment	1	319.47 1416.98
138205.*	100-yr	encroachment	1	490 1519.66
137740.*	100-yr	encroachment	1	612 1622.33
137275	100-yr	encroachment	1	387 1725
136829.*	100-yr	encroachment	1	515 1990.46
136383.*	100-yr	encroachment	1	635 2255.91
135937.*	100-yr	encroachment	1	770 2521.37
135491.*	100-yr	encroachment	1	885 2790
135045.*	100-yr	encroachment	1	1210 3050
134600	100-yr	encroachment	1	1350 3310
133431	100-yr	encroachment	1	1075 2965.8
133138	100-yr	encroachment	1	1165 3054
132450	100-yr	encroachment	1	1065 3078.44
132040.*	100-yr	encroachment	1	950.47 3017.17
131630.*	100-yr	encroachment	1	925 2955.9
131220.*	100-yr	encroachment	1	875 2935.83
130810.*	100-yr	encroachment	1	1125 2889.79
130400	100-yr	encroachment	1	1060 2985
128690	100-yr	encroachment	1	860 2090
127800	100-yr	encroachment	1	892 2242

FLOW DATA

Flow Title: FEMA Ex Flow

Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Flow Data (cfs)

River	Reach	RS	10 yr	50 yr
100 yr	500 yr	100-yr encroachment		
Susquehanna	1	139600	167000	232000
260000	340000	260000		

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Susquehanna	1	10 yr	critical
Known WS = 504.5			

Susquehanna	1	Existing.rep	
Known WS = 508.8		50 yr	Critical
Susquehanna	1	100 yr	Critical
Known WS = 510.5			
Susquehanna	1	500 yr	Critical
Known WS = 515			
Susquehanna	1	100-yr encroachment	Critical
Known WS = 511.5			

GEOMETRY DATA

Geometry Title: Existing Conditions

Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g10

CROSS SECTION

RIVER: Susquehanna

REACH: 1

RS: 139600

INPUT

Description: FEMA CU

Station	Elevation	Data	num=	53							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	42	521	60	522.1	72	522.1	83	522.7		
89	522.7	106	521	176	481.5	180	481.5	640	481.5		
647	486.36	678	506.2	733	486.36	754	481.5	1040	481.5		
1118	511.2	1190	510.5	1274	509.9	1357	509.9	1464	508.2		
1545	507	1627	510.1	1697	510.8	1758	509.2	1824	511.3		
1914	511.3	1999	510.2	2029	508.7	2081	512	2127	514.2		
2166	507	2212	507	2239	514.2	2331	515.4	2417	517		
2519	517	2566	516.7	2575	518.6	2584	518.6	2604	517		
2676	518.2	2771	521.1	2844	524.8	2876	532	2889	532		
2926	532	2945	530.2	2947	533.3	3011	536.2	3058	539		
3123	552.7	3196	559.1	3289	600						

Manning's n	Values	num=	5								
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.08	106	.04	647	.055	733	.04	1118	.06		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	106	1118		475	468	413		.1	.3

Blocked Obstructions	num=	1
Sta L	Sta R	Elev
2575	3289	518.6

CROSS SECTION

RIVER: Susquehanna

REACH: 1

RS: 139135.*

INPUT

Description:

Station	Elevation	Data	num=	117							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	23.49	560.56	49.46	542.15	64.3	533.21	85.94	521.89		
90.58	519.79	95.17	518.38	105.42	520.12	108.82	520.19	113.14	520.37		
119.64	520.51	128.6	519.56	135.96	519.76	153.02	519.86	163.15	519.83		

Existing.rep											
179.3	520.09	188.08	520.37	201.68	520.54	204.96	520.46	228.45	519.87		
240.2	518.84	251.25	513.99	255.67	512.5	271.59	504.7	309.32	492.68		
342.47	480.44	345.72	480.44	719.04	480.44	724.72	484.33	749.88	500.2		
794.52	484.33	811.56	480.44	1043.67	480.44	1052.99	482.1	1068.53	484.61		
1113.58	491.12	1157.08	497.03	1172.62	499.13	1189.71	501.85	1203.69	504.15		
1205.44	504.75	1218.8	508.9	1275.37	508.77	1292.24	509.33	1314.31	510.12		
1377.92	509.49	1381.08	509.48	1459.9	509.88	1462.58	509.84	1523.88	508.06		
1571.72	507.5	1602.7	507.16	1654.34	506.77	1687.09	507.87	1737.98	509.64		
1790.95	510.34	1809.37	510.66	1871.59	509.98	1883.68	510.4	1938.91	511.44		
1995.88	511.08	2030.71	511.13	2067.28	510.81	2117.41	510.26	2148.01	509.03		
2158.16	509.53	2201.05	511.47	2243.47	512.87	2247.97	513.04	2287.75	507.32		
2333.42	507.36	2334.67	507.36	2362.21	513.13	2405.75	513.59	2456.05	514.36		
2486.42	514.96	2543.77	515.24	2550.41	515.18	2611.61	515.46	2627.37	514.58		
2647.81	514.58	2653.34	514.55	2665.39	515.41	2691.36	515.18	2695.75	515.15		
2704.93	516.66	2714.11	516.65	2734.51	515.34	2758.12	515.61	2772.96	516.88		
2787.8	516.24	2807.95	516.5	2904.84	518.82	2979.3	521.78	3008.5	526.93		
3011.94	527.62	3025.2	527.91	3042.81	528.3	3050.22	528.5	3053.01	528.3		
3062.94	528.07	3065.99	527.77	3082.32	527.13	3084.36	529.68	3100.3	530.81		
3104.93	530.95	3145.74	532.26	3149.64	532.44	3174.48	533.86	3197.58	535.09		
3239.39	542.27	3263.88	546.66	3300.6	549.7	3338.34	555.06	3341.4	556.33		
3353.45	560.49	3433.2	595								

Manning's n Values			num= 6			n Val			n Val		
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.076	240.2	.04	794.52	.054	1043.67	.042	1218.8	.06		
3433.2	.06										

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	240.2	1218.8		475	468	413		.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 138670.*

INPUT

Description:

Station Elevation Data			num= 117								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	36.62	559.44	77.1	537.36	100.23	527.91	133.96	517.54		
141.18	515.96	148.35	515.76	164.31	518.97	169.61	519.02	176.36	519.25		
186.48	519.36	200.45	517.22	211.92	517.42	238.52	517.62	254.31	517.56		
279.47	517.69	293.16	518.04	314.35	518.38	319.47	518.37	356.09	518.23		
374.4	516.68	388.94	511.24	394.75	509.97	415.69	500.53	465.33	491.06		
508.94	479.38	511.44	479.38	798.08	479.38	802.45	482.3	821.76	494.2		
856.04	482.3	869.12	479.38	1047.34	479.38	1061.83	481.13	1085.99	483.51		
1156.03	488.89	1223.65	493.32	1247.8	494.9	1274.37	497.44	1296.11	499.66		
1298.83	500.56	1319.6	506.6	1377.27	506.88	1394.48	508.17	1416.98	509.89		
1481.84	509.09	1485.06	509.06	1565.42	509.86	1568.16	509.77	1630.66	507.17		
1679.43	506.79	1711.03	506.57	1763.67	506.54	1797.07	507.53	1848.95	509.19		
1902.96	510.05	1921.75	510.52	1985.19	510.77	1997.51	511.23	2053.83	511.57		
2111.91	510.86	2147.43	510.96	2184.71	510.78	2235.82	510.31	2267.02	509.36		
2277.37	509.72	2321.1	510.94	2364.35	511.75	2368.94	511.89	2409.5	507.64		
2456.06	507.72	2457.34	507.72	2485.42	512.06	2529.81	512.41	2581.1	513.32		
2612.07	513.97	2670.54	513.49	2677.31	513.36	2739.71	513.92	2755.78	512.16		
2776.61	512.16	2782.25	512.14	2794.54	513.93	2821.02	513.64	2825.49	513.61		
2834.85	514.72	2844.21	514.69	2865.01	513.67	2889.09	513.83	2904.22	516.14		
2919.35	514.6	2939.89	514.8	3038.69	516.54	3114.61	518.76	3144.37	522.62		
3147.89	523.23	3161.41	523.82	3179.35	524.6	3186.92	525	3189.75	524.6		
3199.89	524.14	3202.99	523.83	3219.65	524.06	3221.73	526.07	3237.97	527.6		
3242.7	527.69	3284.3	528.5	3288.29	528.68	3313.61	530.07	3337.16	531.18		
3379.8	536.9	3404.76	540.63	3442.2	543.55	3480.68	551.01	3483.8	552.25		

Existing.rep

3496.09	555.37	3577.4	590						
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Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.072	374.4	.04	1047.34	.045	1319.6	.06	3577.4	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

374.4	1319.6	475	468	413	.1	.3
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Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	314.35	518.38	F

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 138205.*

INPUT

Description:

Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49.75	558.33	104.73	532.57	136.15	522.61	181.97	513.2
191.79	512.14	201.52	513.14	223.21	517.81	230.41	517.85	239.57	518.13
253.32	518.2	272.3	514.88	287.89	515.09	324.01	515.38	345.46	515.29
379.65	515.3	398.24	515.71	427.03	516.22	433.98	516.28	483.73	516.59
508.6	514.52	526.63	508.49	533.84	507.45	559.79	496.35	621.34	489.44
675.42	478.32	677.15	478.32	877.13	478.32	880.17	480.26	893.65	488.2
917.56	480.26	926.69	478.32	1051.02	478.32	1070.68	480.15	1103.44	482.41
1198.47	486.66	1290.22	489.61	1322.99	490.67	1359.03	493.03	1388.52	495.17
1392.22	496.37	1420.4	504.3	1479.18	504.98	1496.72	507.19	1519.66	509.66
1585.76	508.68	1589.04	508.64	1670.95	509.84	1673.73	509.71	1737.44	506.28
1787.15	506.09	1819.35	505.98	1873.01	506.3	1907.04	507.19	1959.93	508.73
2014.97	509.77	2034.12	510.38	2098.78	511.55	2111.34	512.05	2168.74	511.71
2227.94	510.64	2264.14	510.79	2302.14	510.75	2354.24	510.37	2386.03	509.69
2396.58	509.91	2441.15	510.41	2485.23	510.64	2489.91	510.73	2531.25	507.96
2578.71	508.08	2580.01	508.08	2608.63	510.98	2653.87	511.24	2706.15	512.29
2737.71	512.98	2797.3	511.73	2804.2	511.54	2867.8	512.38	2884.19	509.74
2905.42	509.74	2911.17	509.73	2923.7	512.46	2950.68	512.09	2955.24	512.06
2964.78	512.78	2974.32	512.74	2995.52	512.01	3020.06	512.05	3035.48	515.39
3050.9	512.97	3071.84	513.1	3172.53	514.26	3249.91	515.74	3280.25	518.32
3283.83	518.85	3297.61	519.73	3315.9	520.9	3323.61	521.5	3326.5	520.9
3336.83	520.21	3339.99	519.89	3356.97	520.99	3359.09	522.45	3375.65	524.4
3380.47	524.43	3422.87	524.73	3426.93	524.92	3452.74	526.28	3476.75	527.27
3520.2	531.54	3545.64	534.59	3583.8	537.4	3623.02	546.97	3626.2	548.17
3638.73	550.25	3721.6	585						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.068	508.6	.04	1051.02	.052	1103.44	.047	1420.4	.06
3721.6	.06								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

508.6	1420.4	475	468	413	.3	.5
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Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	253.32	518.2	F

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 137740.*

Existing.rep

INPUT

Description:

Station Elevation Data				num=	117			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	575	62.87	557.21	132.37	527.79	172.08	517.3	
242.39	508.32	254.69	510.53	282.1	516.66	291.2	516.67	
320.16	517.05	344.15	512.54	363.85	512.75	409.51	513.14	
479.82	512.9	503.32	513.38	539.71	514.06	548.49	514.19	
642.8	512.36	664.31	505.75	672.92	504.92	703.9	492.18	
841.89	477.26	842.87	477.26	956.17	477.26	957.89	478.23	
979.08	478.23	984.25	477.26	1054.69	477.26	1079.52	479.18	
1240.92	484.43	1356.79	485.91	1398.17	486.43	1443.7	488.61	
1485.61	492.19	1521.2	502	1581.09	503.09	1598.96	505.83	
1689.67	508.27	1693.02	508.22	1776.47	509.82	1779.31	509.64	
1894.87	505.39	1927.68	505.39	1982.34	506.07	2017.02	506.84	
2126.99	509.48	2146.5	510.24	2212.38	512.33	2225.17	512.88	
2343.97	510.42	2380.85	510.62	2419.57	510.73	2472.65	510.42	
2515.79	510.11	2561.2	509.88	2606.12	509.52	2610.88	509.58	
2701.35	508.44	2702.68	508.44	2731.84	509.91	2777.94	510.07	
2863.36	511.99	2924.07	509.98	2931.1	509.72	2995.9	510.84	
3034.23	507.32	3040.08	507.31	3052.85	510.98	3080.34	510.55	
3094.71	510.84	3104.43	510.78	3126.03	510.34	3151.03	510.28	
3182.45	511.33	3203.78	511.4	3306.38	511.98	3385.22	512.72	
3419.78	514.47	3433.81	515.64	3452.45	517.2	3460.31	518	
3473.77	516.28	3477	515.94	3494.29	517.93	3496.45	518.83	
3518.23	521.16	3561.43	520.97	3565.57	521.16	3591.87	522.49	
3660.6	526.17	3686.53	528.56	3725.4	531.25	3765.36	542.93	
3781.36	545.12	3865.8	580					

Manning's n Values				num=	6			
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
0	.064	642.8	.04	1120.9	.052	1240.92	.05	
3865.8	.06							

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
642.8	1521.2	475	468	413	.1	.3	

Ineffective Flow			num=	1		
Sta L	Sta R	Elev	Permanent	F		
0	320.16	517.05				

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 137275

INPUT

Description: FEMA CT

Station Elevation Data				num=	70			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	575	76	556.1	160	523	208	512	
293	504.5	341	515.5	352	515.5	366	515.9	
416	510.2	495	510.9	580	510.5	663	512.1	
777	510.2	802	503	812	502.4	848	488	
1008.36	476.2	1058.36	476.2	1088.36	478.2	1138.36	480.2	
1423.36	482.2	1473.36	482.2	1528.36	484.2	1573.36	486.2	
1622	499.7	1683	501.2	1725	509.2	1797	507.8	
1951	504.5	2036	504.8	2127	506.5	2239	509.2	
2460	510.2	2537	510.7	2635	510.3	2727	508.4	
2902	508.9	2989	511	3058	507.9	3124	509.3	
3169	504.9	3182	509.5	3210	509	3282	508.5	
3314	509.7	3552	509.7	3589	513.5	3597	514.5	

				Existing.rep						
3956.92	523.34	3959.81	523.59	3962.81	523.83	3966.03	524.08	3973.42	524.44	
3998.82	525.26	3999.72	525.28	4024.08	526.65	4035.89	527.31	4041.05	527.77	
4063.6	529.76	4097.77	540.83	4106.18	543.48	4118.76	543.77	4122.86	545.3	
4202	575									

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .06 1027.17 .04 1890.77 .06		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
1027.17 1890.77	464.17 448.38 414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 136383.*

INPUT

Description:

Station Elevation Data			num=	231						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	575	27.48	571.2	57.19	567.6	94.2	561.27	124.94	553.26	
140.74	548.21	149.15	546.86	187.84	537.71	236.07	527.08	263.03	521.36	
276.44	519.42	310.64	514.51	331.95	512.43	339.24	511.75	341.94	511.51	
380.73	509.95	431.76	508.46	457.01	507.34	481.67	507.31	486.71	507.77	
543.34	513.16	560.58	514.77	578.66	514.77	592.13	514.92	601.68	515.02	
636.2	514.98	648.76	513.97	683.87	510.87	688.57	510.85	699.79	510.66	
708.76	510.69	718.85	511.23	750.81	511.17	760.34	512.11	763.71	512.25	
768.19	512.14	782.21	512.09	788.38	510.61	813.75	510.48	834.92	510.26	
883.7	509.8	941.46	509.09	953.48	509.07	964.45	509.15	1023.89	509.58	
1089.93	510.75	1091.17	510.77	1124.26	510.25	1162.38	510.13	1199.95	509.14	
1214.86	509.2	1233.6	508.55	1277.33	507.03	1292.26	502.61	1311.6	498.63	
1322.77	497.57	1325.3	497.42	1338.06	494.52	1374.64	487.17	1441.9	486.04	
1491.63	485.21	1545.75	481.36	1594.43	477.53	1707.76	477.53	1731.81	478.97	
1771.88	480.49	1856.34	481.84	1888.11	482.47	1935.58	482.87	2000.32	483.35	
2024.73	483.53	2039.47	484.03	2040.4	484.16	2056.3	486.85	2060.27	487.3	
2064.23	487.75	2068.19	488.21	2072.15	488.66	2076.11	489.11	2080.08	489.57	
2084.04	490.02	2084.48	490.07	2088	490.5	2091.96	490.98	2095.93	491.46	
2115.74	493.86	2120.49	494.36	2120.55	494.37	2125.07	495.88	2125.32	495.96	
2130.47	497.46	2135.31	498.88	2140.2	500.32	2145.04	501.75	2149.87	503.18	
2154.7	504.61	2159.54	506.03	2216.61	507.23	2255.91	512.7	2256.58	512.69	
2323.29	511.77	2341.48	512.07	2368.79	512.2	2382.11	512.09	2389.08	511.87	
2396.5	511.66	2402.82	511.53	2405.29	511.3	2419.68	510.18	2449.96	508.19	
2467.38	507.13	2504.42	506.99	2546.92	506.78	2548.48	506.79	2618.92	507.39	
2632.07	507.54	2736.87	509.15	2799.21	511.03	2830.44	511.71	2830.96	511.69	
2860.25	510.75	2883.45	509.94	2924.35	508.76	2943.66	508.31	3015.71	508.42	
3034.42	508.31	3066.75	508.22	3075.31	508.53	3078.65	508.85	3081.99	509.17	
3084.28	509.5	3087.41	509.82	3090.33	510.15	3093.05	510.48	3107.41	510.43	
3108.68	510.41	3110.47	510.05	3159.32	509.34	3161.72	509.63	3163.57	509.94	
3165.49	510.25	3180.85	510.02	3185.12	509.62	3189.52	509.23	3193.49	508.84	
3193.51	508.83	3284.25	509.1	3357.24	509.17	3438.65	510.57	3503.21	508.5	
3564.97	509.43	3580.87	506.5	3607.07	506.5	3619.24	509.57	3626.3	509.81	
3633.59	510.05	3645.44	509.9	3650.68	509.87	3664.13	509.81	3692.84	510	
3695.85	510.32	3698.85	510.64	3701.93	510.95	3704.85	511.27	3707.69	511.59	
3710.28	511.91	3712.81	511.9	3721.54	514	3727.78	515.41	3742.75	512.39	
3744.21	512.37	3752.7	512.03	3761.53	511.7	3770.85	511.37	3782.81	511.37	
3800.44	511.7	3814.39	512.03	3820.67	512.37	3826.1	512.7	3829.98	513.03	
3833.25	513.37	3836.08	513.7	3838.85	514.03	3841.62	514.37	3844.2	514.7	
3859.67	515.03	3886.18	515.37	3893.07	515.37	3927.01	515.03	3942.56	515.03	
3949.45	515.37	3965.45	515.5	3988.88	517.41	4000.07	518.37	4007.55	519.13	
4010.36	518.5	4015.81	518.15	4023.46	517.64	4051.49	521.14	4058.08	521.98	
4062.76	521.97	4079.37	521.98	4100.9	522.07	4103.93	522.11	4114.38	522.73	

Existing.rep									
4215.54	521	4220.8	520.79	4228.19	520.46	4255.26	523.28	4261.62	523.97
4266.14	524	4282.18	524.16	4302.97	524.48	4305.9	524.56	4315.99	525.22
4323.92	525.93	4328.75	526.56	4333.38	527.19	4333.91	527.26	4337.9	527.77
4341.78	528.33	4345.78	528.9	4349.04	529.45	4351.77	530	4354.5	530.54
4357.2	531.09	4359.9	531.63	4362.69	532.18	4365.71	532.73	4372.6	533.34
4396.31	534.24	4397.16	534.25	4419.9	535.07	4430.93	535.47	4435.74	536.14
4456.79	539.09	4488.69	548.38	4496.55	550.44	4508.29	551.31	4512.11	552.46
4586	575								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .06 1527.5 .04 2428.31 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1527.5 2428.31 464.17 448.38 414.17 .1 .3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 135491.*

INPUT

Description:

Station Elevation Data num= 231									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	38.24	571.55	79.6	568.85	131.1	561.78	173.88	550.41
195.87	544.1	207.58	543.43	261.42	534.41	328.53	524.69	366.06	519.73
384.72	517.71	432.32	512.65	461.97	511.46	472.12	511.13	475.87	511.02
529.87	510.42	600.88	510.78	636.02	510.17	670.34	510.11	677.35	510.33
756.17	513.23	780.16	514.03	805.33	514.03	824.06	514.11	837.36	514.14
885.4	514.06	902.88	513.53	951.75	511.55	958.29	511.48	973.89	511.03
986.38	511.04	1000.43	512.06	1044.91	511.79	1058.17	513.6	1062.85	513.88
1069.1	513.62	1088.61	513.44	1097.19	510.45	1132.49	510.06	1161.96	509.68
1229.85	508.9	1310.23	507.64	1326.96	507.63	1342.22	507.68	1424.94	507.84
1516.85	509.41	1518.59	509.44	1564.63	508.08	1617.69	507.47	1669.98	505.12
1690.73	505.11	1716.8	504.72	1777.67	503.87	1796.63	498.15	1821.19	494.26
1835.38	492.64	1838.61	492.43	1854.81	490.36	1901.29	486.33	1986.73	485.12
2049.91	484.23	2118.65	481.78	2180.49	478.87	2357.16	478.87	2375.25	479.75
2405.41	480.78	2468.95	482.02	2492.85	482.73	2528.57	483.53	2577.28	484.5
2595.64	484.87	2606.73	485.87	2607.43	486.12	2619.4	490.77	2622.38	491.5
2625.36	492.23	2628.35	492.95	2631.33	493.68	2634.31	494.41	2637.29	495.13
2640.27	495.86	2640.6	495.94	2643.25	496.6	2646.23	497.34	2649.21	498.08
2664.12	501.78	2667.69	502.53	2667.74	502.54	2671.14	503.77	2671.33	503.83
2675.21	505.08	2678.84	506.29	2682.53	507.51	2686.16	508.73	2689.8	509.94
2693.44	511.15	2697.07	512.37	2750.23	513.26	2786.83	516.2	2787.45	516.2
2849.57	515.73	2866.52	515.89	2891.95	515.45	2904.36	514.89	2910.85	514.28
2917.76	513.68	2923.64	513.25	2925.94	513	2939.34	511.94	2967.54	510.44
2983.77	509.75	3018.26	509.35	3057.84	508.76	3059.29	508.74	3124.89	508.55
3137.14	508.58	3234.73	509.1	3292.8	509.87	3321.87	509.71	3322.36	509.69
3349.64	508.73	3371.25	507.82	3409.34	506.73	3427.31	506.42	3494.41	506.15
3511.84	506.01	3541.95	505.96	3549.92	506.61	3553.03	507.28	3556.14	507.94
3558.28	508.6	3561.19	509.26	3563.91	509.92	3566.44	510.59	3579.81	510.57
3581	510.56	3582.66	509.88	3628.16	509.52	3630.4	510.17	3632.11	510.82
3633.91	511.47	3648.21	511.36	3652.18	510.66	3656.29	509.96	3659.98	509.27
3660	509.27	3744.51	509.4	3812.48	509.43	3888.29	510.13	3948.42	509.1
4005.93	509.57	4020.74	508.1	4045.14	508.1	4056.47	509.63	4063.05	510.26
4069.84	510.88	4080.87	510.8	4085.75	510.79	4098.28	510.75	4125.02	511.35
4127.82	512.01	4130.61	512.67	4133.49	513.33	4136.21	513.99	4138.85	514.65
4141.26	515.31	4143.61	515.3	4151.74	516.35	4157.56	516.92	4171.5	515.08
4172.86	515.03	4180.76	514.37	4188.99	513.7	4197.67	513.03	4208.8	513.03
4225.22	513.7	4238.21	514.37	4244.06	515.03	4249.12	515.7	4252.73	516.37
4255.78	517.03	4258.41	517.7	4260.99	518.37	4263.57	519.03	4265.98	519.7

