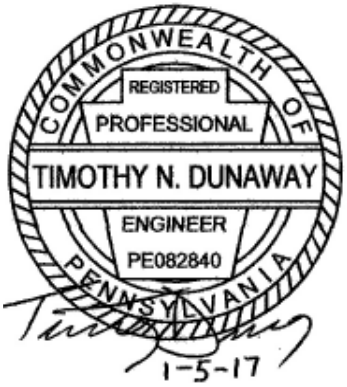
TETRA TECH

Hydrologic and Hydraulic Analysis

Floodplain Analysis Report for Chartiers Run and Westland Run Houston Injection Site Revision 2

Sunoco Logistics, L.P.

Chartiers Township, Washington County, Pennsylvania



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"I, Timothy Dunaway, do hereby certify to the best of my knowledge, information and belief, that the information contained in the accompanying plans, specifications, and reports has been prepared in accordance with accepted professional practice, is true and correct, and is in conformance with Chapter 106 of the rules and regulations of the Department of Environmental Protection."

"I, Timothy Dunaway, do hereby certify pursuant to the penalties of 18 Pa.C.S.A. Sec. 4904 to the best of my knowledge, information and belief, that the information contained in the accompanying plans, specifications and reports has been prepared in accordance with accepted engineering practice, is true and correct, and is in conformance with Chapter 105 of the rules and regulations of the Department of Environmental Protection."

2/1/17

Timothy Dunaway, P.E.
Professional Engineer No. PE082840

FLOODPLAIN ANALYSIS REPORT
CHARTIERS RUN AND WESTLAND RUN
HOUSTON INJECTION SITE

SUNOCO PIPELINE, L.P.
WASHINGTON COUNTY, PENNSYLVANIA

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1.0 PROJECT OVERVIEW

1.1 INTRODUCTION

Sunoco Pipeline, L.P. (Sunoco) has contracted Tetra Tech, Inc. (Tetra Tech) to conduct a floodplain study at the Houston Injection Site in Chartiers Township, Washington County, Pennsylvania (Project Site). Sunoco is proposing to install natural gas liquid facilities at the Houston Injection Site located at the confluence of Chartiers Run and Westland Run. The proposed facilities are located within a Federal Emergency Management Agency (FEMA) Zone A floodplain (no base flood elevations defined). In accordance with the Chartiers Township Floodplain Management Ordinance, the intent of this study is to determine base flood elevations at the proposed Project Site to quantify the effect of Sunoco's proposed development on the base flood elevations of Chartiers Run and Westland Run. According to the ordinance, Water Surface Elevations resulting from the proposed encroachment shall not cause an increase of more than one (1) foot in the 100-year Base Flood Elevation (BFE). Study reaches extend approximately 870 feet along Westland Run and 2,090 feet along Chartiers Run (past the confluence of these two streams). Upstream on Westland Run exists a bridge at the crossing of Ullom Road. A site location map is located in Appendix A.

Hydrologic and Hydraulic (H&H) calculations were completed to estimate and route the 100-year flood flow rate through Chartiers Run and Westland Run to the downstream confluence on Chartiers Run. Existing and proposed Project Site conditions were modeled. This revision includes revised final grading at the Project Site.

1.2 PROJECT DESCRIPTION

The purpose of the floodplain study on Chartiers Run and Westland Run (Project) is to quantify changes to the base flood elevation resulting from proposed grading as part of site development at the Houston Injection site. Hydraulic analysis for the Project was completed using the computer program Hydrologic Engineering Center River Analysis System (HEC-RAS), developed by the US Department of Defense, Army Corps of Engineers.

1.3 SITE INFORMATION

The Project is located in Chartiers Township, Washington County, Pennsylvania. The Project site is at the confluence of Chartiers Run and Westland Run as shown on Figure A-1. A detailed Flood Insurance Study (FIS), Number 422144, of Chartiers Run was completed downstream of the Project site; however, no detailed study was completed for either Westland Run or Chartiers Run upstream of the confluence. The Flood Insurance Rate Map (FIRM) Panel 4221440005, effective February 1, 1980, shows the 100-year floodplain for the Project site as a Zone A floodplain, having no published water surface elevations or defined floodway. Zone A floodplains were originally delineated by FEMA using non-numerically supported approximate study techniques. Therefore, the Project Site near the confluence of Chartiers Run and Westland Run has been identified by FEMA as an area of elevated risk of flooding but no detailed study has been adopted by FEMA. Because no defined floodway exists, an assumed floodway has been

incorporated into the proposed site designs, defined as 50-feet from top of bank in accordance with the Pennsylvania Department of Environmental Protection Chapter 105.1. Under Title 25, Chapter 93 of the PA Code and PA eMaps, these reaches of Chartiers Run and Westland Run are designated as warm water fishes (WWF). There are no USGS stream gaging stations along Westland Run or Chartiers Run.