Existing.rep									
4280.38	520.37	4305.08	521.03	4311.49	521.03	4343.1	520.37	4357.58	520.37
4363.99	521.03	4378.89	521.3	4400.71	522.56	4411.14	523.24	4418.11	523.76
4420.72	523.5	4425.79	523.43	4432.92	523.28	4459.02	525.42	4465.16	525.96
4469.52	526.04	4484.99	526.34	4505.04	526.88	4507.86	527.02	4517.6	527.71
4525.24	528.52	4529.9	529.27	4534.36	530.02	4534.88	530.11	4538.73	530.74
4542.47	531.45	4546.33	532.16	4549.47	532.87	4552.1	533.56	4554.74	534.26
4557.34	534.96	4559.94	535.65	4562.64	536.35	4565.54	537.05	4572.19	537.79
4595.06	538.72	4595.88	538.73	4617.81	539.28	4628.45	539.55	4633.09	540.33
4653.39	543.75	4684.16	552.15	4691.73	553.92	4703.06	555.09	4706.74	556.04
4778	575								

Manning's n Values					
Sta	n Val	Sta	num=	Sta	n Val
0	.06	1777.67	3	2697.07	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1777.67	2697.07		464.17	448.38	414.17	.1
							.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 135045.*

INPUT

Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	43.62	571.72	90.8	569.47	149.55	562.04	198.35	548.99
223.44	542.05	236.79	541.72	298.21	532.75	374.77	523.49	417.57	518.91
438.86	516.86	493.16	511.73	526.99	510.98	538.56	510.81	542.84	510.77
604.43	510.66	685.44	511.94	725.53	511.59	764.68	511.52	772.68	511.62
862.59	513.27	889.95	513.67	918.66	513.67	940.03	513.71	955.2	513.71
1010	513.6	1029.94	513.32	1085.69	511.88	1093.14	511.79	1110.95	511.21
1125.19	511.22	1141.21	512.48	1191.95	512.09	1207.09	514.35	1212.43	514.69
1219.55	514.36	1241.8	514.12	1251.6	510.38	1291.86	509.86	1325.48	509.39
1402.93	508.45	1494.61	506.92	1513.7	506.92	1531.11	506.94	1625.47	506.97
1730.31	508.74	1732.29	508.77	1784.81	506.99	1845.35	506.13	1904.99	503.11
1928.66	503.06	1958.4	502.81	2027.83	502.28	2048.82	495.93	2075.99	492.08
2091.69	490.17	2095.26	489.94	2113.18	488.28	2164.61	485.91	2259.15	484.66
2329.05	483.74	2405.11	481.99	2473.53	479.53	2681.86	479.53	2696.98	480.14
2722.17	480.92	2775.25	482.11	2795.22	482.87	2825.06	483.87	2865.76	485.08
2881.1	485.53	2890.37	486.78	2890.95	487.11	2900.95	492.74	2903.44	493.6
2905.93	494.46	2908.42	495.33	2910.91	496.19	2913.4	497.05	2915.89	497.92
2918.38	498.78	2918.66	498.88	2920.88	499.65	2923.37	500.52	2925.86	501.39
2938.31	505.74	2941.3	506.62	2941.33	506.63	2944.18	507.71	2944.34	507.76
2947.57	508.89	2950.61	510	2953.69	511.11	2956.73	512.21	2959.76	513.32
2962.8	514.43	2965.84	515.53	3017.04	516.27	3052.29	517.94	3052.89	517.95
3112.71	517.72	3129.03	517.79	3153.53	517.07	3165.48	516.3	3171.73	515.49
3178.38	514.69	3184.05	514.12	3186.26	513.85	3199.17	512.82	3226.33	511.57
3241.96	511.07	3275.18	510.52	3313.3	509.75	3314.69	509.72	3377.87	509.12
3389.67	509.11	3483.67	509.07	3539.59	509.28	3567.59	508.71	3568.06	508.7
3594.34	507.71	3615.14	506.76	3651.83	505.72	3669.14	505.47	3733.77	505.01
3750.55	504.85	3779.55	504.83	3787.22	505.66	3790.22	506.49	3793.21	507.32
3795.27	508.15	3798.08	508.98	3800.7	509.81	3803.13	510.64	3816.01	510.63
3817.16	510.63	3818.76	509.79	3862.58	509.61	3864.73	510.43	3866.39	511.26
3868.11	512.09	3881.89	512.03	3885.72	511.18	3889.67	510.33	3893.23	509.49
3893.25	509.48	3974.64	509.55	4040.1	509.57	4113.11	509.92	4171.02	509.4
4226.41	509.63	4240.68	508.9	4264.18	508.9	4275.09	509.67	4281.42	510.48
4287.96	511.29	4298.59	511.25	4303.29	511.24	4315.35	511.23	4341.11	512.02
4343.8	512.85	4346.5	513.68	4349.26	514.51	4351.88	515.34	4354.43	516.17
4356.75	517	4359.02	517	4366.85	517.52	4372.45	517.67	4385.87	516.42
4387.19	516.37	4394.8	515.53	4402.72	514.7	4411.08	513.87	4421.8	513.87

Existing.rep											
4437.62	514.7	4450.13	515.53	4455.76	516.37	4460.63	517.2	4464.11	518.03		
4467.04	518.87	4469.58	519.7	4472.07	520.53	4474.55	521.37	4476.87	522.2		
4490.74	523.03	4514.52	523.87	4520.7	523.87	4551.15	523.03	4565.09	523.03		
4571.27	523.87	4585.62	524.2	4606.63	525.13	4616.67	525.68	4623.38	526.08		
4625.9	526	4630.79	526.06	4637.65	526.1	4662.79	527.56	4668.7	527.95		
4672.9	528.07	4687.8	528.52	4707.11	529.29	4709.83	529.47	4719.2	530.21		
4726.57	531.11	4731.06	531.99	4735.35	532.86	4735.85	532.96	4739.55	533.72		
4743.16	534.58	4746.87	535.43	4749.9	536.28	4752.44	537.13	4754.97	537.98		
4757.48	538.83	4759.99	539.68	4762.58	540.53	4765.38	541.38	4771.79	542.25		
4793.81	543.21	4794.59	543.22	4815.72	543.49	4825.96	543.62	4830.43	544.51		
4849.99	548.41	4879.62	555.93	4886.91	557.39	4897.82	558.86	4901.37	559.62		
4970	575										

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	2027.83	.04	2965.84	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	2027.83	2965.84		464.17	448.38	414.17		.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 134600

INPUT

Description: FEMA CS topo
 Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49	571.9	102	570.1	168	562.3	251	540
266	540	335	531.1	421	522.3	493	516	554	510.8
592	510.5	605	510.5	679	510.9	770	513.1	868	512.9
969	513.3	1056	513.3	1157	513.1	1228	512.1	1248	511.4
1264	511.4	1282	512.9	1339	512.4	1356	515.1	1362	515.5
1370	515.1	1395	514.8	1406	510.3	1489	509.1	1576	508
1679	506.2	1720	506.2	1826	506.1	1946	508.1	2005	505.9
2073	504.8	2140	501.1	2200	500.9	2278	500.7	2301	493.7
2348	487.7	2371.56	486.2	2531.56	484.2	2691.56	482.2	2766.56	480.2
3006.56	480.2	3081.56	482.2	3121.56	484.2	3166.56	486.2	3174	487.7
3182.5	494.7	3184.5	495.7	3186.5	496.7	3188.5	497.7	3190.5	498.7
3192.5	499.7	3194.5	500.7	3196.5	501.7	3198.5	502.7	3200.5	503.7
3202.5	504.7	3212.5	509.7	3214.9	510.7	3217.34	511.7	3219.94	512.7
3222.38	513.7	3224.85	514.7	3227.29	515.7	3229.73	516.7	3232.17	517.7
3234.61	518.7	3318.32	519.7	3391.55	519.7	3415.11	518.7	3426.6	517.7
3432.61	516.7	3439.01	515.7	3446.59	514.7	3459	513.7	3485.12	512.7
3532.1	511.7	3570.1	510.7	3630.86	509.7	3786.38	508.7	3813.76	507.7
3839.03	506.7	3859.04	505.7	3894.32	504.7	3989.26	503.7	4017.15	503.7
4024.53	504.7	4027.41	505.7	4030.29	506.7	4032.27	507.7	4034.97	508.7
4037.49	509.7	4039.83	510.7	4053.32	510.7	4054.86	509.7	4097	509.7
4099.07	510.7	4100.66	511.7	4102.32	512.7	4115.57	512.7	4119.25	511.7
4123.05	510.7	4126.49	509.7	4493.71	509.7	4499.8	510.7	4506.09	511.7
4520.83	511.7	4532.43	511.7	4557.2	512.7	4559.79	513.7	4562.38	514.7
4565.04	515.7	4567.56	516.7	4570.01	517.7	4572.24	518.7	4581.95	518.7
4601.51	517.7	4608.83	516.7	4616.45	515.7	4624.49	514.7	4634.8	514.7
4650.01	515.7	4662.04	516.7	4667.46	517.7	4672.14	518.7	4675.49	519.7
4678.31	520.7	4680.75	521.7	4683.14	522.7	4685.53	523.7	4687.76	524.7
4701.1	525.7	4723.97	526.7	4729.91	526.7	4759.19	525.7	4772.6	525.7
4778.54	526.7	4812.55	527.7	4835.78	528.7	4866.56	529.7	4890.61	530.7
4909.18	531.7	4920.81	532.7	4927.89	533.7	4932.21	534.7	4936.34	535.7
4940.38	536.7	4943.85	537.7	4947.42	538.7	4950.33	539.7	4952.77	540.7
4955.21	541.7	4957.62	542.7	4960.03	543.7	4962.53	544.7	4965.22	545.7
4971.38	546.7	4992.56	547.7	5013.63	547.7	5023.48	547.7	5027.78	548.7

5075.08	559.7	5096	563.2	Existing.rep 5162	575
Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.06	2278	.04	3234.61	.06
Bank Sta: Left Right Lengths: Left Channel Right					
	2278	3234.61	1080.55	1139.54	1175.03
Ineffective Flow num= 1					
Sta L	Sta R	Elev	Permanent		
3391.55	5162	519.7	F		

Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 133431

INPUT

Description: XS of Ex Intake Structure topo

Station Elevation Data			num= 179
Sta	Elev	Sta	Elev
20	575	63.88	563.59
133.63	552.32	170.45	547.05
299.29	526.16	320	524.5
461.49	513.93	498.94	510.55
578.58	509.93	628.06	510.03
748.5	516.87	797.31	517.8
965.67	525.01	967.26	525.03
1119.7	517.26	1129.73	514.84
1142.48	515.07	1151.94	514.47
1219.1	505.71	1234.33	506.35
1269.25	506.2	1279.1	504.7
1426.02	504.96	1431.34	504.99
1626.73	505.31	1655.22	504.33
1783.89	505.87	1815.52	505.43
1936.42	502.83	1990.15	501.78
2268.3	490.51	2282.3	488
2415.8	480.2	2475.8	478.2
2722	472.5	2965.8	472.5
3089.8	524.7	3261.44	524.7
3352.9	520.7	3377.31	519.7
3441.75	515.7	3464.95	508.7
3760.07	514.7	3797.72	515.7
3926.25	519.7	4036.52	520.7
4081.99	521.7	4088.88	521.7
4111.08	523.7	4121.65	524.7
4237.77	528.7	4254.01	529.7
4274.9	533.7	4276.76	534.7
4337.33	538.7	4381.16	545.7
4503.16	544.7	4504.55	545.7
4566.02	559.7	4573.83	560.7
4605.2	564.7	4636.09	566.7
4709.38	570.7	4728.91	571.7
4889.06	581.7	4990.46	589.7
5091.75	601.7	5109.58	602.7
5272.62	606.7	5283.39	607.7
5365.7	611.7	5380.05	612.7
			579.47
			536.83
			520.87
			510.25
			518.05
			510.25
			525.54
			515.07
			514.2
			506.37
			504.56
			505.37
			504.09
			505.3
			501.77
			486.2
			476.2
			510.98
			523.7
			518.7
			508.7
			516.7
			521.7
			521.7
			525.7
			530.7
			535.7
			544.7
			556.7
			561.7
			567.7
			574.7
			596.7
			603.7
			608.7
			613.7
			559.49
			532.63
			518.87
			509.9
			514.07
			523.49
			525.55
			515.07
			512.46
			506.43
			505.43
			505.33
			505.58
			504.71
			503.9
			484.2
			474.2
			511.32
			522.7
			517.7
			512.7
			517.7
			522.7
			521.7
			526.7
			531.7
			536.7
			544.7
			557.7
			562.7
			568.7
			578.7
			599.7
			604.7
			609.7
			614.7

Manning's n Values			num= 4
Sta	n Val	Sta	n Val
20	.08	2225.73	.04
			2965.8
			.014
			3261.44
			.08

Bank Sta: Left	Right	Existing.rep	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2225.73	3089.8		305.73	294.78	300.13	.1	.3
Ineffective Flow	num=	2					
Sta L Sta R Elev	Permanent						
20 1036.12 525.54	F						
3089.8 5434.83 524.7	F						
Blocked Obstructions	num=	1					
Sta L Sta R Elev							
2965.8 3089.8 546.76							

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 133138

INPUT

Description: XS of Prop Intake Structure topo

Station	Elevation	Data	num=	226
Sta	Elev	Sta	Elev	Sta
0	580	98.84	575	142.72
190.18	556.9	212.47	552.32	249.29
337.05	531.53	378.13	526.16	398.84
527.87	515.07	540.33	513.93	577.78
640.63	509.9	657.42	509.93	706.9
788.39	515.34	827.34	516.87	876.15
970.7	523.77	1044.51	525.01	1046.1
1163.97	525.35	1198.54	517.26	1208.57
1217.07	515.07	1221.32	515.07	1230.78
1270.17	506.29	1297.94	505.71	1313.17
1325.71	506.3	1348.09	506.2	1357.94
1432.27	505.36	1504.86	504.96	1510.18
1639.14	505.33	1705.57	505.31	1734.06
1841.53	506.05	1862.73	505.87	1894.36
2003.97	503.27	2015.26	502.83	2068.99
2160.5	501.66	2181.41	490.51	2198.91
2398.91	480.2	2498.91	478.2	2543.91
2973.91	486.2	2976.86	490	2978.86
2983.4	496.7	2985.27	497.7	2987.36
2995.31	501.7	3003.52	502.7	3023.06
3054.64	505.7	3064.74	504.7	3073.57
3090.68	500.7	3092.23	499.7	3093.87
3098.77	498.7	3099.95	499.7	3101.11
3120.1	502.7	3124.47	501.7	3133.93
3238.01	498.7	3249.73	499.7	3256.95
3281.85	503.7	3300.95	504.7	3384.78
3433.64	503.7	3444.23	502.7	3455.37
3506.45	499.7	3511.98	500.7	3517.93
3545.04	504.7	3572.29	505.7	3587.37
3614.76	508.7	3618.22	507.7	3672.45
3695.96	510.7	3774.53	511.7	3799.9
3895.52	514.7	3919.17	515.7	3947.84
3977.73	515.7	3988.88	516.7	4017.67
4149.71	520.7	4186.51	520.7	4194.94
4215.79	524.7	4218.26	525.7	4220.73
4343.39	529.7	4388.9	530.7	4408.11
4434.29	539.7	4443.63	540.7	4464.88
4587.03	542.7	4622.7	543.7	4663.66
4738.93	546.7	4770.52	547.7	4776.57
4894.9	565.7	4931.02	566.7	4934.35
4944.79	570.7	4949.17	571.7	4953.86
4972.29	575.7	5002.27	576.7	5059.83
5145.44	581.7	5161.37	582.7	5176.5
			583.7	5191.22
			584.7	5206.88
			585.7	5223.41
			586.7	5239.72
			587.7	5256.03
			588.7	5272.34
			589.7	5288.65
			590.7	5304.96
			591.7	5321.27
			592.7	5337.58
			593.7	5353.89
			594.7	5370.20
			595.7	5386.51
			596.7	5402.82
			597.7	5419.13
			598.7	5435.44
			599.7	5451.75
			600.7	5468.06
			601.7	5484.37
			602.7	5500.68
			603.7	5516.99
			604.7	5533.30
			605.7	5549.61
			606.7	5565.92
			607.7	5582.23
			608.7	5598.54
			609.7	5614.85
			610.7	5631.16
			611.7	5647.47
			612.7	5663.78
			613.7	5680.09
			614.7	5696.40
			615.7	5712.71
			616.7	5729.02
			617.7	5745.33
			618.7	5761.64
			619.7	5777.95
			620.7	5794.26
			621.7	5810.57
			622.7	5826.88
			623.7	5843.19
			624.7	5859.50
			625.7	5875.81
			626.7	5892.12
			627.7	5908.43
			628.7	5924.74
			629.7	5941.05
			630.7	5957.36
			631.7	5973.67
			632.7	5989.98
			633.7	6006.29
			634.7	6022.60
			635.7	6038.91
			636.7	6055.22
			637.7	6071.53
			638.7	6087.84
			639.7	6104.15
			640.7	6120.46
			641.7	6136.77
			642.7	6153.08
			643.7	6169.39
			644.7	6185.70
			645.7	6202.01
			646.7	6218.32
			647.7	6234.63
			648.7	6250.94
			649.7	6267.25
			650.7	6283.56
			651.7	6299.87
			652.7	6316.18
			653.7	6332.49
			654.7	6348.80
			655.7	6365.11
			656.7	6381.42
			657.7	6397.73
			658.7	6414.04
			659.7	6430.35
			660.7	6446.66
			661.7	6462.97
			662.7	6479.28
			663.7	6495.59
			664.7	6511.90
			665.7	6528.21
			666.7	6544.52
			667.7	6560.83
			668.7	6577.14
			669.7	6593.45
			670.7	6609.76
			671.7	6626.07
			672.7	6642.38
			673.7	6658.69
			674.7	6675.00
			675.7	6691.31
			676.7	6707.62
			677.7	6723.93
			678.7	6740.24
			679.7	6756.55
			680.7	6772.86
			681.7	6789.17
			682.7	6805.48
			683.7	6821.79
			684.7	6838.10
			685.7	6854.41
			686.7	6870.72
			687.7	6887.03
			688.7	6903.34
			689.7	6919.65
			690.7	6935.96
			691.7	6952.27
			692.7	6968.58
			693.7	6984.89
			694.7	7001.20
			695.7	7017.51
			696.7	7033.82
			697.7	7050.13
			698.7	7066.44
			699.7	7082.75
			700.7	7099.06
			701.7	7115.37
			702.7	7131.68
			703.7	7147.99
			704.7	7164.30
			705.7	7180.61
			706.7	7196.92
			707.7	7213.23
			708.7	7229.54
			709.7	7245.85
			710.7	7262.16
			711.7	7278.47
			712.7	7294.78
			713.7	7311.09
			714.7	7327.40
			715.7	7343.71
			716.7	7360.02
			717.7	7376.33
			718.7	7392.64
			719.7	7408.95
			720.7	7425.26
			721.7	7441.57
			722.7	7457.88
			723.7	7474.19
			724.7	7490.50
			725.7	7506.81
			726.7	7523.12
			727.7	7539.43
			728.7	7555.74
			729.7	7572.05
			730.7	7588.36
			731.7	7604.67
			732.7	7620.98
			733.7	7637.29
			734.7	7653.60
			735.7	7669.91
			736.7	7686.22
			737.7	7702.53
			738.7	7718.84
			739.7	7735.15
			740.7	7751.46
			741.7	7767.77
			742.7	7784.08
			743.7	7800.39
			744.7	7816.70
			745.7	7833.01
			746.7	7849.32
			747.7	7865.63
			748.7	7881.94
			749.7	7898.25
			750.7	7914.56
			751.7	7930.87
			752.7	7947.18
			753.7	7963.49
			754.7	7979.80
			755.7	7996.11
			756.7	8012.42
			757.7	8028.73
			758.7	8045.04
			759.7	8061.35
			760.7	8077.66
			761.7	8093.97
			762.7	8110.28
			763.7	8126.59
			764.7	8142.90
			765.7	8159.21
			766.7	8175.52
			767.7	8191.83
			768.7	820

				Existing.rep					
5220.4	586.7	5232.98	587.7	5256.94	588.7	5271.66	589.7	5310.61	590.7
5322.52	591.7	5359.54	592.7	5387.25	593.7	5422.32	594.7	5435.44	595.7
5508.65	600.7								

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	Sta n Val
0 .08 2138.84	.04 3054.64	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2138.84	3054.64	688.72	690.68	684.84	.1 .3
Ineffective Flow	num=	2			
Sta L Sta R Elev	Permanent				
0 1134.96 525.54	F				
3054.64 5508.65 524	T				

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 132450

INPUT

Description: FEMA CR topo

Station Elevation Data	num=	121
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 575 56 553.9 72 553.9 107 544.9 190 531.8		
263 522.2 331 518.7 404 514 451 509.6 526 509.6		
595 509.6 625 514.9 686 518.8 743 520.6 821 529		
892 530.9 979 531.8 1003 531.7 1045 516.4 1052 516.9		
1053 516.9 1057 516.9 1074 515.2 1103 503.1 1146 501.9		
1210 501.9 1244 503.5 1324 503.4 1410 504.9 1513 504.9		
1548 503 1602 504.7 1661 505.2 1712 505.2 1794 504		
1856 502.2 1921 505.5 1950 503.2 1978 487.5 1980 486.2		
2051.61 484.2 2161.61 482.2 2236.61 480.2 2336.61 478.2 2386.61 476.2		
2466.61 474.2 2486.61 472.2 2511.61 470.2 2566.61 470.2 2581.61 472.2		
2596.61 474.2 2646.61 476.2 2696.61 478.2 2736.61 480.2 2751.61 482.2		
2786.61 484.2 2811.61 486.2 2816 487.5 2831 493.7 2832.37 494.7		
2846.86 505.7 2849.12 506.7 2895.98 506.7 2898.51 506.7 2909.09 507.7		
2919.39 508.7 2957.66 509.7 2974.43 510.7 2991.15 511.7 3019.84 512.7		
3078.44 512.7 3125.14 511.7 3154.27 510.7 3176.64 509.7 3192.45 508.7		
3203.88 507.7 3215.51 506.7 3367.67 506.7 3373.19 507.7 3377.33 508.7		
3392.87 508.7 3396.25 507.7 3449.4 507.7 3451.23 508.7 3483.19 509.7		
3679.6 510.7 3772.97 511.7 3816.173 512.7 3880.26 513.7 3927.32 514.7		
3946.35 515.7 3951.57 516.7 3955.62 517.7 3965.1 518.7 3971.56 518.7		
3975.93 518.7 3981.62 519.7 3983.08 519.7 3993.16 518.7 3996.51 517.7		
4002.79 517.7 4026 521.4 4107 524.9 4175 526.9 4213 527.5		
4223 527.5 4305 530.8 4377 534.2 4473 537 4535 540.1		
4547 541.9 4584 541.9 4596 541 4602 544.1 4648 546.6		
4740 556.2 4831 565 4862 570.9 4908 573.5 4923 573.5		
4933 575		

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	Sta n Val
0 .08 1921	.04 2849.12	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1921	2849.12	406	410	329.99	.1 .3
Ineffective Flow	num=	2			
Sta L Sta R Elev	Permanent				
0 979 531.8	F				
3078.44 4933 515	F				

CROSS SECTION

Existing.rep

RIVER: Susquehanna
 REACH: 1

RS: 132040.*

INPUT

Description:

Station Elevation Data

num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	53.07	556.53	68.23	556.08	101.4	547.89	129.66	543.27
180.05	535.39	249.23	526.11	254.19	525.78	313.67	522.31	371.01	518.34
382.84	517.54	427.38	513.43	476.28	512.78	494.26	513.08	498.45	513.08
537.9	513.08	563.84	512.64	566.15	512.94	592.27	516.55	650.08	519.03
685.54	519.59	704.09	519.95	778.01	526.13	788.24	526.29	845.29	527.1
894.79	527.11	927.73	527.16	950.47	526.91	990.27	514.37	994.93	514.62
996.91	514.72	997.86	514.71	1001.65	514.67	1017.76	513.15	1036.01	506.53
1045.24	503.43	1085.99	503.12	1089.93	503.18	1146.63	503.42	1178.85	504.84
1206.75	504.93	1254.66	505.5	1292.77	506.56	1308.17	506.21	1331.28	507.13
1336.16	507.2	1342.83	507.2	1354.39	507.2	1399.32	504.38	1433.77	504.18
1466.93	502.47	1504.59	503.26	1518.11	503.15	1552.09	502.22	1574.02	502.86
1622.34	503.93	1653.51	504.23	1700.05	504.08	1739.52	503.47	1758.8	502.7
1820.4	504.38	1847.21	500.82	1857.56	495.14	1873.09	487.3	1874.94	486.22
1875.91	486.18	1941.14	484.52	2042.82	482.79	2112.15	481.1	2188.01	479.69
2204.59	479.36	2250.81	477.66	2324.76	475.89	2343.25	474.25	2366.36	472.6
2425.36	472.6	2443.97	474.31	2462.58	476.02	2492.92	476.98	2524.62	477.8
2549.21	478.43	2586.66	479.4	2636.29	481	2654.91	482.6	2698.33	484.2
2729.35	485.8	2734.8	486.84	2735	486.89	2751.89	491.79	2753.38	492.39
2753.41	492.4	2755.11	493.41	2773.09	504.4	2775.9	505.54	2825.2	506.22
2827.86	506.26	2833.48	506.74	2838.99	507.16	2849.83	508	2890.09	508.94
2907.74	509.8	2908.6	509.84	2925.33	510.78	2951.16	511.74	2955.51	511.86
2962.01	511.86	3001.24	511.76	3017.17	511.78	3054.65	511.23	3066.3	511.03
3096.95	510.2	3120.49	509.38	3121.42	509.34	3137.12	508.58	3149.15	507.78
3161.38	506.98	3194.87	506.98	3256.63	506.94	3317.55	506.8	3321.48	506.73
3327.28	507.43	3331.64	508.15	3340.92	507.98	3347.99	508.02	3351.55	507.24
3395.17	507.5	3407.47	507.51	3409.39	508.31	3443.02	509.14	3461.11	509.23
3513.69	508.97	3569.6	509.19	3594.64	509.39	3613	510.32	3624.69	509.44
3649.67	509.54	3659.74	509.62	3673.93	510.98	3683.11	509.85	3691.46	509.88
3732.35	510.21	3747.9	510.35	3784.93	511.03	3793.36	511.22	3854.2	512.2
3860.79	512.29	3901.78	513.02	3910.3	513.58	3930.32	515.38	3935.81	516.45
3940.07	517.46	3950.05	518.75	3950.18	518.76	3956.84	518.81	3961.44	518.85
3962.7	519.03	3965.21	519.36	3967.43	519.66	3967.71	519.66	3968.96	519.65
3976.89	518.96	3979.57	518.67	3983.09	517.75	3989.7	517.52	3994.42	517.93
4014.12	520.71	4036.15	521.86	4088.73	523.75	4099.34	524.24	4148.82	526.03
4170.89	526.58	4199.73	527.01	4210.87	527.18	4221.39	527.21	4236.45	527.72
4294.04	529.86	4307.67	530.4	4336.6	531.68	4369.15	532.85	4383.42	533.46
4423.4	534.63	4484.42	536.6	4486	536.68	4508.53	539.04	4520.22	539.66
4549.65	540.78	4552.77	541.14	4559.44	541.84	4562.28	542.14	4601.21	541.85
4613.83	541.03	4615.36	541.62	4620.15	543.63	4651.25	545.73	4668.54	547.88
4685.47	550.62	4732.21	554.97	4755.58	556.99	4765.34	557.76	4768.93	558.02
4804.82	560.7	4844.88	563.65	4861.08	564.72	4893.7	569.19	4899.96	569.41
4938.35	571.32	4942.1	571.77	4957.88	572.99	4968.4	575		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1820.4	.04	2775.9	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1820.4	2775.9		406	410	329.99	.1
							.3

CROSS SECTION

RIVER: Susquehanna

REACH: 1

Existing.rep
RS: 131630.*

INPUT

Description:

Station Elevation Data		num= 209									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	50.13	559.16	64.46	558.26	95.79	550.87	122.5	546.36		
170.1	538.99	235.45	530.03	240.14	529.64	296.33	525.93	350.51	521.88		
361.69	521.09	403.76	517.26	449.96	515.96	466.94	516.56	470.91	516.56		
508.18	516.56	532.68	515.68	534.86	515.86	559.54	518.2	614.15	519.26		
647.65	519.19	665.18	519.29	735.01	523.27	744.68	523.29	798.57	523.3		
845.35	522.78	876.46	522.51	897.95	522.12	935.55	512.35	939.95	512.49		
941.82	512.54	942.71	512.52	946.29	512.44	961.51	511.09	978.76	505.9		
987.47	503.75	1025.97	504.33	1029.7	504.46	1083.27	504.95	1113.71	506.18		
1140.06	506.4	1185.33	507.61	1221.32	509.02	1235.88	508.03	1257.71	509.45		
1262.32	509.5	1268.63	509.5	1279.54	509.5	1321.99	503.86	1354.53	503.47		
1385.87	501.95	1421.44	502.27	1434.21	501.61	1466.32	499.44	1487.03	500.53		
1532.69	502.66	1562.13	503.75	1606.1	504.16	1643.39	504.15	1661.61	503.2		
1719.8	503.26	1744.42	498.45	1753.92	493.35	1768.18	487.09	1769.88	486.24		
1770.77	486.18	1830.66	484.83	1924.03	483.37	1987.69	481.99	2057.35	480.82		
2072.57	480.53	2115.01	479.12	2182.91	477.59	2199.89	476.3	2221.11	475		
2284.11	475	2306.33	476.42	2328.55	477.84	2364.77	478.79	2402.63	479.4		
2432	479.88	2476.71	480.6	2535.98	481.8	2558.2	483	2610.06	484.2		
2647.1	485.4	2653.6	486.18	2653.83	486.22	2674	490.39	2675.78	491.09		
2675.83	491.11	2677.86	492.12	2699.32	503.1	2702.67	504.38	2754.42	505.75		
2757.21	505.82	2763.11	506.28	2768.89	506.62	2780.27	507.29	2822.53	508.17		
2841.05	508.89	2841.95	508.93	2859.51	509.86	2886.62	510.93	2891.19	511.02		
2898.01	511.02	2939.18	510.82	2955.9	510.87	2995.24	510.52	3007.47	510.36		
3039.63	509.7	3064.34	509.06	3065.32	509.03	3081.79	508.46	3094.42	507.86		
3107.26	507.26	3142.4	507.26	3207.22	507.18	3271.17	506.9	3275.28	506.76		
3281.38	507.15	3285.95	507.59	3295.69	507.26	3303.11	507.34	3306.84	506.79		
3352.63	507.3	3365.53	507.32	3367.55	507.93	3402.84	508.59	3421.83	508.67		
3477.01	507.91	3535.7	508.07	3561.98	508.34	3581.25	510.11	3593.52	508.31		
3619.73	508.38	3630.31	508.44	3645.2	511.01	3654.83	508.66	3663.59	508.64		
3706.51	508.89	3722.83	509	3761.7	509.55	3770.54	509.73	3834.4	510.8		
3841.31	510.88	3884.33	511.52	3893.28	512.47	3914.29	515.05	3920.05	516.19		
3924.53	517.22	3934.99	518.81	3935.14	518.82	3942.13	518.93	3946.95	519		
3948.28	519.15	3950.9	519.4	3953.24	519.62	3953.53	519.62	3954.85	519.59		
3963.17	518.97	3965.98	518.64	3969.68	517.8	3976.61	517.34	3981.56	517.45		
4002.24	520.01	4025.36	521.42	4080.55	523.04	4091.69	523.59	4143.61	525.77		
4166.78	526.26	4197.05	526.68	4208.74	526.85	4219.78	526.92	4235.59	527.37		
4296.03	529.45	4310.33	529.99	4340.7	531.26	4374.87	532.14	4389.84	532.72		
4431.8	533.95	4495.84	536.21	4497.5	536.28	4521.15	539.93	4533.41	540.62		
4564.31	541.46	4567.58	541.73	4574.58	542.18	4577.56	542.38	4618.42	541.79		
4631.67	541.06	4633.27	541.49	4638.29	543.15	4670.94	545.74	4689.09	549.15		
4706.85	552.97	4755.91	557.03	4780.43	558.74	4790.68	559.32	4794.45	559.52		
4832.11	561.58	4874.16	563.79	4891.17	564.43	4925.4	567.48	4931.97	567.58		
4972.27	569.34	4976.19	570.04	4992.76	572.48	5003.8	575				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1719.8	.04	2702.67	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1719.8 2702.67 406 410 329.99 .1 .3

CROSS SECTION

RIVER: Susquehanna
REACH: 1

RS: 131220.*

INPUT

Existing.rep

Description:

Station Elevation Data				num=	209				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	47.2	561.8	60.69	560.43	90.19	553.86	115.33	549.44
160.15	542.58	221.68	533.94	226.09	533.49	279	529.54	330.01	525.42
340.53	524.63	380.15	521.09	423.64	519.14	439.63	520.04	443.36	520.04
478.45	520.04	501.52	518.72	503.57	518.77	526.81	519.85	578.23	519.5
609.77	518.79	626.27	518.64	692.02	520.4	701.12	520.3	751.86	519.49
795.9	518.46	825.19	517.87	845.42	517.33	880.82	510.32	884.96	510.36
886.72	510.36	887.57	510.33	890.94	510.21	905.27	509.04	921.51	505.27
929.71	504.08	965.96	505.55	969.46	505.74	1019.9	506.47	1048.56	507.52
1073.38	507.87	1115.99	509.71	1149.88	511.48	1163.59	509.85	1184.14	511.76
1188.48	511.8	1194.42	511.8	1204.69	511.8	1244.66	503.34	1275.3	502.75
1304.8	501.42	1338.3	501.28	1350.32	500.06	1380.54	496.66	1400.05	498.19
1443.04	501.4	1470.75	503.27	1512.15	504.25	1547.26	504.84	1564.41	503.7
1619.2	502.14	1641.62	496.07	1650.28	491.57	1663.27	486.89	1664.82	486.26
1665.63	486.19	1720.19	485.15	1805.24	483.96	1863.23	482.89	1926.68	481.94
1940.55	481.69	1979.21	480.58	2041.06	479.28	2056.52	478.36	2075.85	477.4
2142.85	477.4	2168.69	478.53	2194.53	479.66	2236.63	480.59	2280.65	481
2314.78	481.32	2366.77	481.8	2435.66	482.6	2461.5	483.4	2521.78	484.2
2564.84	485	2572.4	485.52	2572.67	485.55	2596.12	489	2598.19	489.8
2598.24	489.81	2600.6	490.83	2625.56	501.8	2629.45	503.22	2683.64	505.27
2686.56	505.39	2692.74	505.82	2698.8	506.08	2710.71	506.59	2754.96	507.41
2774.35	507.99	2775.3	508.02	2793.69	508.94	2822.08	510.12	2826.86	510.18
2834.01	510.18	2877.12	509.88	2894.63	509.95	2935.83	509.81	2948.63	509.69
2982.32	509.21	3008.18	508.74	3009.21	508.72	3026.47	508.34	3039.68	507.94
3053.13	507.54	3089.93	507.54	3157.81	507.42	3224.78	507	3229.09	506.79
3235.47	506.88	3240.26	507.04	3250.46	506.54	3258.23	506.67	3262.14	506.33
3310.09	507.1	3323.6	507.13	3325.71	507.54	3362.67	508.03	3382.55	508.12
3440.34	506.84	3501.8	506.95	3529.32	507.29	3549.5	509.91	3562.34	507.17
3589.8	507.22	3600.87	507.26	3616.46	511.04	3626.56	507.48	3635.73	507.39
3680.68	507.56	3697.77	507.66	3738.47	508.07	3747.73	508.25	3814.6	509.4
3821.84	509.47	3866.89	510.01	3876.25	511.35	3898.26	514.73	3904.3	515.94
3908.98	516.98	3919.94	518.86	3920.09	518.88	3927.41	519.04	3932.47	519.15
3933.85	519.26	3936.6	519.43	3939.05	519.58	3939.35	519.58	3940.73	519.54
3949.45	518.98	3952.39	518.6	3956.26	517.84	3963.53	517.16	3968.71	516.97
3990.37	519.32	4014.57	520.98	4072.36	522.33	4084.03	522.93	4138.41	525.51
4162.67	525.94	4194.37	526.35	4206.61	526.53	4218.17	526.63	4234.73	527.01
4298.02	529.03	4312.99	529.59	4344.8	530.84	4380.58	531.42	4396.25	531.98
4440.2	533.26	4507.27	535.81	4509	535.89	4533.77	540.82	4546.61	541.58
4578.96	542.14	4582.38	542.32	4589.72	542.52	4592.84	542.62	4635.62	541.74
4649.5	541.09	4651.18	541.36	4656.44	542.68	4690.63	545.76	4709.63	550.43
4728.23	555.31	4779.6	559.09	4805.29	560.49	4816.02	560.88	4819.96	561.01
4859.41	562.45	4903.44	563.92	4921.25	564.15	4957.1	565.76	4963.98	565.75
5006.18	567.36	5010.29	568.31	5027.64	571.96	5039.2	575		

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1619.2	.04	2629.45	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1619.2	2629.45		406	410	329.99	.1 .3

CROSS SECTION

RIVER: Susquehanna

REACH: 1

RS: 130810.*

INPUT

Description:

Station Elevation Data				num=	209				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

Existing.rep									
0	575	44.27	564.43	56.92	562.61	84.59	556.84	108.17	552.52
150.2	546.18	207.91	537.86	212.05	537.35	261.66	533.16	309.5	528.96
319.37	528.17	356.53	524.92	397.32	522.32	412.31	523.52	415.82	523.52
448.73	523.52	470.36	521.76	472.29	521.69	494.08	521.5	542.3	519.73
571.88	518.4	587.36	517.99	649.02	517.54	657.56	517.3	705.15	515.69
746.45	514.13	773.92	513.23	792.9	512.53	826.1	508.3	829.98	508.23
831.63	508.18	832.42	508.14	835.59	507.99	849.02	506.99	864.25	504.63
871.95	504.41	905.94	506.77	909.23	507.02	956.54	507.99	983.41	508.86
1006.69	509.33	1046.66	511.82	1078.44	513.94	1091.29	511.68	1110.57	514.08
1114.64	514.1	1120.21	514.1	1129.85	514.1	1167.33	502.82	1196.07	502.03
1223.73	500.9	1255.15	500.29	1266.42	498.51	1294.77	493.88	1313.06	495.86
1353.38	500.13	1379.38	502.78	1418.2	504.33	1451.13	505.52	1467.22	504.2
1518.6	501.02	1538.83	493.69	1546.64	489.78	1558.36	486.68	1559.76	486.28
1560.49	486.19	1609.71	485.47	1686.45	484.54	1738.77	483.79	1796.02	483.07
1808.52	482.85	1843.4	482.04	1899.21	480.97	1913.16	480.41	1930.6	479.8
2001.6	479.8	2031.05	480.64	2060.5	481.48	2108.49	482.4	2158.66	482.6
2197.57	482.76	2256.82	483	2335.34	483.4	2364.79	483.8	2433.5	484.2
2482.58	484.6	2491.2	484.86	2491.51	484.87	2518.23	487.6	2520.59	488.5
2520.65	488.52	2523.34	489.54	2551.79	500.5	2556.22	502.06	2612.85	504.8
2615.91	504.95	2622.37	505.36	2628.7	505.54	2641.15	505.89	2687.39	506.64
2707.66	507.09	2708.65	507.11	2727.87	508.02	2757.54	509.31	2762.54	509.34
2770	509.34	2815.06	508.94	2833.36	509.04	2876.41	509.11	2889.79	509.02
2925	508.71	2952.03	508.42	2953.11	508.41	2971.14	508.22	2984.95	508.02
2999.01	507.82	3037.47	507.82	3108.41	507.66	3178.39	507.1	3182.89	506.82
3189.56	506.6	3194.57	506.49	3205.23	505.82	3213.35	505.99	3217.43	505.87
3267.54	506.9	3281.66	506.94	3283.88	507.15	3322.5	507.47	3343.28	507.56
3403.67	505.77	3467.9	505.82	3496.66	506.25	3517.75	509.7	3531.17	506.04
3559.86	506.06	3571.44	506.08	3587.73	511.07	3598.28	506.29	3607.86	506.15
3654.84	506.23	3672.7	506.31	3715.23	506.58	3724.91	506.77	3794.8	508
3802.36	508.06	3849.44	508.51	3859.23	510.23	3882.23	514.4	3888.54	515.69
3893.43	516.73	3904.89	518.91	3905.05	518.94	3912.7	519.15	3917.98	519.3
3919.43	519.38	3922.3	519.47	3924.85	519.54	3925.18	519.54	3926.62	519.49
3935.72	518.99	3938.8	518.57	3942.85	517.89	3950.44	516.99	3955.85	516.48
3978.49	518.63	4003.79	520.54	4064.18	521.61	4076.38	522.28	4133.2	525.26
4158.55	525.62	4191.68	526.03	4204.48	526.21	4216.56	526.34	4233.86	526.66
4300.01	528.62	4315.66	529.18	4348.9	530.42	4386.29	530.71	4402.67	531.24
4448.6	532.58	4518.69	535.42	4520.5	535.49	4546.38	541.71	4559.8	542.54
4593.62	542.82	4597.19	542.91	4604.86	542.86	4608.12	542.85	4652.83	541.69
4667.33	541.13	4669.09	541.23	4674.59	542.2	4710.31	545.78	4730.18	551.7
4749.62	557.66	4803.3	561.14	4830.14	562.25	4841.36	562.44	4845.48	562.51
4886.7	563.33	4932.72	564.06	4951.33	563.87	4988.8	564.05	4995.99	563.93
5040.09	565.38	5044.39	566.58	5062.51	571.45	5074.6	575		

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .08 1518.6 .04 2556.22 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1518.6 2556.22 406 410 329.99 .1 .3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 130400

INPUT									
Description: FEMA CQ									
Station Elevation Data num= 94									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	101	555.6	198	541.2	289	532.5	371	525.5
385	527	419	527	441	524.6	534	518	614	514.3
697	509.8	775	506.1	807	504	849	508.3	940	510.8

Existing.rep									
1007	516.4	1019	513.5	1037	516.4	1046	516.4	1055	516.4
1090	502.3	1172	499.3	1209	491.1	1288	502.3	1355	506.2
1418	499.9	1443	488	1455.35	486.2	1665.35	484.2	1785.35	482.2
1860.35	482.2	1980.35	484.2	2080.35	484.2	2410.35	484.2	2440.35	486.2
2443	487.2	2483	500.9	2552	504.9	2642	506.2	2693	508.5
2706	508.5	2753	508	2817	508.4	2897	508.1	2985	508.1
3059	507.9	3132	507.2	3160	505.1	3225	506.7	3304	507
3367	504.7	3434	504.7	3464	505.2	3486	509.5	3500	504.9
3542	504.9	3559	511.1	3570	505.1	3580	504.9	3629	504.9
3692	505.1	3775	506.6	3832	507	3890	519	3905	519.5
3908	519.5	3911	519.5	3922	519	3943	516	3993	520.1
4056	520.9	4128	525	4189	525.7	4233	526.3	4302	528.2
4353	530	4392	530	4457	531.9	4532	535.1	4559	542.6
4573	543.5	4612	543.5	4620	543.2	4687	541.1	4730	545.8
4771	560	4827	563.2	4855	564	4871	564	4914	564.2
4962	564.2	5028	562.1	5074	563.4	5110	575		

Manning's n Values
 Sta n Val Sta num= 3
 0 .08 1418 .04 2483 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1418 2483 2400 1704.99 1200 .1 .3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 128690

INPUT									
Description:									
Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	60	571.1	110	568.2	196	554.9	217	555.6
234	553.2	272	550.7	284	550.7	355	549.1	435	547.2
499	543.6	563	542.1	577	542.1	629	540.2	724	538.8
750	536.1	769	536.1	793	536.2	823	517	831	517
852	516.1	923	487.1	933.06	486.2	983.06	484.2	1093.06	482.2
1143.06	480.2	1243.06	478.2	1318.06	476.2	1368.06	476.2	1443.06	478.2
1483.06	480.2	1553.06	482.2	1628.06	484.2	1668.06	486.2	1670	487.1
1713	501.4	1787	506	1841	505.8	1857	505.8	1913	505.1
1935	505.1	1994	506.3	2062	508.1	2090	508.1	2160	507.2
2253	506.6	2348	505.9	2414	503	2422	500.8	2461	500.8
2487	503.8	2547	504.8	2568	504.8	2594	501.2	2676	499.9
2709	501.1	2732	507	2790	506.3	2839	510.7	2866	510.7
2879	509.9	2892	504.8	2926	504.8	2943	511.1	2973	517.2
2993	517.2	3002	519.9	3014	520.5	3023	520.5	3033	520
3063	527.2	3141	535	3232	542.1	3303	547.3	3402	550.8
3481	553.2	3558	557.1	3603	559.8	3703	565.8	3784	566.7
3825	566	3852	566.3	3882	567.3	3940	567	4007	566.3
4047	565.8	4076	565.5	4115	564.3	4124	563.8	4166	565.2
4273	558.1	4382	550.4	4477	575				

Manning's n Values
 Sta n Val Sta num= 3
 0 .1 852 .04 1713 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 852 1713 970 890 900 .1 .3

CROSS SECTION

Existing.rep

RIVER: Susquehanna
 REACH: 1

RS: 127800

INPUT

Description: FEMA CP

Station Elevation Data		num=		66					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	562	104	559	200	554.9	304	553.7	402	549.9
505	546.8	605	544.6	703	543	753	541.2	773	541.2
838	539.2	877	517.5	892	518	897	518	906	516.1
929	507.4	985	504.9	1020	501	1074	499.9	1098	487
1100	486.2	1150	484.2	1275	482.2	1315	480.2	1425	478.2
1500	476.2	1550	476.2	1630	478.2	1670	480.2	1730	482.2
1805	484.2	1835	486.2	1929	487	1957	501.4	2008	503.2
2080	505.1	2105	505.1	2116	505.1	2167	504.4	2188	504.8
2242	506.2	2272	504.9	2297	495.2	2339	492.3	2391	495.2
2439	503.6	2510	506	2582	505	2601	504.2	2629	510.5
2642	510.5	2654	504.7	2687	504.7	2710	510.9	2760	512.1
2787	520	2803	520.7	2808	520.7	2819	520.1	2843	530.1
2894	542.4	2958	554.8	3032	560.7	3131	566.9	3221	570.2
3274	575								

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	1074	.04	1957	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1074	1957		1015	945	960		.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit
W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude #
(ft)	(ft)	(ft/ft)	(ft/s)	(cfs)	(ft)	(ft)
				(sq ft)		
1	139600	10 yr	167000.00	481.50	511.63	
1	512.22	0.000355	6.20	28687.18	2041.02	0.21
1	139600	50 yr	232000.00	481.50	516.13	
1	516.87	0.000386	7.09	38262.09	2255.52	0.22
1	139600	100 yr	260000.00	481.50	517.79	
1	518.60	0.000398	7.43	42192.71	2459.46	0.23
1	139600	500 yr	340000.00	481.50	522.06	
1	522.99	0.000413	8.16	53331.33	2712.75	0.24
1	137275	10 yr	167000.00	476.20	510.20	
1	511.02	0.000514	7.37	25811.93	2417.80	0.25
1	137275	50 yr	232000.00	476.20	514.75	
1	515.65	0.000489	8.01	39995.78	3379.88	0.25
1	137275	100 yr	260000.00	476.20	516.49	
1	517.38	0.000470	8.14	45914.56	3453.23	0.25
1	137275	500 yr	340000.00	476.20	520.94	
1	521.82	0.000425	8.44	61733.54	3634.26	0.24
1	134600	10 yr	167000.00	480.20	508.68	
493.47	509.45	0.000518	7.12	25516.86	1936.11	0.25
1	134600	50 yr	232000.00	480.20	513.23	
496.07	514.17	0.000528	7.99	34337.93	3588.54	0.26