2.0 DATA COLLECTION

HEC-2 (analytical software developed by the Hydrologic Engineering Center) data for FIS 422144 on Chartiers Run was obtained from FEMA in microfiche format. Pending data from FEMA in HEC-RAS format could not be furnished at the time of request (July 2015) because it was before the data release date of September 30, 2015. Upon release of updated FEMA data on September 30, 2015, it was confirmed that no new modeling for the subject area was conducted; therefore, the use of data from FIS 422144 for this H&H analysis is appropriate.

Tetra Tech conducted limited topographic survey of the study area on June 30, 2015, August 6, 2015, and August 7, 2015. Photographs were taken of the study area on September 24, 2015 (see Appendix A, A-2 Study Area Photographs). The primary intent of the field surveys was to collect stream channel information (top of bank to top of bank) for use in hydraulic modeling. The survey data was tied into a benchmark used in the Chartiers Township FEMA FIS 422144. All site information for this study was tied into vertical datum NGVD29 feet in order to be consistent with the Chartiers Township FEMA FIS 422144 information used as the downstream boundary condition.

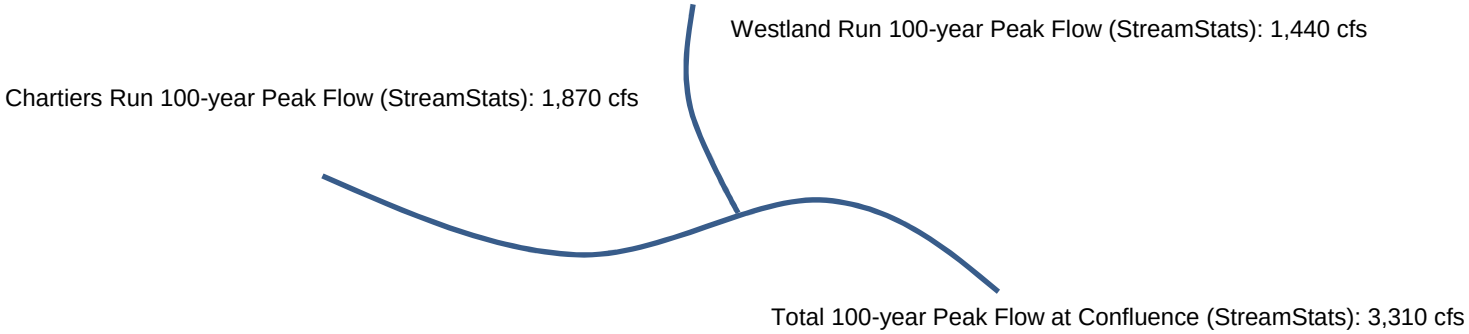
Additional information on existing site conditions outside of the stream channels was obtained from Pennsylvania Spatial Data Access (PASDA) Lidar PAMAP Program Topographic Contours (2 ft Interval) of Pennsylvania published June 15, 2007 through the PA Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey. Final proposed site conditions and grading plans were provided by Sunoco. The base maps for existing and proposed conditions with cross sections are shown in Figures A-3 and A-4, respectively (see Appendix A).

3.0 HYDROLOGY

The watershed is a steeply sloped basin that consists of wooded areas, open lands, and commercial and residential development. The total contributing drainage area is approximately 13.7 square miles at the confluence of Westland Run and Chartiers Run. A map showing the watershed is included in Appendix B as Figure B-1. Sub-watersheds for Westland Run and Chartiers Run upstream of their confluence are also included in Appendix B, Figures B-2 and B-3, respectively. The main channel slope of Chartiers Run within the study reach is 0.388%. The main channel slope of Westland Run within the study reach is 0.521%.