				Existing.rep			
1	134600	100 yr	260000.00	480.20	514.98		
497.11	515.95	0.000524	8.25 38981.17	3830.95		0.26	
1	134600	500 yr	340000.00	480.20	519.52		
499.87	520.58	0.000503	8.81 51514.63	4129.96		0.26	
1	133431	10 yr	167000.00	472.50	508.11		
488.34	508.91	0.000429	7.25 26294.47	1781.35		0.23	
1	133431	50 yr	232000.00	472.50	512.53		
491.41	513.58	0.000491	8.45 34198.19	2232.55		0.25	
1	133431	100 yr	260000.00	472.50	514.21		
492.61	515.35	0.000512	8.90 37217.72	2331.86		0.26	
1	133431	500 yr	340000.00	472.50	518.55		
495.82	519.94	0.000562	10.01 45198.92	2737.63		0.28	
1	133138	10 yr	167000.00	474.40	508.05		
489.76	508.76	0.000435	6.81 26970.08	2392.96		0.23	
1	133138	50 yr	232000.00	474.40	512.48		
492.51	513.40	0.000470	7.85 34942.32	2761.19		0.25	
1	133138	100 yr	260000.00	474.40	514.16		
493.62	515.16	0.000482	8.24 37986.67	2871.94		0.25	
1	133138	500 yr	340000.00	474.40	518.51		
496.58	519.73	0.000512	9.23 46028.69	3276.41		0.27	
1	132450	10 yr	167000.00	470.20	507.81		
489.53	508.46	0.000384	6.52 28467.38	2043.27		0.22	
1	132450	50 yr	232000.00	470.20	512.22		
492.19	513.07	0.000421	7.54 36723.05	2806.81		0.24	
1	132450	100 yr	260000.00	470.20	513.90		
493.25	514.82	0.000434	7.93 40041.43	3026.76		0.24	
1	132450	500 yr	340000.00	470.20	518.34		
496.05	519.34	0.000428	8.56 56130.57	3276.41		0.25	
1	130400	10 yr	167000.00	482.20	506.78		
507.51	0.000566	6.93	26871.45	2206.41	0.26		
1	130400	50 yr	232000.00	482.20	511.26		
512.10	0.000536	7.63	39338.38	3060.18	0.26		
1	130400	100 yr	260000.00	482.20	512.97		
513.84	0.000520	7.84	44648.72	3124.96	0.26		
1	130400	500 yr	340000.00	482.20	517.46		
518.40	0.000487	8.37	59174.95	3365.02	0.26		
1	128690	10 yr	167000.00	476.20	505.13		
506.29	0.000851	8.69	20191.82	1314.88	0.32		
1	128690	50 yr	232000.00	476.20	509.44		
510.89	0.000882	9.84	27827.54	2015.02	0.33		
1	128690	100 yr	260000.00	476.20	511.14		
512.66	0.000875	10.17	31290.12	2079.02	0.34		
1	128690	500 yr	340000.00	476.20	515.65		
517.29	0.000831	10.84	40741.19	2112.24	0.33		
1	127800	10 yr	167000.00	476.20	504.50		
492.07	505.53	0.000780	8.22 21646.01	1282.26		0.31	
1	127800	50 yr	232000.00	476.20	508.80		
494.79	510.10	0.000799	9.35 28737.90	1752.84		0.32	
1	127800	100 yr	260000.00	476.20	510.50		
495.92	511.87	0.000790	9.69 31736.34	1774.71		0.32	
1	127800	500 yr	340000.00	476.20	515.00		

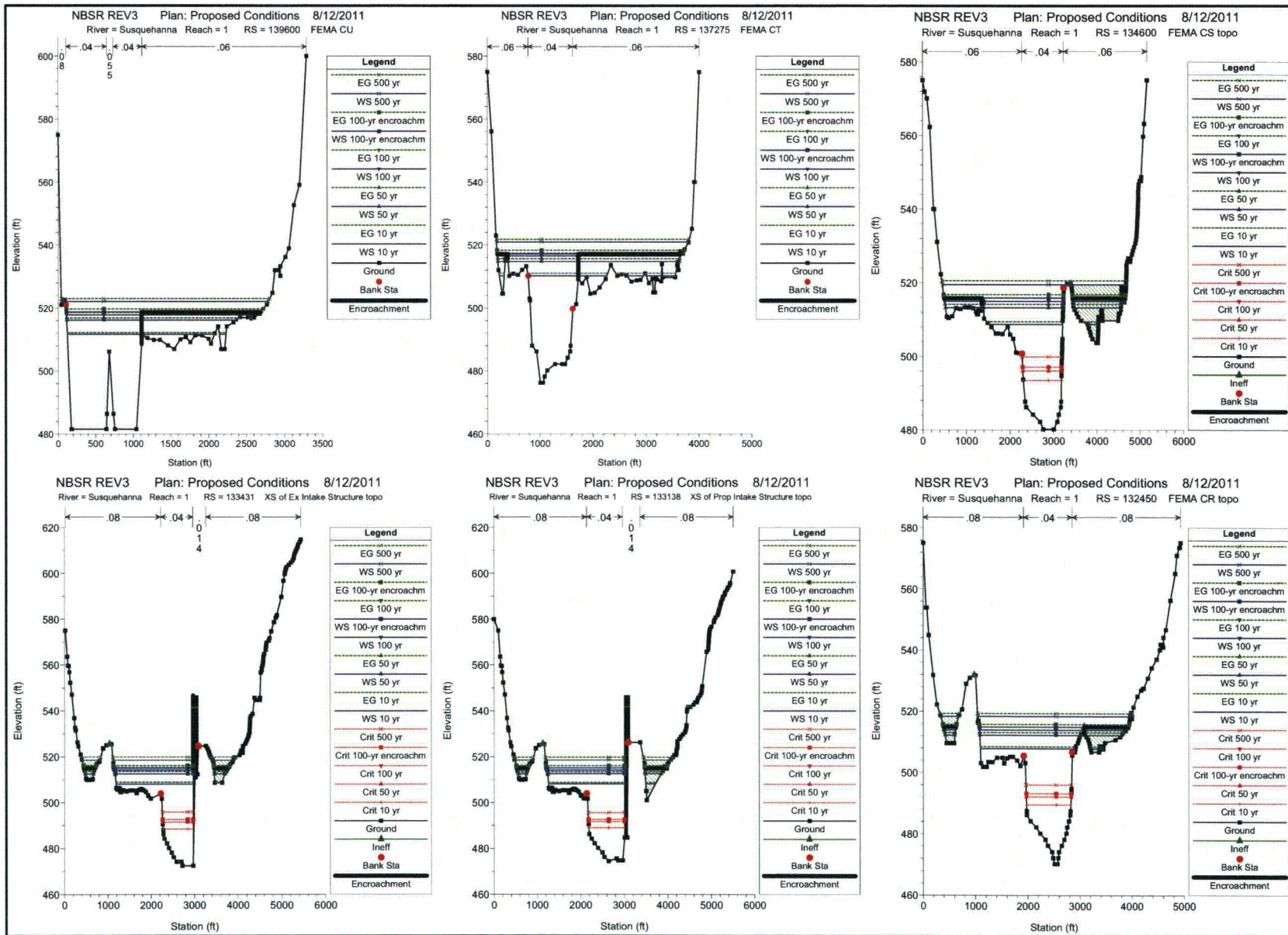
498.70	516.55	0.000762	Existing.rep 10.49	40003.56	1861.00	0.32
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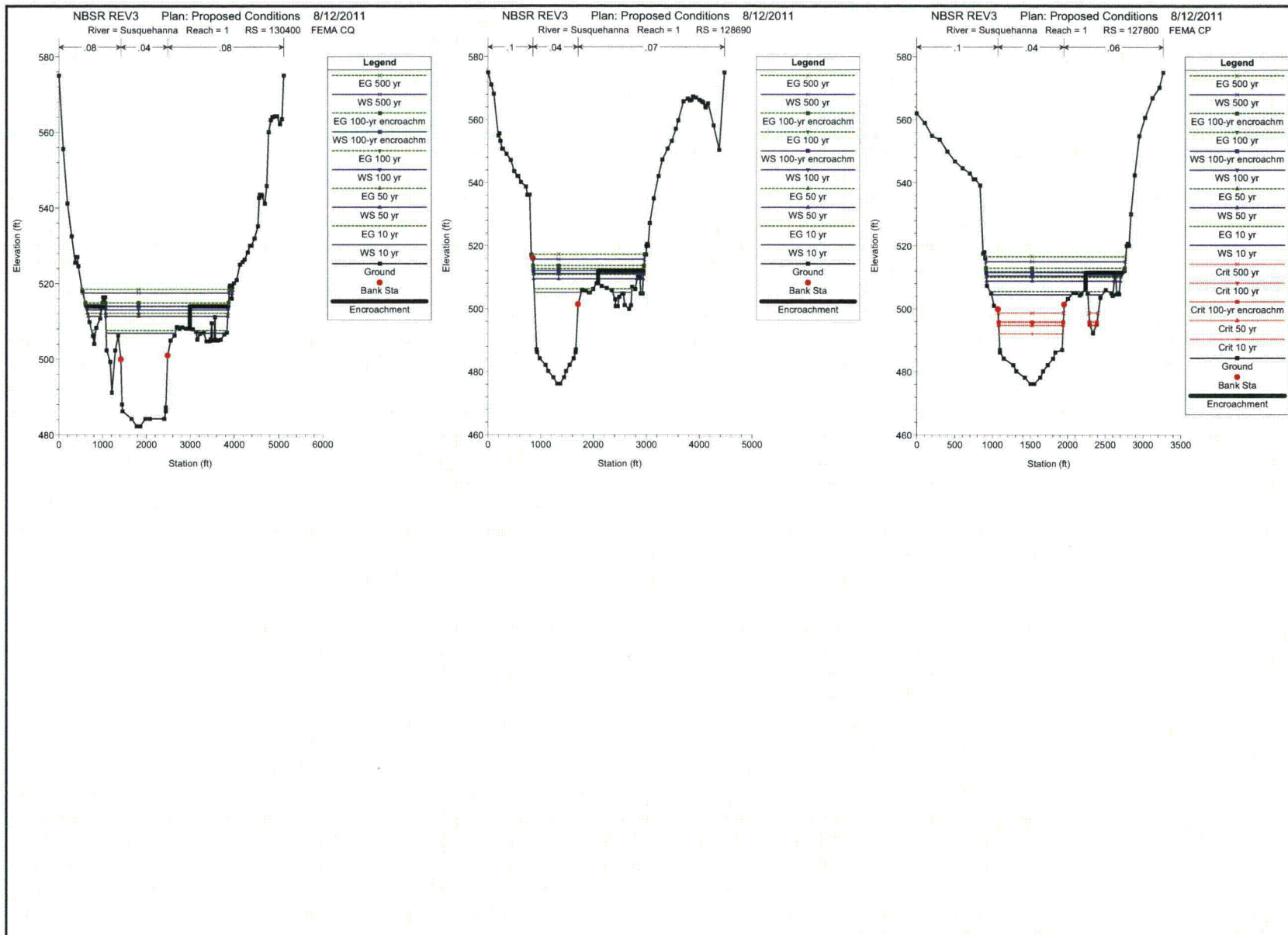
Appendix I: Proposed Conditions Model

- HEC-RAS Reports
- HEC-RAS Cross-Sections
- HEC-RAS Profiles

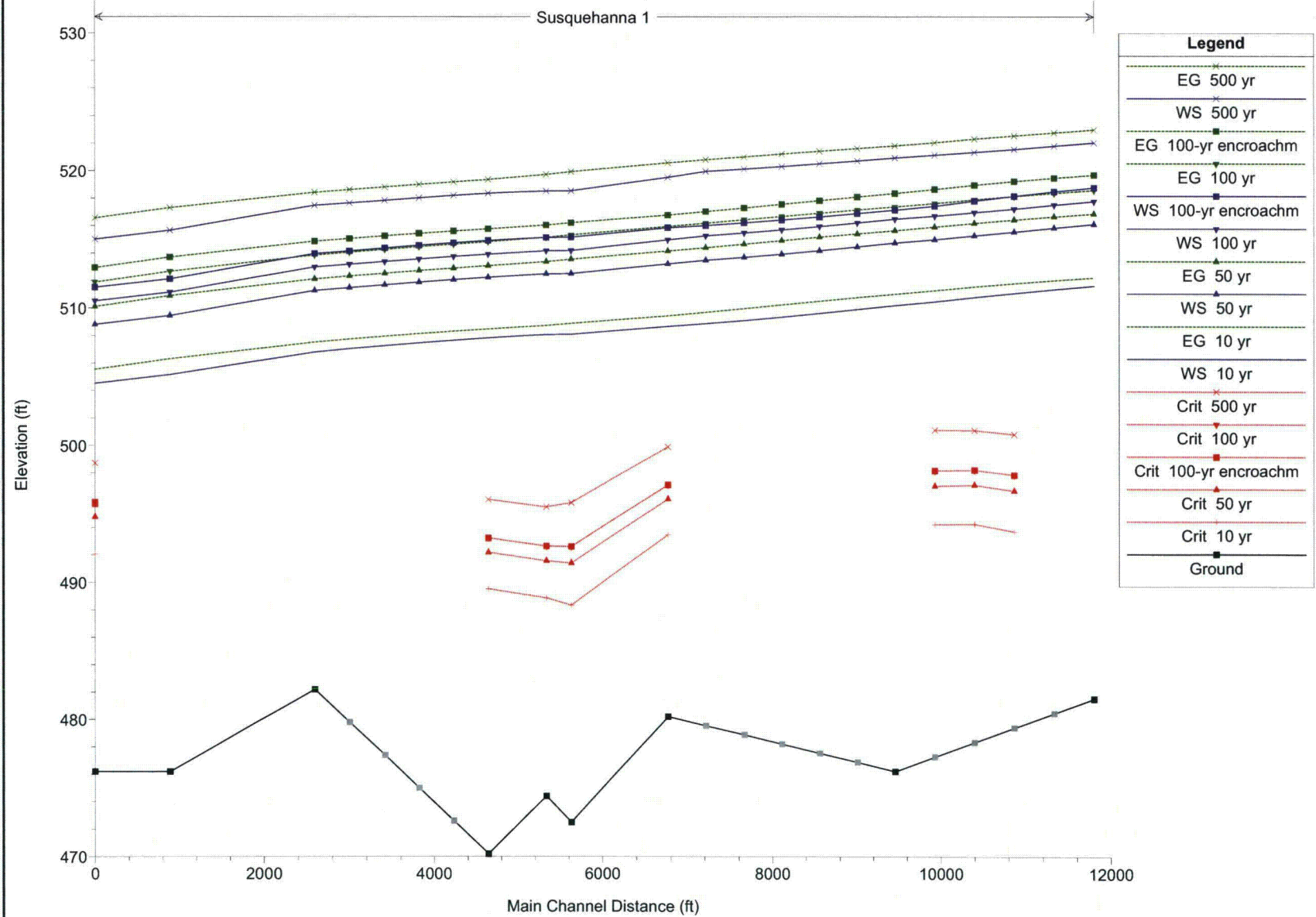
HEC-RAS Plan: Proposed River: Susquehanna Reach: 1

Reach	River Sta.	Profile	Q Total	Min Ch El	W.S. Elev	Crit.W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	139600	10 yr	167000.00	481.50	511.59		512.18	0.000357	6.21	28595.08	2039.81	0.21
1	139600	50 yr	232000.00	481.50	516.09		516.83	0.000388	7.10	38166.47	2253.16	0.22
1	139600	100 yr	260000.00	481.50	517.75		518.56	0.000400	7.44	42088.54	2459.19	0.23
1	139600	500 yr	340000.00	481.50	522.02		522.96	0.000415	8.17	53226.06	2710.93	0.24
1	139600	100-yr encroachm	260000.00	481.50	518.75		519.67	0.000416	7.70	33757.00	1001.01	0.23
1	137275	10 yr	167000.00	476.20	510.16		510.99	0.000516	7.38	25723.65	2411.66	0.25
1	137275	50 yr	232000.00	476.20	514.72		515.62	0.000492	8.02	39884.19	3379.22	0.26
1	137275	100 yr	260000.00	476.20	516.45		517.35	0.000472	8.16	45805.39	3452.90	0.25
1	137275	500 yr	340000.00	476.20	520.92		521.80	0.000427	8.45	61633.96	3633.72	0.25
1	137275	100-yr encroachm	260000.00	476.20	517.11		518.33	0.000559	8.99	31618.68	1338.00	0.28
1	134600	10 yr	167000.00	480.20	508.63	493.47	509.41	0.000522	7.14	25439.10	1930.98	0.25
1	134600	50 yr	232000.00	480.20	513.19	496.07	514.13	0.000531	8.01	34235.08	3555.06	0.26
1	134600	100 yr	260000.00	480.20	514.94	497.11	515.92	0.000526	8.26	38874.81	3825.52	0.26
1	134600	500 yr	340000.00	480.20	519.49	499.87	520.55	0.000505	8.83	51419.86	4125.90	0.26
1	134600	100-yr encroachm	260000.00	480.20	515.82	497.11	516.75	0.000482	8.04	38434.72	1877.57	0.25
1	133431	10 yr	167000.00	472.50	508.06	488.34	508.87	0.000432	7.27	26206.30	1781.16	0.23
1	133431	50 yr	232000.00	472.50	512.48	491.41	513.54	0.000493	8.47	34118.30	2230.68	0.25
1	133431	100 yr	260000.00	472.50	514.16	492.61	515.31	0.000514	8.91	37140.81	2328.77	0.26
1	133431	500 yr	340000.00	472.50	518.51	495.82	519.91	0.000564	10.02	45132.70	2734.98	0.28
1	133431	100-yr encroachm	260000.00	472.50	515.13	492.61	516.20	0.000465	8.62	38901.96	1837.28	0.25
1	133138	10 yr	167000.00	474.40	508.05	488.87	508.71	0.000341	6.58	27883.77	1963.77	0.22
1	133138	50 yr	232000.00	474.40	512.47	491.57	513.38	0.000387	7.70	35623.61	2312.08	0.23
1	133138	100 yr	260000.00	474.40	514.15	492.64	515.12	0.000404	8.12	38577.80	2401.51	0.24
1	133138	500 yr	340000.00	474.40	518.49	495.51	519.71	0.000443	9.19	46387.25	2828.26	0.26
1	133138	100-yr encroachm	260000.00	474.40	515.12	492.65	516.03	0.000365	7.86	40302.54	1797.59	0.23
1	132450	10 yr	167000.00	470.20	507.81	489.53	508.46	0.000384	6.52	28467.38	2043.27	0.22
1	132450	50 yr	232000.00	470.20	512.22	492.19	513.07	0.000421	7.54	36723.05	2806.81	0.24
1	132450	100 yr	260000.00	470.20	513.90	493.25	514.82	0.000434	7.93	40041.43	3026.76	0.24
1	132450	500 yr	340000.00	470.20	518.34	496.05	519.34	0.000428	8.56	56130.57	3276.41	0.25
1	132450	100-yr encroachm	260000.00	470.20	514.90	493.24	515.75	0.000386	7.63	42052.75	2003.73	0.23
1	130400	10 yr	167000.00	482.20	506.78		507.51	0.000566	6.93	26871.45	2206.41	0.26
1	130400	50 yr	232000.00	482.20	511.26		512.10	0.000536	7.63	39338.38	3060.18	0.26
1	130400	100 yr	260000.00	482.20	512.97		513.84	0.000520	7.84	44648.72	3124.96	0.26
1	130400	500 yr	340000.00	482.20	517.46		518.40	0.000487	8.37	59174.95	3365.02	0.26
1	130400	100-yr encroachm	260000.00	482.20	513.95		514.85	0.000497	7.84	39327.08	1923.92	0.26
1	128690	10 yr	167000.00	476.20	505.13		506.29	0.000851	8.69	20191.82	1314.88	0.32
1	128690	50 yr	232000.00	476.20	509.44		510.89	0.000882	9.84	27827.54	2015.02	0.33
1	128690	100 yr	260000.00	476.20	511.14		512.66	0.000875	10.17	31290.12	2079.02	0.34
1	128690	500 yr	340000.00	476.20	515.65		517.29	0.000831	10.84	40741.19	2112.24	0.33
1	128690	100-yr encroachm	260000.00	476.20	512.10		513.69	0.000847	10.22	27356.50	1228.21	0.33
1	127800	10 yr	167000.00	476.20	504.50	492.07	505.53	0.000780	8.22	21646.01	1282.26	0.31
1	127800	50 yr	232000.00	476.20	508.80	494.79	510.10	0.000799	9.35	28737.90	1752.84	0.32
1	127800	100 yr	260000.00	476.20	510.50	495.92	511.87	0.000790	9.69	31736.34	1774.71	0.32
1	127800	500 yr	340000.00	476.20	515.00	498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32
1	127800	100-yr encroachm	260000.00	476.20	511.50	495.74	512.93	0.000760	9.72	29288.21	1323.84	0.32





NBSR REV3 Plan: Proposed Conditions 8/12/2011



proposed.rep

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X      X  XXXXXX   XXXX      XXXX      XX      XXXX
X      X  X        X      X      X      X      X
X      X  X        X      X      X      X      X
XXXXXXXX XXXX      XXX XXXX XXXXXX XXXX
X      X  X        X      X      X      X      X
X      X  X        X      X      X      X      X
X      X  XXXXXX   XXXX      X      X      X      XXXXX

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PROJECT DATA

Project Title: NBSR REV3
Project File : NBSRREV3.prj
Run Date and Time: 8/12/2011 10:16:15 AM

Project in English units

PLAN DATA

Plan Title: Proposed Conditions
Plan File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.p11

Geometry Title: Proposed Conditions
Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g11

Flow Title : FEMA Ex Flow
Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Plan Summary Information:

Number of: Cross Sections	= 22	Multiple Openings	= 0
Culverts	= 0	Inline Structures	= 0
Bridges	= 0	Lateral Structures	= 0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data

Equal Conveyance	= False
Left Offset	= 0
Right Offset	= 0

River = Susquehanna Reach = 1

RS	Profile	Method	proposed.value1	rep.value2
139600	50 yr	0	0	0
139135.*50	yr	0	0	0
138670.*50	yr	0	0	0
138205.*50	yr	0	0	0
137740.*50	yr	0	0	0
137275	50 yr	0	0	0
136829.*50	yr	0	0	0
136383.*50	yr	0	0	0
135937.*50	yr	0	0	0
135491.*50	yr	0	0	0
135045.*50	yr	0	0	0
134600	50 yr	0	0	0
133431	50 yr	0	0	0
133138	50 yr	0	0	0
132450	50 yr	0	0	0
132040.*50	yr	0	0	0
131630.*50	yr	0	0	0
131220.*50	yr	0	0	0
130810.*50	yr	0	0	0
130400	50 yr	0	0	0
128690	50 yr	0	0	0
127800	50 yr	0	0	0

River = Susquehanna		Reach = 1		
RS	Profile	Method	value1	value2
139600	100 yr	0	0	0
139135.*100	yr	0	0	0
138670.*100	yr	0	0	0
138205.*100	yr	0	0	0
137740.*100	yr	0	0	0
137275	100 yr	0	0	0
136829.*100	yr	0	0	0
136383.*100	yr	0	0	0
135937.*100	yr	0	0	0
135491.*100	yr	0	0	0
135045.*100	yr	0	0	0
134600	100 yr	0	0	0
133431	100 yr	0	0	0
133138	100 yr	0	0	0
132450	100 yr	0	0	0
132040.*100	yr	0	0	0
131630.*100	yr	0	0	0
131220.*100	yr	0	0	0
130810.*100	yr	0	0	0
130400	100 yr	0	0	0
128690	100 yr	0	0	0
127800	100 yr	0	0	0

River = Susquehanna		Reach = 1		
RS	Profile	Method	value1	value2
139600	500 yr	0	0	0
139135.*500	yr	0	0	0
138670.*500	yr	0	0	0
138205.*500	yr	0	0	0
137740.*500	yr	0	0	0
137275	500 yr	0	0	0
136829.*500	yr	0	0	0
136383.*500	yr	0	0	0
135937.*500	yr	0	0	0
135491.*500	yr	0	0	0
135045.*500	yr	0	0	0
134600	500 yr	0	0	0

			proposed.rep
133431	500 yr	0	0
133138	500 yr	0	0
132450	500 yr	0	0
132040.*	500 yr	0	0
131630.*	500 yr	0	0
131220.*	500 yr	0	0
130810.*	500 yr	0	0
130400	500 yr	0	0
128690	500 yr	0	0
127800	500 yr	0	0

River = Susquehanna	Reach = 1			
RS	Profile	Method	Value1	Value2
139600	100-yr	encroachment	1	89 1111
139135.*	100-yr	encroachment	1	210 1314.31
138670.*	100-yr	encroachment	1	319.47 1416.98
138205.*	100-yr	encroachment	1	490 1519.66
137740.*	100-yr	encroachment	1	612 1622.33
137275	100-yr	encroachment	1	387 1725
136829.*	100-yr	encroachment	1	515 1990.46
136383.*	100-yr	encroachment	1	635 2255.91
135937.*	100-yr	encroachment	1	770 2521.37
135491.*	100-yr	encroachment	1	885 2790
135045.*	100-yr	encroachment	1	1210 3050
134600	100-yr	encroachment	1	1350 3310
133431	100-yr	encroachment	1	1075 2965.8
133138	100-yr	encroachment	1	1165 3011
132450	100-yr	encroachment	1	1065 3078.44
132040.*	100-yr	encroachment	1	950.47 3017.17
131630.*	100-yr	encroachment	1	925 2955.9
131220.*	100-yr	encroachment	1	875 2935.83
130810.*	100-yr	encroachment	1	1125 2889.79
130400	100-yr	encroachment	1	1060 2985
128690	100-yr	encroachment	1	860 2090
127800	100-yr	encroachment	1	892 2242

FLOW DATA

Flow Title: FEMA Ex Flow

Flow File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.f01

Flow Data (cfs)

River	Reach	RS	10 yr	50 yr
100 yr	500 yr	100-yr encroachment		
Susquehanna	1	139600	167000	232000
260000	340000	260000		

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Susquehanna	1	10 yr	Critical
Known WS = 504.5			

Susquehanna	1	proposed.rep	
Known WS = 508.8		50 yr	Critical
Susquehanna	1	100 yr	Critical
Known WS = 510.5			
Susquehanna	1	500 yr	Critical
Known WS = 515			
Susquehanna	1	100-yr encroachment	Critical
Known WS = 511.5			