The 100-year peak stream discharge downstream of the confluence of Chartiers Run and Westland Run was obtained from FEMA FIS 422144 for Chartiers Township; however, peak stream discharge information for Chartiers Run upstream of the confluence and Westland Run was not provided in FIS 422144. Therefore, USGS Pennsylvania StreamStats, a web-based

geographic information systems application for use in water resources planning and management, was used to calculate peak runoff for Westland Run and Chartiers Run upstream of their confluence (see Appendix B, Reports B-4 and B-5, respectively). StreamStats uses the SIR 20008-5102 regression equations for estimating stream flow statistics. From these estimates, percent total flows were calculated for the upstream reaches. These percentages were applied to the downstream flow of 2,950 cfs obtained from FEMA FIS 422144 (see Table 1).



- Westland Run %Total: $\frac{1{,}440\ cfs}{3{,}310\ cfs} * 100 = 43.5\%$
- Chartiers Run % Total: $\frac{1{,}870\ cfs}{3{,}310\ cfs} * 100 = 56.5\ \%$

Table 1: Summary of Peak Discharge

Location	Drainage Area (square miles)	Peak Discharge (cfs) 100-year
Chartiers Run Downstream of Confluence with Westland Run (FEMA)	13.7	2,950
Chartiers Run Upstream of Confluence with Westland Run (Calculated)	8.08	56.5% of 2,950 = 1,667
Westland Run Upstream of Confluence with Chartiers Run (Calculated)	5.61	43.5% of 2,950 = 1,283

A copy of the effective FEMA FIRM Map can be found in Appendix B-6. FEMA FIS Report 122144 is included in Appendix B-7. A copy of the FEMA HEC-2 Microfiche is included in Appendix B-8.

4.0 EXISTING CONDITIONS HYDRAULICS

4.1 MODEL SETUP

Hydraulic analysis for both existing and proposed conditions was performed using U.S. Army Corps of Engineers HEC-RAS computer program. HEC-RAS calculates water surface profiles for flow in natural or man-made channels. HEC-RAS has the capacity to model various obstructions such as bridges, culverts, weirs, and other structures. The program computes a wide range of hydraulic variables for each peak discharge simulated including water surface elevation, velocity, and shear stress.

The hydraulic analysis was performed such that it included a sufficient amount of stream channel upstream and downstream from the work areas. As such, it incorporated an 870 lineal foot section of Westland Run and a 2,090 lineal foot section of Chartiers Run.

Stream cross sections were chosen approximately every 100 lineal feet and incorporate the entire width of the FEMA-defined Zone A 100-year floodplain. Cross-section geometry used in the model was based on field survey obtained in June and August 2015 and PASDA Lidar Topographic Contours (2 ft Interval). Upon comparison of Lidar and field survey in areas of dense tree cover, it was determined that Lidar data were significantly different due to the dense vegetation. Therefore, to connect survey data to Lidar in areas of dense tree cover, elevation data was interpolated using best engineering judgement from the last field survey point (top of bank) to a Lidar contour outside areas of dense vegetation.

The manning's "n" values estimated for this model are based on reference values published in the HEC-RAS Hydraulic Reference Manual. These values were published originally in Chow's book "Open-Channel Hydraulics" [Chow, 1959]. The manning's "n" value estimated for the streambed channel was 0.045 (clean, winding, some pools and shoals with some weeds and stones). This value is within the range of manning's "n" values (i.e., 0.040 to 0.055) used for the channel in FIS 422144. Manning's "n" values for the overbanks were specified as 0.1 (heavy stand of timber, few down trees, little undergrowth with flow below and into branches) or 0.035 (high grass) depending on the cover at each particular cross section, as observed through aerial imagery. The manning's "n" values used in FIS 422144 ranged from 0.060 to 0.150, corresponding to mostly wooded overbanks downstream of the confluence of Chartiers Run and Westland Run.

Hydrology within the HEC-RAS model was divided into three reaches: (1) Chartiers Run downstream of the confluence, (2) Chartiers Run upstream of the confluence, and (3) Westland Run upstream of the confluence. Flow changes at Reaches 1 through 3 were specified based on Table 1 Flows. Reaches 2 and 3 boundary conditions in both the existing and proposed models are set to normal depth upstream (i.e., slopes of 0.006588 and 0.001774, respectively) and "Junction" downstream. Reach 1 boundary conditions in both the existing and proposed models are set to "Junction" upstream and known water surface elevation downstream (i.e., specified water surface elevation as reported in the FEMA FIS 422144 for Chartiers Township).

Within an 870 foot study reach on Westland Run, there is one road crossing (Ullom Road) over the channel. The bridge is rectangular with concrete side walls. This crossing is included in the existing conditions HEC-RAS model, as summarized in Table 2.