GEOMETRY DATA

Geometry Title: Proposed Conditions

Geometry File : C:\Users\ben1\Desktop\FEMA REV DATA\HECRAS\NBSRREV3.g11

CROSS SECTION

RIVER: Susquehanna

REACH: 1

RS: 139600

INPUT

Description: FEMA CU

Station Elevation Data				num=	53				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	42	521	60	522.1	72	522.1	83	522.7
89	522.7	106	521	176	481.5	180	481.5	640	481.5
647	486.36	678	506.2	733	486.36	754	481.5	1040	481.5
1118	511.2	1190	510.5	1274	509.9	1357	509.9	1464	508.2
1545	507	1627	510.1	1697	510.8	1758	509.2	1824	511.3
1914	511.3	1999	510.2	2029	508.7	2081	512	2127	514.2
2166	507	2212	507	2239	514.2	2331	515.4	2417	517
2519	517	2566	516.7	2575	518.6	2584	518.6	2604	517
2676	518.2	2771	521.1	2844	524.8	2876	532	2889	532
2926	532	2945	530.2	2947	533.3	3011	536.2	3058	539
3123	552.7	3196	559.1	3289	600				

Manning's n values				num=	5				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.08	106	.04	647	.055	733	.04	1118	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	106	1118		475	468	413	.1
							.3

Blocked Obstructions			num=	1
Sta L	Sta R	Elev		
2575	3289	518.6		

CROSS SECTION

RIVER: Susquehanna

REACH: 1

RS: 139135.*

INPUT

Description:

Station Elevation Data				num=	117				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	23.49	560.56	49.46	542.15	64.3	533.21	85.94	521.89
90.58	519.79	95.17	518.38	105.42	520.12	108.82	520.19	113.14	520.37
119.64	520.51	128.6	519.56	135.96	519.76	153.02	519.86	163.15	519.83

proposed.rep									
179.3	520.09	188.08	520.37	201.68	520.54	204.96	520.46	228.45	519.87
240.2	518.84	251.25	513.99	255.67	512.5	271.59	504.7	309.32	492.68
342.47	480.44	345.72	480.44	719.04	480.44	724.72	484.33	749.88	500.2
794.52	484.33	811.56	480.44	1043.67	480.44	1052.99	482.1	1068.53	484.61
1113.58	491.12	1157.08	497.03	1172.62	499.13	1189.71	501.85	1203.69	504.15
1205.44	504.75	1218.8	508.9	1275.37	508.77	1292.24	509.33	1314.31	510.12
1377.92	509.49	1381.08	509.48	1459.9	509.88	1462.58	509.84	1523.88	508.06
1571.72	507.5	1602.7	507.16	1654.34	506.77	1687.09	507.87	1737.98	509.64
1790.95	510.34	1809.37	510.66	1871.59	509.98	1883.68	510.4	1938.91	511.44
1995.88	511.08	2030.71	511.13	2067.28	510.81	2117.41	510.26	2148.01	509.03
2158.16	509.53	2201.05	511.47	2243.47	512.87	2247.97	513.04	2287.75	507.32
2333.42	507.36	2334.67	507.36	2362.21	513.13	2405.75	513.59	2456.05	514.36
2486.42	514.96	2543.77	515.24	2550.41	515.18	2611.61	515.46	2627.37	514.58
2647.81	514.58	2653.34	514.55	2665.39	515.41	2691.36	515.18	2695.75	515.15
2704.93	516.66	2714.11	516.65	2734.51	515.34	2758.12	515.61	2772.96	516.88
2787.8	516.24	2807.95	516.5	2904.84	518.82	2979.3	521.78	3008.5	526.93
3011.94	527.62	3025.2	527.91	3042.81	528.3	3050.22	528.5	3053.01	528.3
3062.94	528.07	3065.99	527.77	3082.32	527.13	3084.36	529.68	3100.3	530.81
3104.93	530.95	3145.74	532.26	3149.64	532.44	3174.48	533.86	3197.58	535.09
3239.39	542.27	3263.88	546.66	3300.6	549.7	3338.34	555.06	3341.4	556.33
3353.45	560.49	3433.2	595						

Manning's n Values		num= 6									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.076	240.2	.04	763.34	.054	846.51	.042	1218.8	.06		
3433.2	.06										

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	240.2	1218.8		475	468	413		.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 138670.*

INPUT

Description:

Station Elevation Data			num= 117								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	36.62	559.44	77.1	537.36	100.23	527.91	133.96	517.54		
141.18	515.96	148.35	515.76	164.31	518.97	169.61	519.02	176.36	519.25		
186.48	519.36	200.45	517.22	211.92	517.42	238.52	517.62	254.31	517.56		
279.47	517.69	293.16	518.04	314.35	518.38	319.47	518.37	356.09	518.23		
374.4	516.68	388.94	511.24	394.75	509.97	415.69	500.53	465.33	491.06		
508.94	479.38	511.44	479.38	798.08	479.38	802.45	482.3	821.76	494.2		
856.04	482.3	869.12	479.38	1047.34	479.38	1061.83	481.13	1085.99	483.51		
1156.03	488.89	1223.65	493.32	1247.8	494.9	1274.37	497.44	1296.11	499.66		
1298.83	500.56	1319.6	506.6	1377.27	506.88	1394.48	508.17	1416.98	509.89		
1481.84	509.09	1485.06	509.06	1565.42	509.86	1568.16	509.77	1630.66	507.17		
1679.43	506.79	1711.03	506.57	1763.67	506.54	1797.07	507.53	1848.95	509.19		
1902.96	510.05	1921.75	510.52	1985.19	510.77	1997.51	511.23	2053.83	511.57		
2111.91	510.86	2147.43	510.96	2184.71	510.78	2235.82	510.31	2267.02	509.36		
2277.37	509.72	2321.1	510.94	2364.35	511.75	2368.94	511.89	2409.5	507.64		
2456.06	507.72	2457.34	507.72	2485.42	512.06	2529.81	512.41	2581.1	513.32		
2612.07	513.97	2670.54	513.49	2677.31	513.36	2739.71	513.92	2755.78	512.16		
2776.61	512.16	2782.25	512.14	2794.54	513.93	2821.02	513.64	2825.49	513.61		
2834.85	514.72	2844.21	514.69	2865.01	513.67	2889.09	513.83	2904.22	516.14		
2919.35	514.6	2939.89	514.8	3038.69	516.54	3114.61	518.76	3144.37	522.62		
3147.89	523.23	3161.41	523.82	3179.35	524.6	3186.92	525	3189.75	524.6		
3199.89	524.14	3202.99	523.83	3219.65	524.06	3221.73	526.07	3237.97	527.6		
3242.7	527.69	3284.3	528.5	3288.29	528.68	3313.61	530.07	3337.16	531.18		
3379.8	536.9	3404.76	540.63	3442.2	543.55	3480.68	551.01	3483.8	552.25		

proposed.rep

3496.09 555.37 3577.4 590

Manning's n values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.072	374.4	.04	1047.34	.045	1319.6	.06	3577.4	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

374.4	1319.6	475	468	413	.1	.3
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Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	314.35	518.38	F

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 138205.*

INPUT

Description:

Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49.75	558.33	104.73	532.57	136.15	522.61	181.97	513.2
191.79	512.14	201.52	513.14	223.21	517.81	230.41	517.85	239.57	518.13
253.32	518.2	272.3	514.88	287.89	515.09	324.01	515.38	345.46	515.29
379.65	515.3	398.24	515.71	427.03	516.22	433.98	516.28	483.73	516.59
508.6	514.52	526.63	508.49	533.84	507.45	559.79	496.35	621.34	489.44
675.42	478.32	677.15	478.32	877.13	478.32	880.17	480.26	893.65	488.2
917.56	480.26	926.69	478.32	1051.02	478.32	1070.68	480.15	1103.44	482.41
1198.47	486.66	1290.22	489.61	1322.99	490.67	1359.03	493.03	1388.52	495.17
1392.22	496.37	1420.4	504.3	1479.18	504.98	1496.72	507	1519.66	509.66
1585.76	508.68	1589.04	508.64	1670.95	509.84	1673.73	509.71	1737.44	506.28
1787.15	506.09	1819.35	505.98	1873.01	506.3	1907.04	507.19	1959.93	508.73
2014.97	509.77	2034.12	510.38	2098.78	511.55	2111.34	512.05	2168.74	511.71
2227.94	510.64	2264.14	510.79	2302.14	510.75	2354.24	510.37	2386.03	509.69
2396.58	509.91	2441.15	510.41	2485.23	510.64	2489.91	510.73	2531.25	507.96
2578.71	508.08	2580.01	508.08	2608.63	510.98	2653.87	511.24	2706.15	512.29
2737.71	512.98	2797.3	511.73	2804.2	511.54	2867.8	512.38	2884.19	509.74
2905.42	509.74	2911.17	509.73	2923.7	512.46	2950.68	512.09	2955.24	512.06
2964.78	512.78	2974.32	512.74	2995.52	512.01	3020.06	512.05	3035.48	515.39
3050.9	512.97	3071.84	513.1	3172.53	514.26	3249.91	515.74	3280.25	518.32
3283.83	518.85	3297.61	519.73	3315.9	520.9	3323.61	521.5	3326.5	520.9
3336.83	520.21	3339.99	519.89	3356.97	520.99	3359.09	522.45	3375.65	524.4
3380.47	524.43	3422.87	524.73	3426.93	524.92	3452.74	526.28	3476.75	527.27
3520.2	531.54	3545.64	534.59	3583.8	537.4	3623.02	546.97	3626.2	548.17
3638.73	550.25	3721.6	585						

Manning's n values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.068	508.6	.04	1051.02	.052	1103.44	.047	1420.4	.06
3721.6	.06								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

508.6	1420.4	475	468	413	.3	.5
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Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	253.32	518.2	F

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 137740.*

proposed.rep

INPUT

Description:

Station Elevation Data			num=	117							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	62.87	557.21	132.37	527.79	172.08	517.3	229.99	508.85		
242.39	508.32	254.69	510.53	282.1	516.66	291.2	516.67	302.79	517.02		
320.16	517.05	344.15	512.54	363.85	512.75	409.51	513.14	436.62	513.02		
479.82	512.9	503.32	513.38	539.71	514.06	548.49	514.19	611.36	514.94		
642.8	512.36	664.31	505.75	672.92	504.92	703.9	492.18	777.35	487.82		
841.89	477.26	842.87	477.26	956.17	477.26	957.89	478.23	965.53	482.2		
979.08	478.23	984.25	477.26	1054.69	477.26	1079.52	479.18	1120.9	481.3		
1240.92	484.43	1356.79	485.91	1398.17	486.43	1443.7	488.61	1480.94	490.69		
1485.61	492.19	1521.2	502	1581.09	503.09	1598.96	505.83	1622.33	509.43		
1689.67	508.27	1693.02	508.22	1776.47	509.82	1779.31	509.64	1844.22	505.39		
1894.87	505.39	1927.68	505.39	1982.34	506.07	2017.02	506.84	2070.9	508.28		
2126.99	509.48	2146.5	510.24	2212.38	512.33	2225.17	512.88	2283.65	511.84		
2343.97	510.42	2380.85	510.62	2419.57	510.73	2472.65	510.42	2505.05	510.02		
2515.79	510.11	2561.2	509.88	2606.12	509.52	2610.88	509.58	2653	508.28		
2701.35	508.44	2702.68	508.44	2731.84	509.91	2777.94	510.07	2831.2	511.25		
2863.36	511.99	2924.07	509.98	2931.1	509.72	2995.9	510.84	3012.59	507.32		
3034.23	507.32	3040.08	507.31	3052.85	510.98	3080.34	510.55	3084.99	510.51		
3094.71	510.84	3104.43	510.78	3126.03	510.34	3151.03	510.28	3166.74	514.65		
3182.45	511.33	3203.78	511.4	3306.38	511.98	3385.22	512.72	3416.12	514.01		
3419.78	514.47	3433.81	515.64	3452.45	517.2	3460.31	518	3463.25	517.2		
3473.77	516.28	3477	515.94	3494.29	517.93	3496.45	518.83	3513.32	521.2		
3518.23	521.16	3561.43	520.97	3565.57	521.16	3591.87	522.49	3616.33	523.36		
3660.6	526.17	3686.53	528.56	3725.4	531.25	3765.36	542.93	3768.6	544.08		
3781.36	545.12	3865.8	580								

Manning's n Values

Sta	n Val	Sta	num=	6	Sta	n Val	Sta	n Val	Sta	n Val
0	.064	642.8	.04	1120.9	.052	1240.92	.05	1521.2	.06	
3865.8	.06									

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	642.8	1521.2		475	468	413		.1	.3

Ineffective Flow			num=	1
Sta L	Sta R	Elev	Permanent	F
0	320.16	517.05		

CROSS SECTION

RIVER: Susquehanna

REACH: 1

RS: 137275

INPUT

Description: FEMA CT

Station Elevation Data				num= 70							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	76	556.1	160	523	208	512	278	504.5		
293	504.5	341	515.5	352	515.5	366	515.9	387	515.9		
416	510.2	495	510.9	580	510.5	663	512.1	739	513.3		
777	510.2	802	503	812	502.4	848	488	933.36	486.2		
1008.36	476.2	1058.36	476.2	1088.36	478.2	1138.36	480.2	1283.36	482.2		
1423.36	482.2	1473.36	482.2	1528.36	484.2	1573.36	486.2	1579	488		
1622	499.7	1683	501.2	1725	509.2	1797	507.8	1882	509.8		
1951	504.5	2036	504.8	2127	506.5	2239	509.2	2339	513.7		
2460	510.2	2537	510.7	2635	510.3	2727	508.4	2824	508.8		
2902	508.9	2989	511	3058	507.9	3124	509.3	3141	504.9		
3169	504.9	3182	509.5	3210	509	3282	508.5	3298	513.9		
3314	509.7	3552	509.7	3589	513.5	3597	514.5	3600	513.5		

proposed.rep									
4122.59	523.34	4127.6	523.85	4132.39	524.35	4132.94	524.41	4137.07	524.79
4141.09	525.21	4145.23	525.63	4148.61	526.03	4151.44	526.43	4154.26	526.82
4157.06	527.22	4159.85	527.61	4162.75	528	4165.87	528.4	4173.01	528.89
4197.56	529.75	4198.44	529.77	4221.99	530.86	4233.41	531.39	4238.4	531.95
4260.19	534.42	4293.23	544.6	4301.37	546.96	4313.53	547.54	4317.48	548.88
4394	575								

Manning's	n	Values	num=	3	
Sta	n	Val	Sta	n	Val
0	.06	1277.33	.04	2159.54	.06

Bank	Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
		1277.33	2159.54		464.17	448.38	414.17		.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 135937.*

INPUT

Description:

Station Elevation Data			num= 231							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	575	32.86	571.37	68.4	568.22	112.65	561.52	149.41	551.84	
168.31	546.16	178.36	545.15	224.63	536.06	282.3	525.88	314.54	520.55	
330.58	518.57	371.48	513.58	396.96	511.95	405.68	511.44	408.91	511.26	
455.3	510.19	516.32	509.62	546.52	508.75	576.01	508.71	582.03	509.05	
649.76	513.2	670.37	514.4	691.99	514.4	708.09	514.52	719.52	514.58	
760.8	514.52	775.82	513.75	817.81	511.21	823.43	511.16	836.84	510.84	
847.57	510.87	859.64	511.64	897.86	511.48	909.26	512.86	913.28	513.07	
918.65	512.88	935.41	512.77	942.79	510.53	973.12	510.27	998.44	509.97	
1056.78	509.35	1125.84	508.37	1140.22	508.35	1153.34	508.41	1224.41	508.71	
1303.39	510.08	1304.88	510.11	1344.44	509.16	1390.04	508.8	1434.96	507.13	
1452.8	507.16	1475.2	506.64	1527.5	505.45	1544.45	500.38	1566.4	496.45	
1579.07	495.11	1581.95	494.93	1596.43	492.44	1637.96	486.75	1714.32	485.58	
1770.77	484.72	1832.2	481.57	1887.46	478.2	2032.46	478.2	2053.53	479.36	
2088.64	480.63	2162.64	481.93	2190.48	482.6	2232.07	483.2	2288.8	483.93	
2310.19	484.2	2323.1	484.95	2323.92	485.14	2337.85	488.81	2341.32	489.4	
2344.8	489.99	2348.27	490.58	2351.74	491.17	2355.21	491.76	2358.68	492.35	
2362.15	492.94	2362.54	493.01	2365.63	493.55	2369.1	494.16	2372.57	494.77	
2389.93	497.82	2394.09	498.45	2394.15	498.46	2398.11	499.82	2398.33	499.89	
2402.84	501.27	2407.08	502.59	2411.36	503.92	2415.6	505.24	2419.83	506.56	
2424.07	507.88	2428.31	509.2	2483.42	510.24	2521.37	514.45	2522.02	514.44	
2586.43	513.75	2604	513.98	2630.37	513.82	2643.24	513.49	2649.96	513.08	
2657.13	512.67	2663.23	512.39	2665.61	512.15	2679.51	511.06	2708.75	509.32	
2725.58	508.44	2761.34	508.17	2802.38	507.77	2803.88	507.77	2871.9	507.97	
2884.6	508.06	2985.8	509.12	3046.01	510.45	3076.16	510.71	3076.66	510.69	
3104.95	509.74	3127.35	508.88	3166.84	507.75	3185.49	507.36	3255.06	507.29	
3273.13	507.16	3304.35	507.09	3312.61	507.57	3315.84	508.06	3319.06	508.56	
3321.28	509.05	3324.3	509.54	3327.12	510.04	3329.74	510.53	3343.61	510.5	
3344.84	510.49	3346.57	509.97	3393.74	509.43	3396.06	509.9	3397.84	510.38	
3399.7	510.86	3414.53	510.69	3418.65	510.14	3422.91	509.59	3426.74	509.05	
3426.76	509.05	3514.38	509.25	3584.86	509.3	3663.47	510.35	3725.81	508.8	
3785.45	509.5	3800.81	507.3	3826.11	507.3	3837.85	509.6	3844.67	510.03	
3851.71	510.46	3863.15	510.35	3868.22	510.33	3881.2	510.28	3908.93	510.67	
3911.83	511.16	3914.73	511.65	3917.71	512.14	3920.53	512.63	3923.27	513.12	
3925.77	513.61	3928.21	513.6	3936.64	515.17	3942.67	516.16	3957.12	513.73	
3958.54	513.7	3966.73	513.2	3975.26	512.7	3984.26	512.2	3995.8	512.2	
4012.83	512.7	4026.3	513.2	4032.37	513.7	4037.61	514.2	4041.36	514.7	
4044.51	515.2	4047.25	515.7	4049.92	516.2	4052.6	516.7	4055.09	517.2	
4070.03	517.7	4095.63	518.2	4102.28	518.2	4135.06	517.7	4150.07	517.7	
4156.72	518.2	4172.17	518.4	4194.79	519.99	4205.6	520.81	4212.83	521.45	

				proposed.rep					
4215.54	521	4220.8	520.79	4228.19	520.46	4255.26	523.28	4261.62	523.97
4266.14	524	4282.18	524.16	4302.97	524.48	4305.9	524.56	4315.99	525.22
4323.92	525.93	4328.75	526.56	4333.38	527.19	4333.91	527.26	4337.9	527.77
4341.78	528.33	4345.78	528.9	4349.04	529.45	4351.77	530	4354.5	530.54
4357.2	531.09	4359.9	531.63	4362.69	532.18	4365.71	532.73	4372.6	533.34
4396.31	534.24	4397.16	534.25	4419.9	535.07	4430.93	535.47	4435.74	536.14
4456.79	539.09	4488.69	548.38	4496.55	550.44	4508.29	551.31	4512.11	552.46
4586	575								

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.06	1527.5	.04
		2428.31	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1527.5	2428.31	464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 135491.*

INPUT

Description:

Station	Elevation	Data	num=	231					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	38.24	571.55	79.6	568.85	131.1	561.78	173.88	550.41
195.87	544.1	207.58	543.43	261.42	534.41	328.53	524.69	366.06	519.73
384.72	517.71	432.32	512.65	461.97	511.46	472.12	511.13	475.87	511.02
529.87	510.42	600.88	510.78	636.02	510.17	670.34	510.11	677.35	510.33
756.17	513.23	780.16	514.03	805.33	514.03	824.06	514.11	837.36	514.14
885.4	514.06	902.88	513.53	951.75	511.55	958.29	511.48	973.89	511.03
986.38	511.04	1000.43	512.06	1044.91	511.79	1058.17	513.6	1062.85	513.88
1069.1	513.62	1088.61	513.44	1097.19	510.45	1132.49	510.06	1161.96	509.68
1229.85	508.9	1310.23	507.64	1326.96	507.63	1342.22	507.68	1424.94	507.84
1516.85	509.41	1518.59	509.44	1564.63	508.08	1617.69	507.47	1669.98	505.12
1690.73	505.11	1716.8	504.72	1777.67	503.87	1796.63	498.15	1821.19	494.26
1835.38	492.64	1838.61	492.43	1854.81	490.36	1901.29	486.33	1986.73	485.12
2049.91	484.23	2118.65	481.78	2180.49	478.87	2357.16	478.87	2375.25	479.75
2405.41	480.78	2468.95	482.02	2492.85	482.73	2528.57	483.53	2577.28	484.5
2595.64	484.87	2606.73	485.87	2607.43	486.12	2619.4	490.77	2622.38	491.5
2625.36	492.23	2628.35	492.95	2631.33	493.68	2634.31	494.41	2637.29	495.13
2640.27	495.86	2640.6	495.94	2643.25	496.6	2646.23	497.34	2649.21	498.08
2664.12	501.78	2667.69	502.53	2667.74	502.54	2671.14	503.77	2671.33	503.83
2675.21	505.08	2678.84	506.29	2682.53	507.51	2686.16	508.73	2689.8	509.94
2693.44	511.15	2697.07	512.37	2750.23	513.26	2786.83	516.2	2787.45	516.2
2849.57	515.73	2866.52	515.89	2891.95	515.45	2904.36	514.89	2910.85	514.28
2917.76	513.68	2923.64	513.25	2925.94	513	2939.34	511.94	2967.54	510.44
2983.77	509.75	3018.26	509.35	3057.84	508.76	3059.29	508.74	3124.89	508.55
3137.14	508.58	3234.73	509.1	3292.8	509.87	3321.87	509.71	3322.36	509.69
3349.64	508.73	3371.25	507.82	3409.34	506.73	3427.31	506.42	3494.41	506.15
3511.84	506.01	3541.95	505.96	3549.92	506.61	3553.03	507.28	3556.14	507.94
3558.28	508.6	3561.19	509.26	3563.91	509.92	3566.44	510.59	3579.81	510.57
3581	510.56	3582.66	509.88	3628.16	509.52	3630.4	510.17	3632.11	510.82
3633.91	511.47	3648.21	511.36	3652.18	510.66	3656.29	509.96	3659.98	509.27
3660	509.27	3744.51	509.4	3812.48	509.43	3888.29	510.13	3948.42	509.1
4005.93	509.57	4020.74	508.1	4045.14	508.1	4056.47	509.63	4063.05	510.26
4069.84	510.88	4080.87	510.8	4085.75	510.79	4098.28	510.75	4125.02	511.35
4127.82	512.01	4130.61	512.67	4133.49	513.33	4136.21	513.99	4138.85	514.65
4141.26	515.31	4143.61	515.3	4151.74	516.35	4157.56	516.92	4171.5	515.08
4172.86	515.03	4180.76	514.37	4188.99	513.7	4197.67	513.03	4208.8	513.03
4225.22	513.7	4238.21	514.37	4244.06	515.03	4249.12	515.7	4252.73	516.37
4255.78	517.03	4258.41	517.7	4260.99	518.37	4263.57	519.03	4265.98	519.7

proposed.rep									
4280.38	520.37	4305.08	521.03	4311.49	521.03	4343.1	520.37	4357.58	520.37
4363.99	521.03	4378.89	521.3	4400.71	522.56	4411.14	523.24	4418.11	523.76
4420.72	523.5	4425.79	523.43	4432.92	523.28	4459.02	525.42	4465.16	525.96
4469.52	526.04	4484.99	526.34	4505.04	526.88	4507.86	527.02	4517.6	527.71
4525.24	528.52	4529.9	529.27	4534.36	530.02	4534.88	530.11	4538.73	530.74
4542.47	531.45	4546.33	532.16	4549.47	532.87	4552.1	533.56	4554.74	534.26
4557.34	534.96	4559.94	535.65	4562.64	536.35	4565.54	537.05	4572.19	537.79
4595.06	538.72	4595.88	538.73	4617.81	539.28	4628.45	539.55	4633.09	540.33
4653.39	543.75	4684.16	552.15	4691.73	553.92	4703.06	555.09	4706.74	556.04
4778	575								

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.06	1777.67	.04
		2697.07	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff Contr.	Expan.
	1777.67	2697.07		464.17	448.38	414.17	.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 135045.*

INPUT

Description:

Station Elevation Data			num=	231
Sta	Elev	Sta	Elev	Sta
0	575	43.62	571.72	90.8
223.44	542.05	236.79	541.72	298.21
438.86	516.86	493.16	511.73	526.99
604.43	510.66	685.44	511.94	725.53
862.59	513.27	889.95	513.67	918.66
1010	513.6	1029.94	513.32	1085.69
1125.19	511.22	1141.21	512.48	1191.95
1219.55	514.36	1241.8	514.12	1251.6
1402.93	508.45	1494.61	506.92	1513.7
1730.31	508.74	1732.29	508.77	1784.81
1928.66	503.06	1958.4	502.81	2027.83
2091.69	490.17	2095.26	489.94	2113.18
2329.05	483.74	2405.11	481.99	2473.53
2722.17	480.92	2775.25	482.11	2795.22
2881.1	485.53	2890.37	486.78	2890.95
2905.93	494.46	2908.42	495.33	2910.91
2918.38	498.78	2918.66	498.88	2920.88
2938.31	505.74	2941.3	506.62	2941.34
2947.57	508.89	2950.61	510	2953.69
2962.8	514.43	2965.84	515.53	3017.04
3112.71	517.72	3129.03	517.79	3153.53
3178.38	514.69	3184.05	514.12	3186.26
3241.96	511.07	3275.18	510.52	3313.3
3389.67	509.11	3483.67	509.07	3539.59
3594.34	507.71	3615.14	506.76	3651.83
3750.55	504.85	3779.55	504.83	3787.22
3795.27	508.15	3798.08	508.98	3800.7
3817.16	510.63	3818.76	509.79	3862.58
3868.11	512.09	3881.89	512.03	3885.72
3893.25	509.48	3974.64	509.55	4040.1
4226.41	509.63	4240.68	508.9	4264.18
4287.96	511.29	4298.59	511.25	4303.29
4343.8	512.85	4346.5	513.68	4349.26
4356.75	517	4359.02	517	4366.85
4387.19	516.37	4394.8	515.53	4402.72
				514.7

proposed.rep									
4437.62	514.7	4450.13	515.53	4455.76	516.37	4460.63	517.2	4464.11	518.03
4467.04	518.87	4469.58	519.7	4472.07	520.53	4474.55	521.37	4476.87	522.2
4490.74	523.03	4514.52	523.87	4520.7	523.87	4551.15	523.03	4565.09	523.03
4571.27	523.87	4585.62	524.2	4606.63	525.13	4616.67	525.68	4623.38	526.08
4625.9	526	4630.79	526.06	4637.65	526.1	4662.79	527.56	4668.7	527.95
4672.9	528.07	4687.8	528.52	4707.11	529.29	4709.83	529.47	4719.2	530.21
4726.57	531.11	4731.06	531.99	4735.35	532.86	4735.85	532.96	4739.55	533.72
4743.16	534.58	4746.87	535.43	4749.9	536.28	4752.44	537.13	4754.97	537.98
4757.48	538.83	4759.99	539.68	4762.58	540.53	4765.38	541.38	4771.79	542.25
4793.81	543.21	4794.59	543.22	4815.72	543.49	4825.96	543.62	4830.43	544.51
4849.99	548.41	4879.62	555.93	4886.91	557.39	4897.82	558.86	4901.37	559.62
4970	575								

Manning's n Values	num=	3
Sta n Val Sta	n Val Sta n Val	
0 .06 2027.83	.04 2965.84 .06	

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
2027.83 2965.84	464.16 448.3 414.16	.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 134600

INPUT

Description: FEMA CS topo
 Station Elevation Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	49	571.9	102	570.1	168	562.3	251	540
266	540	335	531.1	421	522.3	493	516	554	510.8
592	510.5	605	510.5	679	510.9	770	513.1	868	512.9
969	513.3	1056	513.3	1157	513.1	1228	512.1	1248	511.4
1264	511.4	1282	512.9	1339	512.4	1356	515.1	1362	515.5
1370	515.1	1395	514.8	1406	510.3	1489	509.1	1576	508
1679	506.2	1720	506.2	1826	506.1	1946	508.1	2005	505.9
2073	504.8	2140	501.1	2200	500.9	2278	500.7	2301	493.7
2348	487.7	2371.56	486.2	2531.56	484.2	2691.56	482.2	2766.56	480.2
3006.56	480.2	3081.56	482.2	3121.56	484.2	3166.56	486.2	3174	487.7
3182.5	494.7	3184.5	495.7	3186.5	496.7	3188.5	497.7	3190.5	498.7
3192.5	499.7	3194.5	500.7	3196.5	501.7	3198.5	502.7	3200.5	503.7
3202.5	504.7	3212.5	509.7	3214.9	510.7	3217.34	511.7	3219.94	512.7
3222.38	513.7	3224.85	514.7	3227.29	515.7	3229.73	516.7	3232.17	517.7
3234.61	518.7	3318.32	519.7	3391.55	519.7	3415.11	518.7	3426.6	517.7
3432.61	516.7	3439.01	515.7	3446.59	514.7	3459	513.7	3485.12	512.7
3532.1	511.7	3570.1	510.7	3630.86	509.7	3786.38	508.7	3813.76	507.7
3839.03	506.7	3859.04	505.7	3894.32	504.7	3989.26	503.7	4017.15	503.7
4024.53	504.7	4027.41	505.7	4030.29	506.7	4032.27	507.7	4034.97	508.7
4037.49	509.7	4039.83	510.7	4053.32	510.7	4054.86	509.7	4097	509.7
4099.07	510.7	4100.66	511.7	4102.32	512.7	4115.57	512.7	4119.25	511.7
4123.05	510.7	4126.49	509.7	4493.71	509.7	4499.8	510.7	4506.09	511.7
4520.83	511.7	4532.43	511.7	4557.2	512.7	4559.79	513.7	4562.38	514.7
4565.04	515.7	4567.56	516.7	4570.01	517.7	4572.24	518.7	4581.95	518.7
4601.51	517.7	4608.83	516.7	4616.45	515.7	4624.49	514.7	4634.8	514.7
4650.01	515.7	4662.04	516.7	4667.46	517.7	4672.14	518.7	4675.49	519.7
4678.31	520.7	4680.75	521.7	4683.14	522.7	4685.53	523.7	4687.76	524.7
4701.1	525.7	4723.97	526.7	4729.91	526.7	4759.19	525.7	4772.6	525.7
4778.54	526.7	4812.55	527.7	4835.78	528.7	4866.56	529.7	4890.61	530.7
4909.18	531.7	4920.81	532.7	4927.89	533.7	4932.21	534.7	4936.34	535.7
4940.38	536.7	4943.85	537.7	4947.42	538.7	4950.33	539.7	4952.77	540.7
4955.21	541.7	4957.62	542.7	4960.03	543.7	4962.53	544.7	4965.22	545.7
4971.38	546.7	4992.56	547.7	5013.63	547.7	5023.48	547.7	5027.78	548.7

5075.08	559.7	5096	563.2	proposed.rep	5162	575
Manning's n Values						
Sta	n Val	Sta	n Val	Sta	n Val	
0	.06	2278	.04	3234.61	.06	
Bank Sta: Left Right Lengths: Left Channel Right						
	2278	3234.61		1080.55	1139.54	1175.03
Ineffective Flow num= 1						
Sta L	Sta R	Elev	Permanent		Coeff Contr.	Expan.
3391.55	5162	519.7	F		.1	.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 133431

INPUT

Description: XS of Ex Intake Structure topo
 Station Elevation Data num= 179

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
20	575	63.88	563.59	79.47	559.7	96.46	559.49	111.34	556.9
133.63	552.32	170.45	547.05	221.77	536.83	244.78	532.63	258.21	531.53
299.29	526.16	320	524.5	371.5	520.87	397.01	518.87	449.03	515.07
461.49	513.93	498.94	510.55	516.12	510	550.15	509.9	561.79	509.9
578.58	509.93	628.06	510.03	651.86	510.25	683.72	514.07	709.55	515.34
748.5	516.87	797.31	517.8	809.03	518.05	887.76	523.49	891.86	523.77
965.67	525.01	967.26	525.03	1056.12	525.54	1059.65	525.55	1085.13	525.35
1119.7	517.26	1129.73	514.84	1137.17	515.07	1137.61	515.07	1138.23	515.07
1142.48	515.07	1151.94	514.47	1160.53	514.2	1168.06	512.46	1191.33	506.29
1219.1	505.71	1234.33	506.35	1236.99	506.37	1239.7	506.43	1246.87	506.3
1269.25	506.2	1279.1	504.7	1304.96	504.56	1341.06	505.43	1353.43	505.36
1426.02	504.96	1431.34	504.99	1517.35	505.37	1523.58	505.33	1560.3	505.33
1626.73	505.31	1655.22	504.33	1663.89	504.09	1721.24	505.58	1762.69	506.05
1783.89	505.87	1815.52	505.43	1838.05	505.3	1876.42	504.71	1925.13	503.27
1936.42	502.83	1990.15	501.78	1990.97	501.77	2225.73	503.9	2247.39	501.66
2268.3	490.51	2282.3	488	2285.8	486.2	2310.8	484.2	2370.8	482.2
2415.8	480.2	2475.8	478.2	2525.8	476.2	2590.8	474.2	2700	474.2
2722	472.5	2965.8	472.5	3010.97	510.98	3025.05	511.32	3069.71	512.4
3089.8	524.7	3261.44	524.7	3296.35	523.7	3315.96	522.7	3334.18	521.7
3352.9	520.7	3377.31	519.7	3416.45	518.7	3434.16	517.7	3438.84	516.7
3441.75	515.7	3464.95	508.7	3635.39	508.7	3695.47	512.7	3729.89	513.7
3760.07	514.7	3797.72	515.7	3823.61	516.7	3870.15	517.7	3894.18	518.7
3926.25	519.7	4036.52	520.7	4062.59	521.7	4072.83	522.7	4079.04	522.7
4081.99	521.7	4088.88	521.7	4101.51	521.7	4105.95	521.7	4108.63	522.7
4111.08	523.7	4121.65	524.7	4170.67	525.7	4193.46	526.7	4216	527.7
4237.77	528.7	4254.01	529.7	4266.02	530.7	4270.48	531.7	4272.86	532.7
4274.9	533.7	4276.76	534.7	4278.69	535.7	4280.47	536.7	4297.21	537.7
4337.33	538.7	4381.16	545.7	4439.94	544.7	4471.96	544.7	4480.4	544.7
4503.16	544.7	4504.55	545.7	4525.95	556.7	4546.76	557.7	4550.01	558.7
4566.02	559.7	4573.83	560.7	4581.25	561.7	4584.25	562.7	4587.63	563.7
4605.2	564.7	4636.09	566.7	4643.17	567.7	4652.1	568.7	4659.08	569.7
4709.38	570.7	4728.91	571.7	4767.71	574.7	4826.02	578.7	4866.76	580.7
4889.06	581.7	4990.46	589.7	5039.94	596.7	5065.73	599.7	5079.67	600.7
5091.75	601.7	5109.58	602.7	5159.72	603.7	5208.74	604.7	5248.85	605.7
5272.62	606.7	5283.39	607.7	5295.65	608.7	5321.28	609.7	5344.31	610.7
5365.7	611.7	5380.05	612.7	5410.31	613.7	5434.83	614.7		

Manning's n Values			num=	4
Sta	n Val	Sta	n Val	Sta
20	.08	2225.73	.04	2965.8
				.014
				3261.44
				.08

Bank Sta: Left Right Lengths: Left Channel Right
 2225.73 3089.8 305.73 294.78 300.13
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 20 1036.12 525.54 F
 3089.8 5434.83 524.7 F
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 2965.8 3089.8 546.76

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 133138

INPUT

Description: XS of Prop Intake Structure topo

Station	Elevation	Data	num=	168
Sta	Elev	Sta	Elev	Sta
0	580	98.84	575	142.72
190.18	556.9	212.47	552.32	249.29
337.05	531.53	378.13	526.16	398.84
527.87	515.07	540.33	513.93	577.78
640.63	509.9	657.42	509.93	706.9
788.39	515.34	827.34	516.87	876.15
970.7	523.77	1044.51	525.01	1046.1
1163.97	525.35	1198.54	517.26	1208.57
1217.07	515.07	1221.32	515.07	1230.78
1270.17	506.29	1297.94	505.71	1313.17
1325.71	506.3	1348.09	506.2	1357.94
1432.27	505.36	1504.86	504.96	1510.18
1639.14	505.33	1705.57	505.31	1734.06
1841.53	506.05	1862.73	505.87	1894.36
2003.97	503.27	2015.26	502.83	2068.99
2160.5	501.66	2181.41	490.51	2198.91
2398.91	480.2	2498.91	478.2	2543.91
2865.8	474.76	2965.8	474.76	3010.97
3089.8	526.18	3368.8	526.18	3465.8
3515.34	501	3875.92	513.7	3895.52
3955.56	514.7	3971.24	514.7	3977.73
4064.78	518.7	4119.33	519.7	4149.71
4197.66	522.7	4213.41	523.7	4215.79
4267.72	527.7	4295.73	528.7	4343.39
4421.63	532.7	4423.45	533.7	4434.29
4485.38	541.7	4514.79	541.7	4587.03
4676.66	544.7	4699.94	545.7	4738.93
4783.67	549.7	4790.77	550.7	4894.9
4937.98	568.7	4941.31	569.7	4944.79
4959.45	573.7	4963.98	574.7	4972.29
5073.48	579.7	5101.8	580.7	5145.44
5191.22	584.7	5206.88	585.7	5220.4
5271.66	589.7	5310.61	590.7	5322.52
5422.32	594.7	5435.44	595.7	5508.65

Manning's	n	Values	num=	4
Sta	n Val	Sta	n Val	Sta
0	.08	2138.84	.04	2965.8
			.014	3368.8
				.08

Bank Sta: Left Right Lengths: Left Channel Right
 2138.84 3089.8 688.72 690.68 684.84
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent

proposed.rep

0	1134.96	525.54	F
3089.8	5508.65	526.18	T

Blocked Obstructions num= 1

Sta L	Sta R	Elev
3005	3129	546.76

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 132450

INPUT

Description: FEMA CR topo

Station	Elevation	Data	num=	121
Sta	Elev	Sta	Elev	Sta
0	575	56	553.9	107
263	522.2	331	518.7	404
595	509.6	625	514.9	686
892	530.9	979	531.8	1003
1053	516.9	1057	516.9	1074
1210	501.9	1244	503.5	1324
1548	503	1602	504.7	1661
1856	502.2	1921	505.5	1950
2051.61	484.2	2161.61	482.2	2236.61
2466.61	474.2	2486.61	472.2	2511.61
2596.61	474.2	2646.61	476.2	2696.61
2786.61	484.2	2811.61	486.2	2816
2846.86	505.7	2849.12	506.7	2895.98
2919.39	508.7	2957.66	509.7	2974.43
3078.44	512.7	3125.14	511.7	3154.27
3203.88	507.7	3215.51	506.7	3367.67
3392.87	508.7	3396.25	507.7	3449.4
3679.6	510.7	3772.97	511.7	3816.173
3946.35	515.7	3951.57	516.7	3955.62
3975.93	518.7	3981.62	519.7	3983.08
4002.79	517.7	4026	521.4	4107
4223	527.5	4305	530.8	4377
4547	541.9	4584	541.9	4596
4740	556.2	4831	565	4862
4933	575			

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.08	1921	.04
		2849.12	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
1921	2849.12	406	410	329.99	.1	.3	

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	979	531.8	F
3078.44	4933	515	F

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 132040.*

INPUT

Description:

Station	Elevation	Data	num=	209
Sta	Elev	Sta	Elev	Sta
				Elev

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proposed.rep									
0	575	53.07	556.53	68.23	556.08	101.4	547.89	129.66	543.27
180.05	535.39	249.23	526.11	254.19	525.78	313.67	522.31	371.01	518.34
382.84	517.54	427.38	513.43	476.28	512.78	494.26	513.08	498.45	513.08
537.9	513.08	563.84	512.64	566.15	512.94	592.27	516.55	650.08	519.03
685.54	519.59	704.09	519.95	778.01	526.13	788.24	526.29	845.29	527.1
894.79	527.11	927.73	527.16	950.47	526.91	990.27	514.37	994.93	514.62
996.91	514.72	997.86	514.71	1001.65	514.67	1017.76	513.15	1036.01	506.53
1045.24	503.43	1085.99	503.12	1089.93	503.18	1146.63	503.42	1178.85	504.84
1206.75	504.93	1254.66	505.5	1292.77	506.56	1308.17	506.21	1331.28	507.13
1336.16	507.2	1342.83	507.2	1354.39	507.2	1399.32	504.38	1433.77	504.18
1466.93	502.47	1504.59	503.26	1518.11	503.15	1552.09	502.22	1574.02	502.86
1622.34	503.93	1653.51	504.23	1700.05	504.08	1739.52	503.47	1758.8	502.7
1820.4	504.38	1847.21	500.82	1857.56	495.14	1873.09	487.3	1874.94	486.22
1875.91	486.18	1941.14	484.52	2042.82	482.79	2112.15	481.1	2188.01	479.69
2204.59	479.36	2250.81	477.66	2324.76	475.89	2343.25	474.25	2366.36	472.6
2425.36	472.6	2443.97	474.31	2462.58	476.02	2492.92	476.98	2524.62	477.8
2549.21	478.43	2586.66	479.4	2636.29	481	2654.91	482.6	2698.33	484.2
2729.35	485.8	2734.8	486.84	2735	486.89	2751.89	491.79	2753.38	492.39
2753.41	492.4	2755.11	493.41	2773.09	504.4	2775.9	505.54	2825.2	506.22
2827.86	506.26	2833.48	506.74	2838.99	507.16	2849.83	508	2890.09	508.94
2907.74	509.8	2908.6	509.84	2925.33	510.78	2951.16	511.74	2955.51	511.86
2962.01	511.86	3001.24	511.76	3017.17	511.78	3054.65	511.23	3066.3	511.03
3096.95	510.2	3120.49	509.38	3121.42	509.34	3137.12	508.58	3149.15	507.78
3161.38	506.98	3194.87	506.98	3256.63	506.94	3317.55	506.8	3321.48	506.73
3327.28	507.43	3331.64	508.15	3340.92	507.98	3347.99	508.02	3351.55	507.24
3395.17	507.5	3407.47	507.51	3409.39	508.31	3443.02	509.14	3461.11	509.23
3513.69	508.97	3569.6	509.19	3594.64	509.39	3613	510.32	3624.69	509.44
3649.67	509.54	3659.74	509.62	3673.93	510.98	3683.11	509.85	3691.46	509.88
3732.35	510.21	3747.9	510.35	3784.93	511.03	3793.36	511.22	3854.2	512.2
3860.79	512.29	3901.78	513.02	3910.3	513.58	3930.32	515.38	3935.81	516.45
3940.07	517.46	3950.05	518.75	3950.18	518.76	3956.84	518.81	3961.44	518.85
3962.7	519.03	3965.21	519.36	3967.43	519.66	3967.71	519.66	3968.96	519.65
3976.89	518.96	3979.57	518.67	3983.09	517.75	3989.7	517.52	3994.42	517.93
4014.12	520.71	4036.15	521.86	4088.73	523.75	4099.34	524.24	4148.82	526.03
4170.89	526.58	4199.73	527.01	4210.87	527.18	4221.39	527.21	4236.45	527.72
4294.04	529.86	4307.67	530.4	4336.6	531.68	4369.15	532.85	4383.42	533.46
4423.4	534.63	4484.42	536.6	4486	536.68	4508.53	539.04	4520.22	539.66
4549.65	540.78	4552.77	541.14	4559.44	541.84	4562.28	542.14	4601.21	541.85
4613.83	541.03	4615.36	541.62	4620.15	543.63	4651.25	545.73	4668.54	547.88
4685.47	550.62	4732.21	554.97	4755.58	556.99	4765.34	557.76	4768.93	558.02
4804.82	560.7	4844.88	563.65	4861.08	564.72	4893.7	569.19	4899.96	569.41
4938.35	571.32	4942.1	571.77	4957.88	572.99	4968.4	575		

Manning's n Values num= 3
Sta n Val Sta n Val
0 .08 1820.4 .04 2775.9 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1820.4 2775.9 406 410 329.99 .1 .3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 131630.*

INPUT
Description:
Station Elevation Data num= 209
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 575 50.13 559.16 64.46 558.26 95.79 550.87 122.5 546.36
170.1 538.99 235.45 530.03 240.14 529.64 296.33 525.93 350.51 521.88
361.69 521.09 403.76 517.26 449.96 515.96 466.94 516.56 470.91 516.56

proposed.rep									
508.18	516.56	532.68	515.68	534.86	515.86	559.54	518.2	614.15	519.26
647.65	519.19	665.18	519.29	735.01	523.27	744.68	523.29	798.57	523.3
845.35	522.78	876.46	522.51	897.95	522.12	935.55	512.35	939.95	512.49
941.82	512.54	942.71	512.52	946.29	512.44	961.51	511.09	978.76	505.9
987.47	503.75	1025.97	504.33	1029.7	504.46	1083.27	504.95	1113.71	506.18
1140.06	506.4	1185.33	507.61	1221.32	509.02	1235.88	508.03	1257.71	509.45
1262.32	509.5	1268.63	509.5	1279.54	509.5	1321.99	503.86	1354.53	503.47
1385.87	501.95	1421.44	502.27	1434.21	501.61	1466.32	499.44	1487.03	500.53
1532.69	502.66	1562.13	503.75	1606.1	504.16	1643.39	504.15	1661.61	503.2
1719.8	503.26	1744.42	498.45	1753.92	493.35	1768.18	487.09	1769.88	486.24
1770.77	486.18	1830.66	484.83	1924.03	483.37	1987.69	481.99	2057.35	480.82
2072.57	480.53	2115.01	479.12	2182.91	477.59	2199.89	476.3	2221.11	475
2284.11	475	2306.33	476.42	2328.55	477.84	2364.77	478.79	2402.63	479.4
2432	479.88	2476.71	480.6	2535.98	481.8	2558.2	483	2610.06	484.2
2647.1	485.4	2653.6	486.18	2653.83	486.22	2674	490.39	2675.78	491.09
2675.83	491.11	2677.86	492.12	2699.32	503.1	2702.67	504.38	2754.42	505.75
2757.21	505.82	2763.11	506.28	2768.89	506.62	2780.27	507.29	2822.53	508.17
2841.05	508.89	2841.95	508.93	2859.51	509.86	2886.62	510.93	2891.19	511.02
2898.01	511.02	2939.18	510.82	2955.9	510.87	2995.24	510.52	3007.47	510.36
3039.63	509.7	3064.34	509.06	3065.32	509.03	3081.79	508.46	3094.42	507.86
3107.26	507.26	3142.4	507.26	3207.22	507.18	3271.17	506.9	3275.28	506.76
3281.38	507.15	3285.95	507.59	3295.69	507.26	3303.11	507.34	3306.84	506.79
3352.63	507.3	3365.53	507.32	3367.55	507.93	3402.84	508.59	3421.83	508.67
3477.01	507.91	3535.7	508.07	3561.98	508.34	3581.25	510.11	3593.52	508.31
3619.73	508.38	3630.31	508.44	3645.2	511.01	3654.83	508.66	3663.59	508.64
3706.51	508.89	3722.83	509	3761.7	509.55	3770.54	509.73	3834.4	510.8
3841.31	510.88	3884.33	511.52	3893.28	512.47	3914.29	515.05	3920.05	516.19
3924.53	517.22	3934.99	518.81	3935.14	518.82	3942.13	518.93	3946.95	519
3948.28	519.15	3950.9	519.4	3953.24	519.62	3953.53	519.62	3954.85	519.59
3963.17	518.97	3965.98	518.64	3969.68	517.8	3976.61	517.34	3981.56	517.45
4002.24	520.01	4025.36	521.42	4080.55	523.04	4091.69	523.59	4143.61	525.77
4166.78	526.26	4197.05	526.68	4208.74	526.85	4219.78	526.92	4235.59	527.37
4296.03	529.45	4310.33	529.99	4340.7	531.26	4374.87	532.14	4389.84	532.72
4431.8	533.95	4495.84	536.21	4497.5	536.28	4521.15	539.93	4533.41	540.62
4564.31	541.46	4567.58	541.73	4574.58	542.18	4577.56	542.38	4618.42	541.79
4631.67	541.06	4633.27	541.49	4638.29	543.15	4670.94	545.74	4689.09	549.15
4706.85	552.97	4755.91	557.03	4780.43	558.74	4790.68	559.32	4794.45	559.52
4832.11	561.58	4874.16	563.79	4891.17	564.43	4925.4	567.48	4931.97	567.58
4972.27	569.34	4976.19	570.04	4992.76	572.48	5003.8	575		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.08	1719.8	.04
		2702.67	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1719.8	2702.67		406	410	329.99	.1
							.3