Table 2: Summary of Existing Bridge Crossing Configuration

Crossing	Ullom Road Bridge
River Station	RS 292 (Westland Run)
Structure Type	Automobile bridge
Bridge Length (ft)	37
Hydraulic Width (ft)	16
Vertical Opening (ft)	5.4
Streambed Elevation (ft)	990.849
Vertical Distance from Streambed to Top of Road (ft)	7.566
Elevation of Low Chord (ft)	996.249
Top of Road (High Chord) Elevation (ft)	998.416
Upstream Embankment Side Slopes (ft/ft)	0.212
Downstream Embankment Side Slopes (ft/ft)	0.258

No other hydraulic structures, such as bridges, culverts or dams are located near the Project site that would impact the flow regime in this area.

The model was run under subcritical flow using a steady flow regime. No error messages were reported for either the existing or proposed models. The warnings and notes generated from the model included only warnings regarding the possible need for additional cross sections due to conveyance ratios outside the limits of tolerance, significant energy losses (greater than 1.0 foot), or velocity head changes greater than 0.5 foot. These warnings and notes can safely be ignored because cross sections were placed every 100 feet and hydraulic results are found to be reasonable.

In comparing model results to the FEMA FIS 422144, it can be seen that there is a slight discrepancy (i.e., 0.45 feet) between the water surface elevations at the cross section immediately downstream of the confluence (i.e., cross section O). This may be explained by the accuracy of the survey data at cross section O in this model versus the FEMA FIS 422144. As discussed in Section 2.0, cross sections used in the model were surveyed on June 30, 2015, August 6, 2015, and August 7, 2015. Additionally, cross-section O was the most upstream cross-section studied by the FEMA FIS 422144; therefore, the water surface elevation may have been influenced by the upstream boundary conditions set at cross section O.

4.2 EXISTING CONDITIONS RESULTS

Tables 3 and 4 summarize the results for existing conditions at each of the modeled cross sections for the 100-year flows in Westland Run and Chartiers Run, respectively. Existing site conditions are shown on Figure A-2 in Appendix A. Flood profiles and copy of the HEC-RAS summary output for existing conditions are included in Appendix C-1.

Table 3: Results of Existing Conditions Hydraulic Analysis Westland Run Reach 3

Reach[1]	Rvr Sta	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)	
3	700	1283.25	992.52	1000.53		1000.7	0.00131	4.22	697.37	224.94	0.27
3	600	1283.25	991.61	1000.45		1000.57	0.000988	3.94	857.74	243.11	0.25
3	500	1283.25	991.6	1000.27		1000.46	0.001148	4.38	659.34	178.02	0.27
3	400	1283.25	990.47	1000.24		1000.34	0.000716	3.47	842.09	189.61	0.2
3	300	1283.25	990.85	1000.14	996.31	1000.26	0.00091	3.8	889.46	286.54	0.23
3	292	Bridge									
3	275	1283.25	990.85	998.08		998.68	0.004864	7.36	396.85	193.61	0.5
3	200	1283.25	989.62	998.32		998.41	0.000736	3.13	814.1	293.02	0.2
3	100	1283.25	989.16	998.34		998.36	0.000132	1.37	1317.53	414.41	0.09
3	0	1283.25	988.87	998.34		998.35	0.000061	1.04	1737.25	483.82	0.06

1. Reach 1 = Chartiers Run downstream of confluence
   Reach 2 = Chartiers Run upstream of confluence
   Reach 3 = Westland Run