CROSS SECTION

RIVER: Susquehanna
 REACH: 1

RS: 131220.*

INPUT

Description:

Station Elevation Data				num= 209			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	47.2	561.8	60.69	560.43	90.19	553.86
160.15	542.58	221.68	533.94	226.09	533.49	279	529.54
340.53	524.63	380.15	521.09	423.64	519.14	439.63	520.04
478.45	520.04	501.52	518.72	503.57	518.77	526.81	519.85
609.77	518.79	626.27	518.64	692.02	520.4	701.12	520.3
795.9	518.46	825.19	517.87	845.42	517.33	880.82	510.32

proposed.rep									
886.72	510.36	887.57	510.33	890.94	510.21	905.27	509.04	921.51	505.27
929.71	504.08	965.96	505.55	969.46	505.74	1019.9	506.47	1048.56	507.52
1073.38	507.87	1115.99	509.71	1149.88	511.48	1163.59	509.85	1184.14	511.76
1188.48	511.8	1194.42	511.8	1204.69	511.8	1244.66	503.34	1275.3	502.75
1304.8	501.42	1338.3	501.28	1350.32	500.06	1380.54	496.66	1400.05	498.19
1443.04	501.4	1470.75	503.27	1512.15	504.25	1547.26	504.84	1564.41	503.7
1619.2	502.14	1641.62	496.07	1650.28	491.57	1663.27	486.89	1664.82	486.26
1665.63	486.19	1720.19	485.15	1805.24	483.96	1863.23	482.89	1926.68	481.94
1940.55	481.69	1979.21	480.58	2041.06	479.28	2056.52	478.36	2075.85	477.4
2142.85	477.4	2168.69	478.53	2194.53	479.66	2236.63	480.59	2280.65	481
2314.78	481.32	2366.77	481.8	2435.66	482.6	2461.5	483.4	2521.78	484.2
2564.84	485	2572.4	485.52	2572.67	485.55	2596.12	489	2598.19	489.8
2598.24	489.81	2600.6	490.83	2625.56	501.8	2629.45	503.22	2683.64	505.27
2686.56	505.39	2692.74	505.82	2698.8	506.08	2710.71	506.59	2754.96	507.41
2774.35	507.99	2775.3	508.02	2793.69	508.94	2822.08	510.12	2826.86	510.18
2834.01	510.18	2877.12	509.88	2894.63	509.95	2935.83	509.81	2948.63	509.69
2982.32	509.21	3008.18	508.74	3009.21	508.72	3026.47	508.34	3039.68	507.94
3053.13	507.54	3089.93	507.54	3157.81	507.42	3224.78	507	3229.09	506.79
3235.47	506.88	3240.26	507.04	3250.46	506.54	3258.23	506.67	3262.14	506.33
3310.09	507.1	3323.6	507.13	3325.71	507.54	3362.67	508.03	3382.55	508.12
3440.34	506.84	3501.8	506.95	3529.32	507.29	3549.5	509.91	3562.34	507.17
3589.8	507.22	3600.87	507.26	3616.46	511.04	3626.56	507.48	3635.73	507.39
3680.68	507.56	3697.77	507.66	3738.47	508.07	3747.73	508.25	3814.6	509.4
3821.84	509.47	3866.89	510.01	3876.25	511.35	3898.26	514.73	3904.3	515.94
3908.98	516.98	3919.94	518.86	3920.09	518.88	3927.41	519.04	3932.47	519.15
3933.85	519.26	3936.6	519.43	3939.05	519.58	3939.35	519.58	3940.73	519.54
3949.45	518.98	3952.39	518.6	3956.26	517.84	3963.53	517.16	3968.71	516.97
3990.37	519.32	4014.57	520.98	4072.36	522.33	4084.03	522.93	4138.41	525.51
4162.67	525.94	4194.37	526.35	4206.61	526.53	4218.17	526.63	4234.73	527.01
4298.02	529.03	4312.99	529.59	4344.8	530.84	4380.58	531.42	4396.25	531.98
4440.2	533.26	4507.27	535.81	4509	535.89	4533.77	540.82	4546.61	541.58
4578.96	542.14	4582.38	542.32	4589.72	542.52	4592.84	542.62	4635.62	541.74
4649.5	541.09	4651.18	541.36	4656.44	542.68	4690.63	545.76	4709.63	550.43
4728.23	555.31	4779.6	559.09	4805.29	560.49	4816.02	560.88	4819.96	561.01
4859.41	562.45	4903.44	563.92	4921.25	564.15	4957.1	565.76	4963.98	565.75
5006.18	567.36	5010.29	568.31	5027.64	571.96	5039.2	575		

Manning's n Values num= 3
Sta n Val Sta n Val
0 .08 1619.2 .04 2629.45 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1619.2 2629.45 406 410 329.99 .1 .3

CROSS SECTION

RIVER: Susquehanna
REACH: 1 RS: 130810.*

INPUT									
Description:									
Station Elevation Data num= 209									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	44.27	564.43	56.92	562.61	84.59	556.84	108.17	552.52
150.2	546.18	207.91	537.86	212.05	537.35	261.66	533.16	309.5	528.96
319.37	528.17	356.53	524.92	397.32	522.32	412.31	523.52	415.82	523.52
448.73	523.52	470.36	521.76	472.29	521.69	494.08	521.5	542.3	519.73
571.88	518.4	587.36	517.99	649.02	517.54	657.56	517.3	705.15	515.69
746.45	514.13	773.92	513.23	792.9	512.53	826.1	508.3	829.98	508.23
831.63	508.18	832.42	508.14	835.59	507.99	849.02	506.99	864.25	504.63
871.95	504.41	905.94	506.77	909.23	507.02	956.54	507.99	983.41	508.86
1006.69	509.33	1046.66	511.82	1078.44	513.94	1091.29	511.68	1110.57	514.08

proposed.rep									
1114.64	514.1	1120.21	514.1	1129.85	514.1	1167.33	502.82	1196.07	502.03
1223.73	500.9	1255.15	500.29	1266.42	498.51	1294.77	493.88	1313.06	495.86
1353.38	500.13	1379.38	502.78	1418.2	504.33	1451.13	505.52	1467.22	504.2
1518.6	501.02	1538.83	493.69	1546.64	489.78	1558.36	486.68	1559.76	486.28
1560.49	486.19	1609.71	485.47	1686.45	484.54	1738.77	483.79	1796.02	483.07
1808.52	482.85	1843.4	482.04	1899.21	480.97	1913.16	480.41	1930.6	479.8
2001.6	479.8	2031.05	480.64	2060.5	481.48	2108.49	482.4	2158.66	482.6
2197.57	482.76	2256.82	483	2335.34	483.4	2364.79	483.8	2433.5	484.2
2482.58	484.6	2491.2	484.86	2491.51	484.87	2518.23	487.6	2520.59	488.5
2520.65	488.52	2523.34	489.54	2551.79	500.5	2556.22	502.06	2612.85	504.8
2615.91	504.95	2622.37	505.36	2628.7	505.54	2641.15	505.89	2687.39	506.64
2707.66	507.09	2708.65	507.11	2727.87	508.02	2757.54	509.31	2762.54	509.34
2770	509.34	2815.06	508.94	2833.36	509.04	2876.41	509.11	2889.79	509.02
2925	508.71	2952.03	508.42	2953.11	508.41	2971.14	508.22	2984.95	508.02
2999.01	507.82	3037.47	507.82	3108.41	507.66	3178.39	507.1	3182.89	506.82
3189.56	506.6	3194.57	506.49	3205.23	505.82	3213.35	505.99	3217.43	505.87
3267.54	506.9	3281.66	506.94	3283.88	507.15	3322.5	507.47	3343.28	507.56
3403.67	505.77	3467.9	505.82	3496.66	506.25	3517.75	509.7	3531.17	506.04
3559.86	506.06	3571.44	506.08	3587.73	511.07	3598.28	506.29	3607.86	506.15
3654.84	506.23	3672.7	506.31	3715.23	506.58	3724.91	506.77	3794.8	508
3802.36	508.06	3849.44	508.51	3859.23	510.23	3882.23	514.4	3888.54	515.69
3893.43	516.73	3904.89	518.91	3905.05	518.94	3912.7	519.15	3917.98	519.3
3919.43	519.38	3922.3	519.47	3924.85	519.54	3925.18	519.54	3926.62	519.49
3935.72	518.99	3938.8	518.57	3942.85	517.89	3950.44	516.99	3955.85	516.48
3978.49	518.63	4003.79	520.54	4064.18	521.61	4076.38	522.28	4133.2	525.26
4158.55	525.62	4191.68	526.03	4204.48	526.21	4216.56	526.34	4233.86	526.66
4300.01	528.62	4315.66	529.18	4348.9	530.42	4386.29	530.71	4402.67	531.24
4448.6	532.58	4518.69	535.42	4520.5	535.49	4546.38	541.71	4559.8	542.54
4593.62	542.82	4597.19	542.91	4604.86	542.86	4608.12	542.85	4652.83	541.69
4667.33	541.13	4669.09	541.23	4674.59	542.2	4710.31	545.78	4730.18	551.7
4749.62	557.66	4803.3	561.14	4830.14	562.25	4841.36	562.44	4845.48	562.51
4886.7	563.33	4932.72	564.06	4951.33	563.87	4988.8	564.05	4995.99	563.93
5040.09	565.38	5044.39	566.58	5062.51	571.45	5074.6	575		

Manning's n Values num= 3
Sta n Val Sta n Val
0 .08 1518.6 .04 2556.22 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1518.6 2556.22 406 410 329.99 .1 .3

CROSS SECTION

RIVER: Susquehanna
REACH: 1

RS: 130400

INPUT

Description: FEMA CQ

Station Elevation Data

num= 94									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	101	555.6	198	541.2	289	532.5	371	525.5
385	527	419	527	441	524.6	534	518	614	514.3
697	509.8	775	506.1	807	504	849	508.3	940	510.8
1007	516.4	1019	513.5	1037	516.4	1046	516.4	1055	516.4
1090	502.3	1172	499.3	1209	491.1	1288	502.3	1355	506.2
1418	499.9	1443	488	1455.35	486.2	1665.35	484.2	1785.35	482.2
1860.35	482.2	1980.35	484.2	2080.35	484.2	2410.35	484.2	2440.35	486.2
2443	487.2	2483	500.9	2552	504.9	2642	506.2	2693	508.5
2706	508.5	2753	508	2817	508.4	2897	508.1	2985	508.1
3059	507.9	3132	507.2	3160	505.1	3225	506.7	3304	507
3367	504.7	3434	504.7	3464	505.2	3486	509.5	3500	504.9
3542	504.9	3559	511.1	3570	505.1	3580	504.9	3629	504.9

				proposed.rep					
3692	505.1	3775	506.6	3832	507	3890	519	3905	519.5
3908	519.5	3911	519.5	3922	519	3943	516	3993	520.1
4056	520.9	4128	525	4189	525.7	4233	526.3	4302	528.2
4353	530	4392	530	4457	531.9	4532	535.1	4559	542.6
4573	543.5	4612	543.5	4620	543.2	4687	541.1	4730	545.8
4771	560	4827	563.2	4855	564	4871	564	4914	564.2
4962	564.2	5028	562.1	5074	563.4	5110	575		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	1418	.04	2483	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff	Contr.	Expan.
1418	2483	2400	1704.99	1200	.1	.3	

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 128690

INPUT

Description:

Station Elevation Data		num= 93							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	575	60	571.1	110	568.2	196	554.9	217	555.6
234	553.2	272	550.7	284	550.7	355	549.1	435	547.2
499	543.6	563	542.1	577	542.1	629	540.2	724	538.8
750	536.1	769	536.1	793	536.2	823	517	831	517
852	516.1	923	487.1	933.06	486.2	983.06	484.2	1093.06	482.2
1143.06	480.2	1243.06	478.2	1318.06	476.2	1368.06	476.2	1443.06	478.2
1483.06	480.2	1553.06	482.2	1628.06	484.2	1668.06	486.2	1670	487.1
1713	501.4	1787	506	1841	505.8	1857	505.8	1913	505.1
1935	505.1	1994	506.3	2062	508.1	2090	508.1	2160	507.2
2253	506.6	2348	505.9	2414	503	2422	500.8	2461	500.8
2487	503.8	2547	504.8	2568	504.8	2594	501.2	2676	499.9
2709	501.1	2732	507	2790	506.3	2839	510.7	2866	510.7
2879	509.9	2892	504.8	2926	504.8	2943	511.1	2973	517.2
2993	517.2	3002	519.9	3014	520.5	3023	520.5	3033	520
3063	527.2	3141	535	3232	542.1	3303	547.3	3402	550.8
3481	553.2	3558	557.1	3603	559.8	3703	565.8	3784	566.7
3825	566	3852	566.3	3882	567.3	3940	567	4007	566.3
4047	565.8	4076	565.5	4115	564.3	4124	563.8	4166	565.2
4273	558.1	4382	550.4	4477	575				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	852	.04	1713	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff	Contr.	Expan.
852	1713	970	890	900	.1	.3	

CROSS SECTION

RIVER: Susquehanna
 REACH: 1 RS: 127800

INPUT

Description: FEMA CP

Station Elevation Data		num= 66							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	562	104	559	200	554.9	304	553.7	402	549.9

				proposed.rep					
505	546.8	605	544.6	703	543	753	541.2	773	541.2
838	539.2	877	517.5	892	518	897	518	906	516.1
929	507.4	985	504.9	1020	501	1074	499.9	1098	487
1100	486.2	1150	484.2	1275	482.2	1315	480.2	1425	478.2
1500	476.2	1550	476.2	1630	478.2	1670	480.2	1730	482.2
1805	484.2	1835	486.2	1929	487	1957	501.4	2008	503.2
2080	505.1	2105	505.1	2116	505.1	2167	504.4	2188	504.8
2242	506.2	2272	504.9	2297	495.2	2339	492.3	2391	495.2
2439	503.6	2510	506	2582	505	2601	504.2	2629	510.5
2642	510.5	2654	504.7	2687	504.7	2710	510.9	2760	512.1
2787	520	2803	520.7	2808	520.7	2819	520.1	2843	530.1
2894	542.4	2958	554.8	3032	560.7	3131	566.9	3221	570.2
3274	575								

Manning's n Values
Sta 0 n Val .1 Sta 1074 n Val .04 num= 3 Sta 1957 n Val .06

Bank Sta: Left 1074 Right 1957 Lengths: Left 1015 Channel 945 Right 960 Coeff Contr. .1 Expan. .3

Profile Output Table - Standard Table 1

Reach Crit W.S.	River Sta E.G. Elev	Profile Slope	Vel Chnl	Q Total Flow Area	Min Ch El Top width	W.S. Elev Froude # Chl
(ft)	(ft)	(ft/ft)	(ft/s)	(cfs) (sq ft)	(ft)	(ft)
1	139600 512.18	10 yr 0.000357	6.21	167000.00 28595.08	481.50 2039.81	511.59 0.21
1	139600 516.83	50 yr 0.000388	7.10	232000.00 38166.47	481.50 2253.16	516.09 0.22
1	139600 518.56	100 yr 0.000400	7.44	260000.00 42088.54	481.50 2459.19	517.75 0.23
1	139600 522.96	500 yr 0.000415	8.17	340000.00 53226.06	481.50 2710.93	522.02 0.24
1	139600 519.67	100-yr encroachm 0.000416	7.70	260000.00 33757.00	481.50 1001.01	518.75 0.23
1	137275 510.99	10 yr 0.000516	7.38	167000.00 25723.65	476.20 2411.66	510.16 0.25
1	137275 515.62	50 yr 0.000492	8.02	232000.00 39884.19	476.20 3379.22	514.72 0.26
1	137275 517.35	100 yr 0.000472	8.16	260000.00 45805.39	476.20 3452.90	516.45 0.25
1	137275 521.80	500 yr 0.000427	8.45	340000.00 61633.96	476.20 3633.72	520.92 0.25

			proposed.rep			
1	137275 518.33	100-yr encroachm 0.000559	8.99	260000.00 31618.68	476.20 1338.00	517.11 0.28
1	134600 493.47	10 yr 0.000522	7.14	167000.00 25439.10	480.20 1930.98	508.63 0.25
1	134600 496.07	50 yr 0.000531	8.01	232000.00 34235.08	480.20 3555.06	513.19 0.26
1	134600 497.11	100 yr 0.000526	8.26	260000.00 38874.81	480.20 3825.52	514.94 0.26
1	134600 499.87	500 yr 0.000505	8.83	340000.00 51419.86	480.20 4125.90	519.49 0.26
1	134600 497.11	100-yr encroachm 0.000482	8.04	260000.00 38434.72	480.20 1877.57	515.82 0.25
1	133431 488.34	10 yr 0.000432	7.27	167000.00 26206.30	472.50 1781.16	508.06 0.23
1	133431 491.41	50 yr 0.000493	8.47	232000.00 34118.30	472.50 2230.68	512.48 0.25
1	133431 492.61	100 yr 0.000514	8.91	260000.00 37140.81	472.50 2328.77	514.16 0.26
1	133431 495.82	500 yr 0.000564	10.02	340000.00 45132.70	472.50 2734.98	518.51 0.28
1	133431 492.61	100-yr encroachm 0.000465	8.62	260000.00 38901.96	472.50 1837.28	515.13 0.25
1	133138 488.87	10 yr 0.000341	6.58	167000.00 27883.77	474.40 1963.77	508.05 0.22
1	133138 491.57	50 yr 0.000387	7.70	232000.00 35623.61	474.40 2312.08	512.47 0.23
1	133138 492.64	100 yr 0.000404	8.12	260000.00 38577.80	474.40 2401.51	514.15 0.24
1	133138 495.51	500 yr 0.000443	9.19	340000.00 46387.25	474.40 2828.26	518.49 0.26
1	133138 492.65	100-yr encroachm 0.000365	7.86	260000.00 40302.54	474.40 1797.59	515.12 0.23
1	132450 489.53	10 yr 0.000384	6.52	167000.00 28467.38	470.20 2043.27	507.81 0.22

proposed.rep

1	132450	50 yr		232000.00	470.20	512.22
492.19	513.07	0.000421	7.54	36723.05	2806.81	0.24
1	132450	100 yr		260000.00	470.20	513.90
493.25	514.82	0.000434	7.93	40041.43	3026.76	0.24
1	132450	500 yr		340000.00	470.20	518.34
496.05	519.34	0.000428	8.56	56130.57	3276.41	0.25
1	132450	100-yr encroachm		260000.00	470.20	514.90
493.24	515.75	0.000386	7.63	42052.75	2003.73	0.23
1	130400	10 yr		167000.00	482.20	506.78
	507.51	0.000566	6.93	26871.45	2206.41	0.26
1	130400	50 yr		232000.00	482.20	511.26
	512.10	0.000536	7.63	39338.38	3060.18	0.26
1	130400	100 yr		260000.00	482.20	512.97
	513.84	0.000520	7.84	44648.72	3124.96	0.26
1	130400	500 yr		340000.00	482.20	517.46
	518.40	0.000487	8.37	59174.95	3365.02	0.26
1	130400	100-yr encroachm		260000.00	482.20	513.95
	514.85	0.000497	7.84	39327.08	1923.92	0.26
1	128690	10 yr		167000.00	476.20	505.13
	506.29	0.000851	8.69	20191.82	1314.88	0.32
1	128690	50 yr		232000.00	476.20	509.44
	510.89	0.000882	9.84	27827.54	2015.02	0.33
1	128690	100 yr		260000.00	476.20	511.14
	512.66	0.000875	10.17	31290.12	2079.02	0.34
1	128690	500 yr		340000.00	476.20	515.65
	517.29	0.000831	10.84	40741.19	2112.24	0.33
1	128690	100-yr encroachm		260000.00	476.20	512.10
	513.69	0.000847	10.22	27356.50	1228.21	0.33
1	127800	10 yr		167000.00	476.20	504.50
492.07	505.53	0.000780	8.22	21646.01	1282.26	0.31
1	127800	50 yr		232000.00	476.20	508.80
494.79	510.10	0.000799	9.35	28737.90	1752.84	0.32
1	127800	100 yr		260000.00	476.20	510.50
495.92	511.87	0.000790	9.69	31736.34	1774.71	0.32
1	127800	500 yr		340000.00	476.20	515.00
498.70	516.55	0.000762	10.49	40003.56	1861.00	0.32

proposed.rep

1	127800	100-yr encroachm	260000.00	476.20	511.50
495.74	512.93	0.000760	29288.21	1323.84	0.32

Appendix J:
Bathymetry Data

ECOLOGICAL STUDIES OF THE SUSQUEHANNA RIVER
IN THE VICINITY OF THE
SUSQUEHANNA STEAM ELECTRIC STATION

1983 Annual Report

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Prepared For

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Two North Ninth Street
Allentown, Pennsylvania 18101

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301 Forest Drive
Ithaca, New York 14850