Table 4: Results of Existing Conditions Hydraulic Analysis Chartiers Run

Reach[1]	Rvr Sta	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)	
2	1300	1666.75	992.72	999.37	999.06	1001.43	0.018112	11.5	144.99	29.7	0.92
2	1200	1666.75	993.28	1000.09		1000.37	0.002428	5.36	498.27	181.25	0.38
2	1100	1666.75	990.76	999.94		1000.16	0.001608	4.42	492.87	184.87	0.3
2	1000	1666.75	992.61	999.33		999.88	0.0042	6.51	334.4	157.18	0.46
2	900	1666.75	991.03	999.22		999.49	0.002349	5.34	578.96	211.87	0.37
2	800	1666.75	990.97	999.06		999.27	0.001673	4.65	596.99	206.3	0.31
2	700	1666.75	990.34	998.64		999.05	0.002414	5.8	399.68	181.73	0.37
2	600	1666.75	990.85	998.81		998.87	0.000384	2.36	915.37	265.1	0.15
2	500	1666.75	989.8	998.69		998.81	0.000893	3.64	668.14	243.15	0.23
2	400	1666.75	990.57	998.46		998.68	0.001687	4.62	522.76	227.67	0.3
2	300	1666.75	990.15	998.32		998.52	0.001429	4.38	570.82	231.67	0.28
2	200	1666.75	989.49	998.34		998.4	0.000491	2.73	968.38	344.95	0.17
2	100	1666.75	989.94	998.31		998.35	0.000327	2.27	1122.16	362.46	0.14
2	0	1666.75	989.88	998.31		998.33	0.000101	1.34	1779.48	492.52	0.08
1	690	2950	988.97	997.55		998.22	0.004459	8.31	709.33	156.5	0.52
1	0	2950	985.7	996.7	992.88	996.87	0.000916	4.25	1395.77	252.74	0.25

1. Reach 1 = Chartiers Run downstream of confluence
   Reach 2 = Chartiers Run upstream of confluence
   Reach 3 = Westland Run

5.0 PROPOSED CONDITIONS HYDRAULICS

Sunoco's proposed site development requires grading. Six (6) cross sections were modified to reflect the final proposed grade and consider elevation differences within the 100-year floodplain at the Project Site. These sections include Reach 2 River Station 400, 300, 200, 100, 000 and Reach 3 River Station 000.

5.1 MODEL SETUP

The purpose of the proposed grading at the Project site is to create a level pad for placing equipment. Proposed conditions were incorporated by editing the cross section geometry for each of the modification scenarios.

5.2 PROPOSED CONDITIONS RESULTS

Tables 5 and 6 summarizes the results for final proposed conditions at each of the modeled cross sections for the 100-year flows in Westland Run and Chartiers Run, respectively. In comparing the existing and proposed conditions (Tables 3 through 6), the proposed cut and fill balance such that the largest proposed water surface elevation increase along Chartiers Run and Westland Run is 0.00 feet for the 100-year storm event (see Table 7). Therefore, the proposed grading will not raise the BFE. The proposed grading is consistent with the Chartiers Township ordinance.

Proposed conditions are shown in Figure A-3 in Appendix A. Figure A-3 shows the existing and proposed BFE as modeled by HEC-RAS. It should be noted that both the existing and proposed BFEs modeled through HEC-RAS are located inside the FEMA Zone A (approximate) floodplain boundary. Flood profiles and copy of the HEC-RAS summary output for proposed conditions are included in Appendix C-2.

Table 5: Results of Final Proposed Conditions Hydraulic Analysis Westland Run

Reach[1]	Rvr Sta	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)	
3	700	1283.25	992.52	1000.53		1000.7	0.00131	4.22	697.37	224.94	0.27
3	600	1283.25	991.61	1000.45		1000.57	0.000988	3.94	857.74	243.11	0.25
3	500	1283.25	991.6	1000.27		1000.46	0.001148	4.38	659.34	178.02	0.27
3	400	1283.25	990.47	1000.24		1000.34	0.000716	3.47	842.09	189.61	0.2
3	300	1283.25	990.85	1000.14	996.31	1000.26	0.00091	3.8	889.46	286.54	0.23
3	292	Bridge									
3	275	1283.25	990.85	998.07		998.68	0.004896	7.38	395.42	193.34	0.5
3	200	1283.25	989.62	998.32		998.4	0.00074	3.13	812.46	292.69	0.2
3	100	1283.25	989.16	998.34		998.36	0.000133	1.38	1315.21	414.15	0.09
3	0	1283.25	988.87	998.34		998.35	0.000056	0.99	1787.19	483.7	0.06

1. Reach 1 = Chartiers Run downstream of confluence
   Reach 2 = Chartiers Run upstream of confluence
   Reach 3 = Westland Run