August 1984

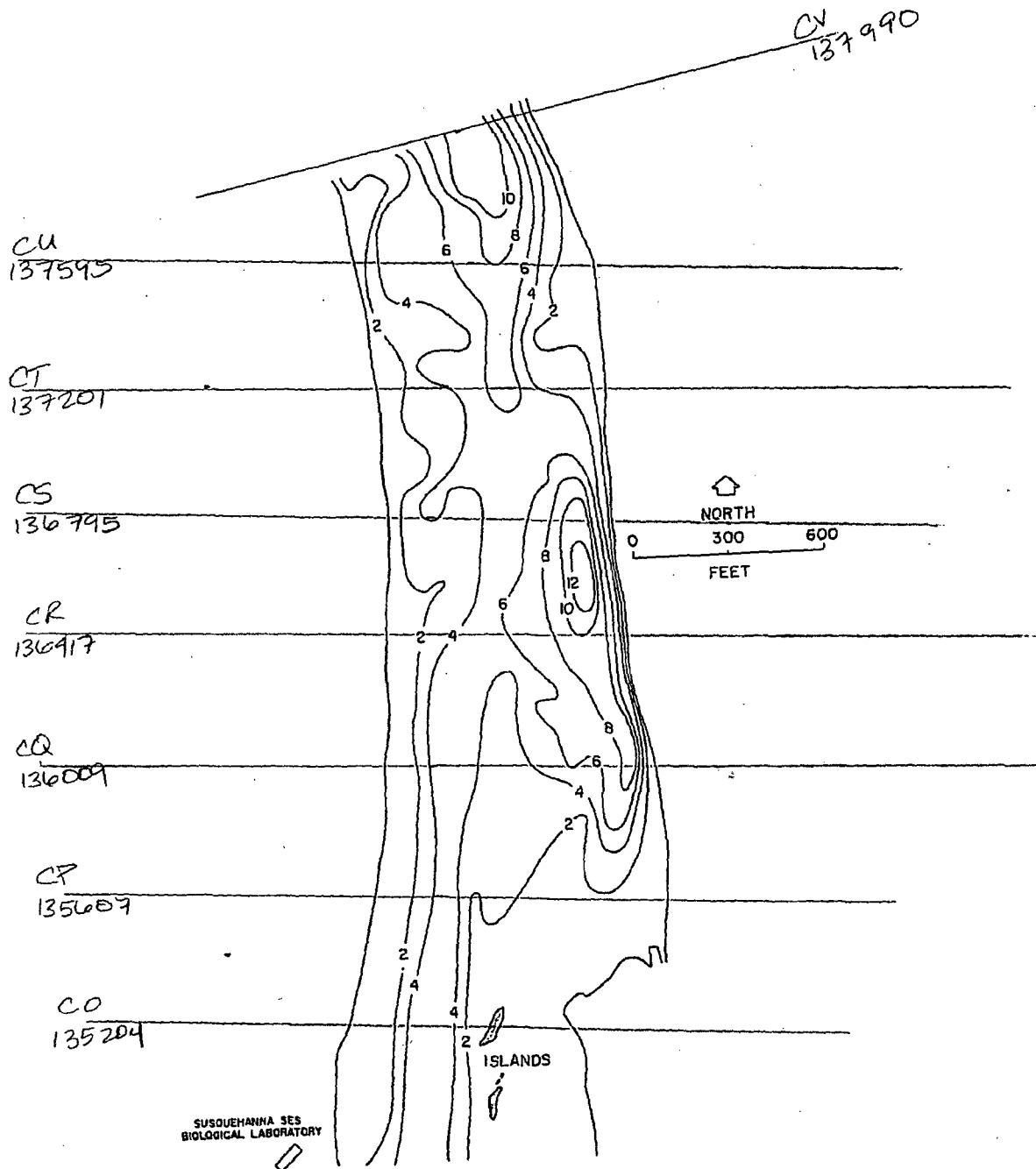


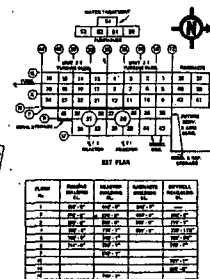
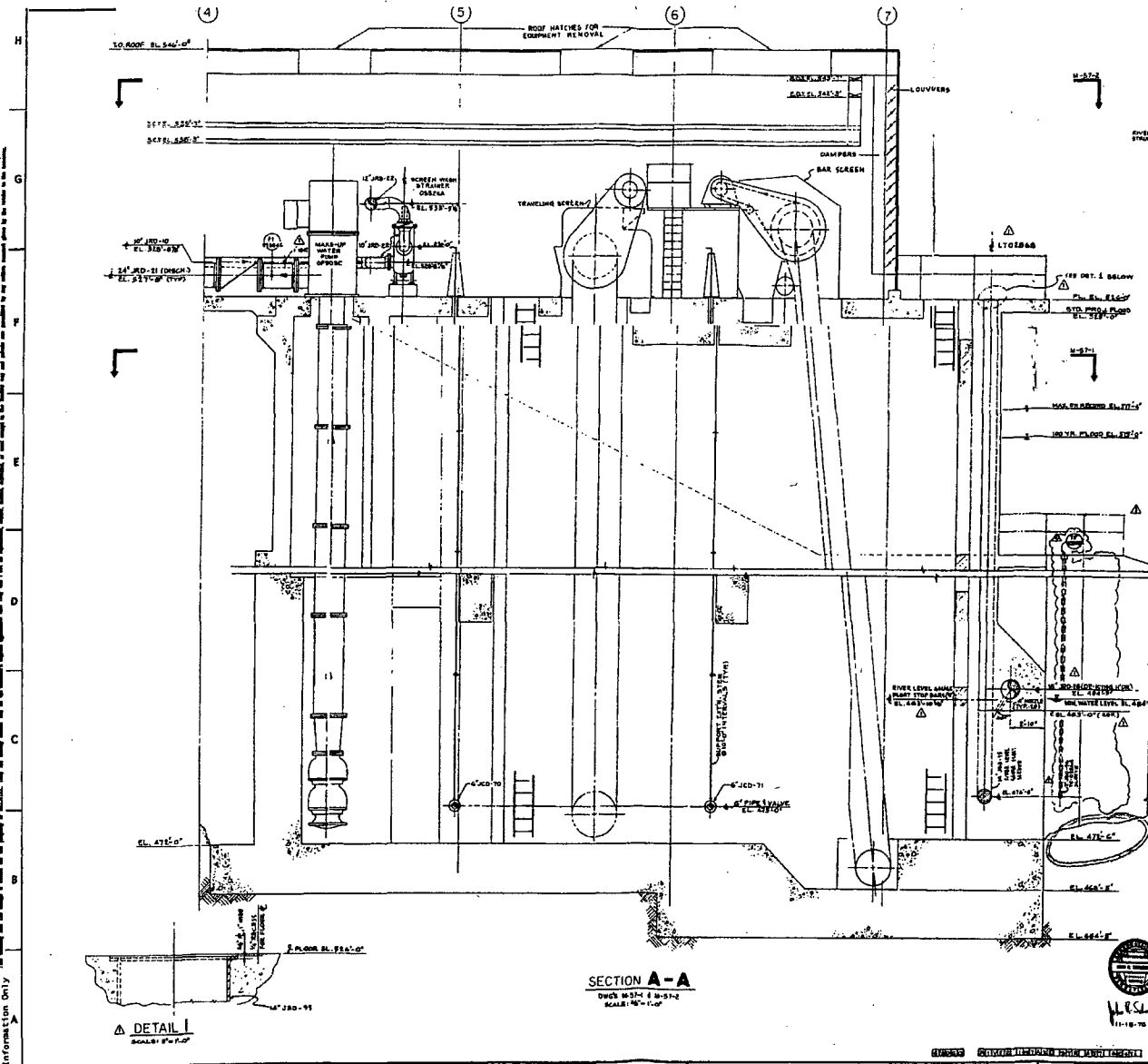
Fig. A-3

Section A (see Fig. A-2) depth contours (2-ft intervals) of the Susquehanna River, 1983.

Appendix K:
Supplemental Intake Structure Information

- Existing Structure Detail
- Photographs of Existing and Proposed Site
- Details of Proposed Structure

Existing Intake Structure Detail



- NOTES:
1. REVISION 'D' RELEASES THE FOLLOWING SYSTEM FOR CONSTRUCTION:
MAKE-UP WATER SUPPLY.
28D-11
28D-12
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28D-100
 2. REVISION 'E' RELEASES THE FOLLOWING SYSTEM FOR CONSTRUCTION:
MAKE-UP WATER SUPPLY.
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28D-100
 3. REVISION 'F' RELEASES THE FOLLOWING SYSTEM FOR CONSTRUCTION:
MAKE-UP WATER SUPPLY.
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 4. REVISION 'G' RELEASES THE FOLLOWING SYSTEM FOR CONSTRUCTION:
MAKE-UP WATER SUPPLY.
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28D-100

SECTION A-A
DWG. M-31-1 & M-31-2
SCALE: 1/8"=1'-0"

REVISION	DATE	BY	CHKD.
1	11-10-70	WES	WES
2	11-10-70	WES	WES
3	11-10-70	WES	WES
4	11-10-70	WES	WES
5	11-10-70	WES	WES
6	11-10-70	WES	WES
7	11-10-70	WES	WES
8	11-10-70	WES	WES
9	11-10-70	WES	WES
10	11-10-70	WES	WES
11	11-10-70	WES	WES
12	11-10-70	WES	WES
13	11-10-70	WES	WES
14	11-10-70	WES	WES
15	11-10-70	WES	WES
16	11-10-70	WES	WES
17	11-10-70	WES	WES
18	11-10-70	WES	WES
19	11-10-70	WES	WES
20	11-10-70	WES	WES
21	11-10-70	WES	WES
22	11-10-70	WES	WES
23	11-10-70	WES	WES
24	11-10-70	WES	WES
25	11-10-70	WES	WES
26	11-10-70	WES	WES
27	11-10-70	WES	WES
28	11-10-70	WES	WES
29	11-10-70	WES	WES
30	11-10-70	WES	WES
31	11-10-70	WES	WES
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35	11-10-70	WES	WES
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37	11-10-70	WES	WES
38	11-10-70	WES	WES
39	11-10-70	WES	WES
40	11-10-70	WES	WES
41	11-10-70	WES	WES
42	11-10-70	WES	WES
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45	11-10-70	WES	WES
46	11-10-70	WES	WES
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50	11-10-70	WES	WES
51	11-10-70	WES	WES
52	11-10-70	WES	WES
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54	11-10-70	WES	WES
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62	11-10-70	WES	WES
63	11-10-70	WES	WES
64	11-10-70	WES	WES
65	11-10-70	WES	WES
66	11-10-70	WES	WES
67	11-10-70	WES	WES
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69	11-10-70	WES	WES
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72	11-10-70	WES	WES
73	11-10-70	WES	WES
74	11-10-70	WES	WES
75	11-10-70	WES	WES
76	11-10-70	WES	WES
77	11-10-70	WES	WES
78	11-10-70	WES	WES
79	11-10-70	WES	WES
80	11-10-70	WES	WES
81	11-10-70	WES	WES
82	11-10-70	WES	WES
83	11-10-70	WES	WES
84	11-10-70	WES	WES
85	11-10-70	WES	WES
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89	11-10-70	WES	WES
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91	11-10-70	WES	WES
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93	11-10-70	WES	WES
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95	11-10-70	WES	WES
96	11-10-70	WES	WES
97	11-10-70	WES	WES
98	11-10-70	WES	WES
99	11-10-70	WES	WES
100	11-10-70	WES	WES

PENNSYLVANIA POWER & LIGHT COMPANY
PLANT DESIGN DRAWING
RIVER INTAKE STRUCTURE
AREA-A-57 SECTION A-A
DWG. NO. 11-10-70
E-162155 SH.3



Intake Structure Photograph Log

Susquehanna River Flood Study Report

Bell Bend Nuclear Power Plant

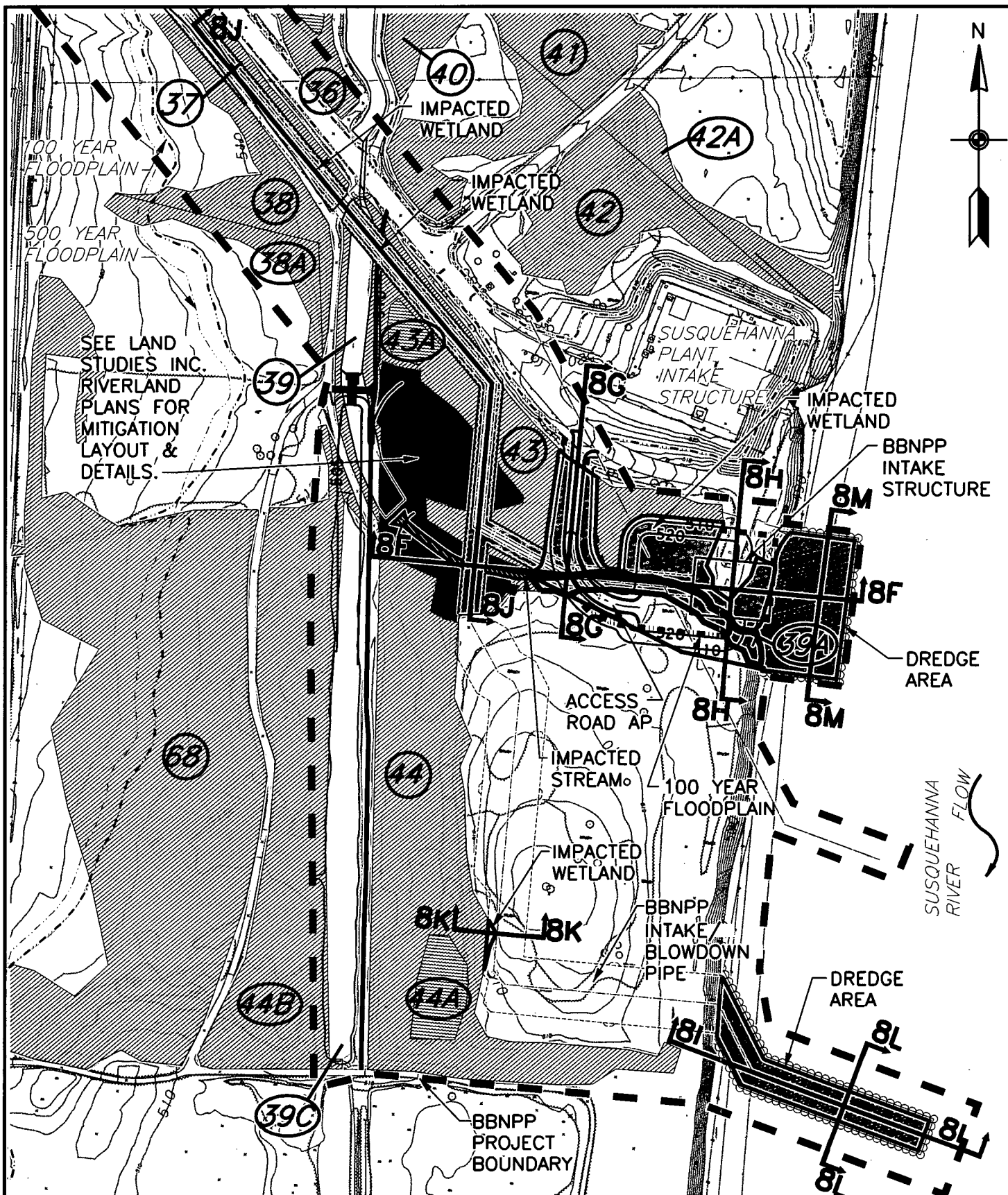
November 2010



Existing Intake Structure on the Susquehanna River, Station 1334+31



Susquehanna River, looking upstream of the Existing Intake Structure



Pennoni

Pennoni Associates Inc.
100 N. Wilkes-Barre Blvd.
Wilkes-Barre, PA 18702

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DRAWN BY: WCK

CHECKED BY: LGB

JOB No. PPLS 0902

HORZ. SCALE: 1"=200'

VERT. SCALE: N/A

JPA PERMIT SUBMITTAL

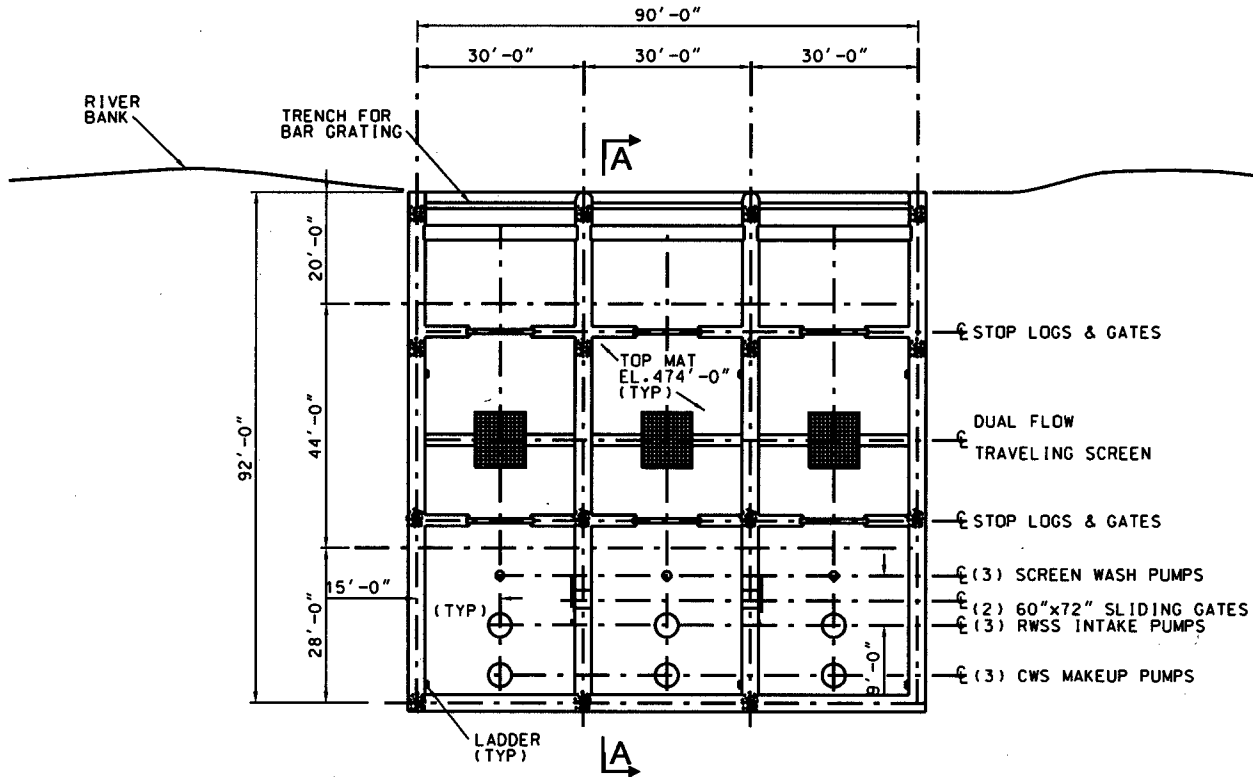
DATE:
04/08/2011

BELL BEND NUCLEAR POWER PLANT
LUZERNE COUNTY, PENNSYLVANIA

APPLICATION BY:
PPL NUCLEAR DEVELOPMENT, LLC

FIGURE 8A - SITE LAYOUT

SUSQUEHANNA RIVER
FLOW DIRECTION →



LOWER PLAN

TOP OF MAT EL 474'-0"
N.T.S.

FOR SECTION A-A
SEE FIGURE 8E

DRAWING SOURCE: S&L DRAWING NO.
12198-004-RWSS-004. REV. 2

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CHECKED BY: LGB

JOB No. PPLS 0902

HORZ. SCALE: N.T.S.
VERT. SCALE: N.T.S.

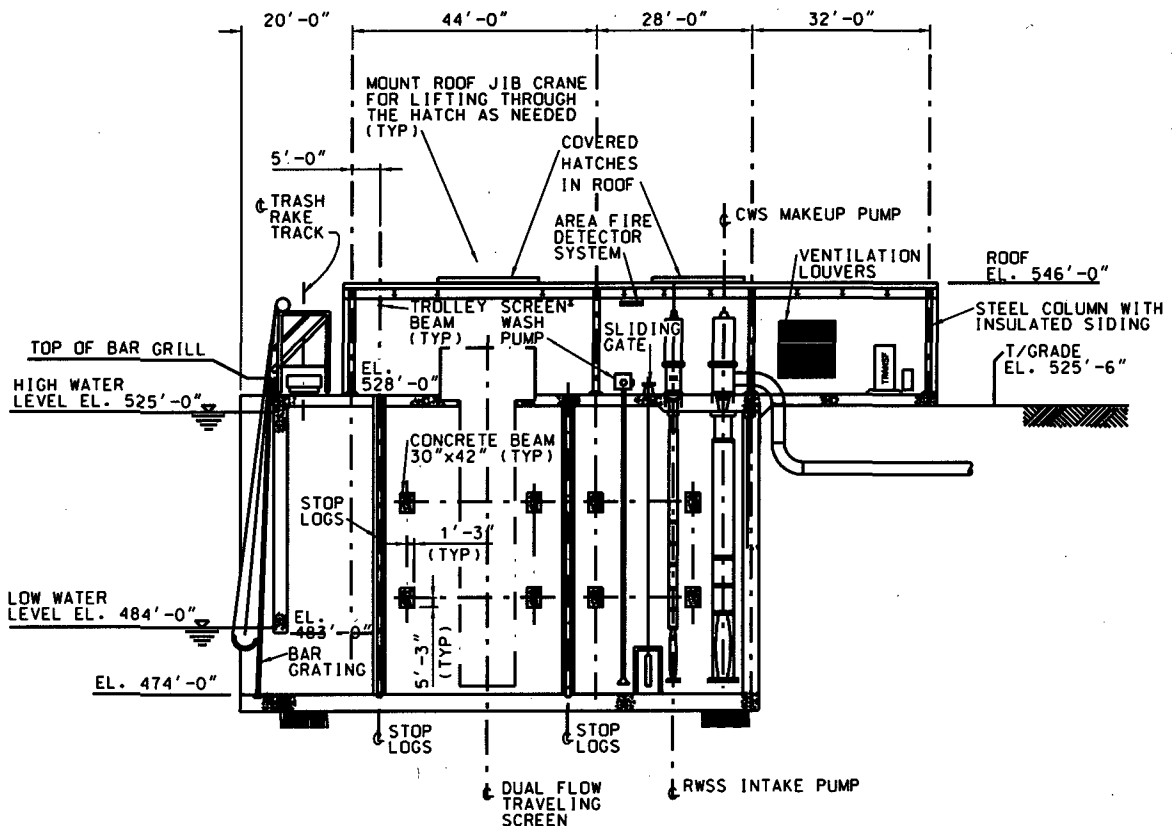
DATE:
04/08/2011

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BELL BEND NUCLEAR POWER PLANT
LUZERNE COUNTY, PENNSYLVANIA

APPLICATION BY:
PPL NUCLEAR DEVELOPMENT, LLC

FIGURE 8D - INTAKE STRUCTURE PLAN



SECTION A-A

N.T.S.

FOR SECTION LOCATION
SEE FIGURE 8D

DRAWING SOURCE: S&L DRAWING NO.
12198-004-RWSS-004. REV. 2

NOTE:
HIGH WATER AND LOW WATER ELEVATIONS
TAKEN FROM DRAWING "CONCEPTUAL INTAKE
STRUCTURE GENERAL ARRANGEMENT. BBNPP".
12198-004-RWSS-004. REV. 2. 05/23/2008
AND "SUSQUEHANNA STEAM ELECTRIC STATION"
FSAR. REV. 53. 04/1999 FIGURE 2.4-52.

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ON EXTENSIONS OF THE PROJECT OR ON ANY OTHER
PROJECT. ANY REUSE WITHOUT WRITTEN VERIFICATION
OR ADAPTATION BY PENNONI ASSOCIATES FOR THE
SPECIFIC PURPOSE INTENDED WILL BE AT OWNERS
SOLE RISK AND WITHOUT LIABILITY OR LEGAL
EXPOSURE TO PENNONI ASSOCIATES, AND OWNER
SHALL INDEMNIFY AND HOLD HARMLESS PENNONI
ASSOCIATES FROM ALL CLAIMS, DAMAGES, LOSSES AND
EXPENSES ARISING OUT OF OR RESULTING THEREFROM.

DRAWN BY: WCK

CHECKED BY: LGB

JOB No. PPLS 0902

HORZ. SCALE: N.T.S.
VERT. SCALE: N.T.S.

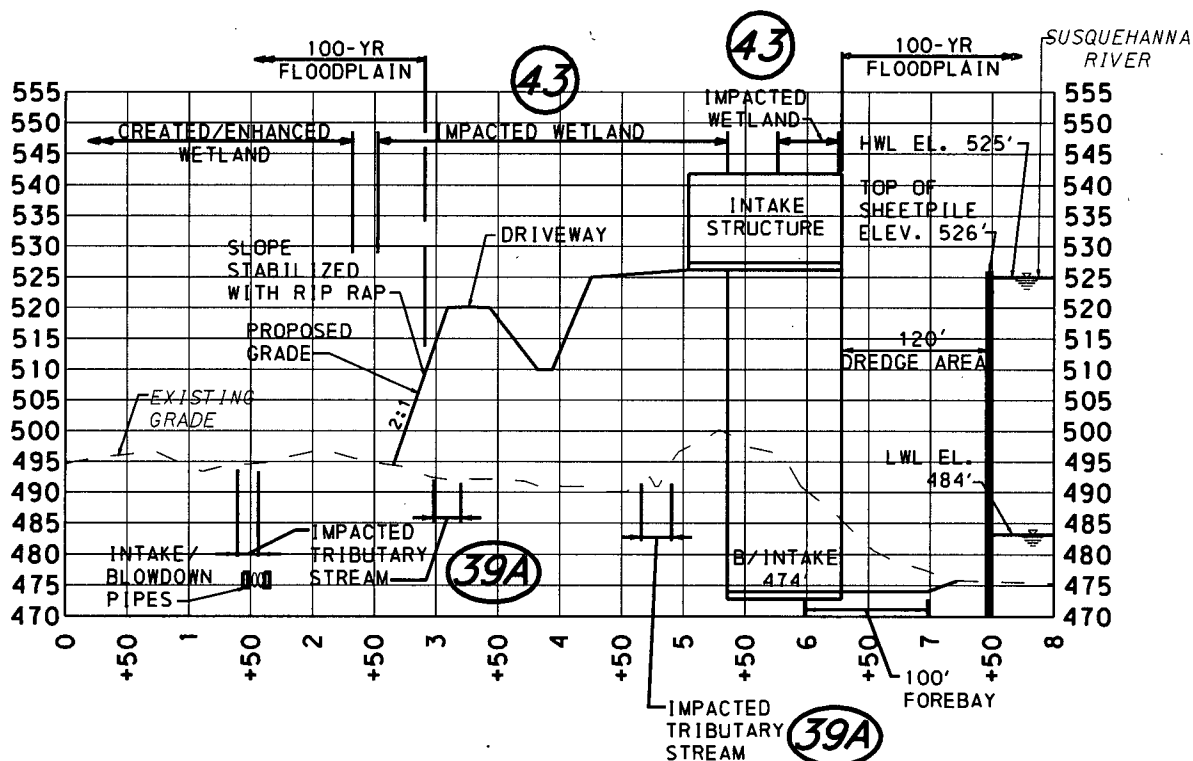
DATE:
04/08/2011

JPA PERMIT SUBMITTAL

BELL BEND NUCLEAR POWER PLANT
LUZERNE COUNTY, PENNSYLVANIA

APPLICATION BY:
PPL NUCLEAR DEVELOPMENT, LLC

FIGURE 8E - INTAKE STRUCTURE PLAN



NOTE: FLOOD ELEVATION FROM FEMA
FIRM MAP PANEL NUMBER
420625 0020 B IS 512.5.

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DRAWN BY: WCK

CHECKED BY: LGB

JOB No. PPLS 0902

HORZ. SCALE: 1"=150'
VERT. SCALE: 1"=30'

DATE:
04/08/2011

JPA PERMIT SUBMITTAL

BELL BEND NUCLEAR POWER PLANT
LUZERNE COUNTY, PENNSYLVANIA

APPLICATION BY:
PPL NUCLEAR DEVELOPMENT, LLC

FIGURE 8F - INTAKE STRUCTURE CROSS SECTION