Table 6: Results of Proposed Conditions Hydraulic Analysis Chartiers Run

Reach[1]	Rvr Sta	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)	
2	1300	1666.75	992.72	999.36	999.06	1001.42	0.01831	11.54	144.43	29.67	0.92
2	1200	1666.75	993.28	1000.07		1000.36	0.002465	5.39	495.08	180.51	0.38
2	1100	1666.75	990.76	999.92		1000.14	0.001636	4.45	489.03	183.7	0.3
2	1000	1666.75	992.61	999.27		999.85	0.004414	6.63	326.19	153.87	0.48
2	900	1666.75	991.03	999.16		999.44	0.002489	5.47	565.94	209.39	0.38
2	800	1666.75	990.97	998.99		999.21	0.001783	4.77	582.09	203.04	0.32
2	700	1666.75	990.34	998.51		998.97	0.002726	6.09	375.67	173.43	0.39
2	600	1666.75	990.85	998.7		998.76	0.00042	2.44	886.43	261.72	0.16
2	500	1666.75	989.8	998.56		998.69	0.001	3.82	638.16	236.56	0.24
2	400	1666.75	990.57	998.42		998.58	0.001308	4.05	585.73	240.51	0.27
2	300	1666.75	990.15	998.32		998.46	0.001016	3.69	658.3	247.24	0.24
2	200	1666.75	989.49	998.31		998.37	0.000431	2.56	952	290.08	0.16
2	100	1666.75	989.94	998.31		998.34	0.00016	1.59	1384.4	361.5	0.1
2	0	1666.75	989.88	998.31		998.32	0.000079	1.18	1912.91	492.41	0.07
1	690	2950	988.97	997.55		998.22	0.004457	8.31	709.36	156.49	0.52
1	0	2950	985.7	996.7	992.88	996.87	0.000916	4.25	1395.77	252.74	0.25

1. Reach 1 = Chartiers Run downstream of confluence
   Reach 2 = Chartiers Run upstream of confluence
   Reach 3 = Westland Run

Table 7: Comparison of Existing and Proposed Conditions

Reach[1]	Rvr Sta	W.S. Elev (Existing)	Vel Chnl (Existing)	W.S. Elev (Proposed)	Vel Chnl (Proposed)	W.S. Elevation Difference	Vel Chnl Difference
		(ft)	(ft/s)	(ft)	(ft/s)		
3	700	1000.53	4.22	1000.53	4.22	0	0
3	600	1000.45	3.94	1000.45	3.94	0	0
3	500	1000.27	4.38	1000.27	4.38	0	0
3	400	1000.24	3.47	1000.24	3.47	0	0
3	300	1000.14	3.8	1000.14	3.8	0	0
3	292	Bridge					
3	275	998.08	7.36	998.07	7.38	-0.010	0.02
3	200	998.32	3.13	998.32	3.13	0.000	0
3	100	998.34	1.37	998.34	1.38	0.000	0.01
3	0	998.34	1.04	998.34	0.99	0.000	-0.05
2	1300	999.37	11.5	999.36	11.54	-0.010	0.04
2	1200	1000.09	5.36	1000.07	5.39	-0.020	0.03
2	1100	999.94	4.42	999.92	4.45	-0.020	0.03
2	1000	999.33	6.51	999.27	6.63	-0.060	0.12
2	900	999.22	5.34	999.16	5.47	-0.060	0.13
2	800	999.06	4.65	998.99	4.77	-0.070	0.12
2	700	998.64	5.8	998.51	6.09	-0.130	0.29
2	600	998.81	2.36	998.7	2.44	-0.110	0.08
2	500	998.69	3.64	998.56	3.82	-0.130	0.18
2	400	998.46	4.62	998.42	4.05	-0.040	-0.57
2	300	998.32	4.38	998.32	3.69	0.000	-0.69
2	200	998.34	2.73	998.31	2.56	-0.030	-0.17
2	100	998.31	2.27	998.31	1.59	0.000	-0.68
2	0	998.31	1.34	998.31	1.18	0.000	-0.16
1	690	997.55	8.31	997.55	8.31	0.000	0
1	0	996.7	4.25	996.7	4.25	0.000	0

1. Reach 1 = Chartiers Run downstream of confluence
   Reach 2 = Chartiers Run upstream of confluence
   Reach 3 = Westland Run

6.0 RISK ASSESSMENT

The proposed grading at the Houston Injection Project Site will yield no increases (a maximum of 0.000 feet) in water surface elevations on Chartiers Run and Westland Run for the 100-year storm event. Additionally, all equipment and piping components are located above the flood plain, with the exception of the pipe support foundations and cable tray foundations. The associated calculated floodplain limits are contained within the boundary of the 100-year floodplain limits on the published FEMA FIRM Map (February 1, 1980).

There is a maximum increase in stream velocity of 0.02 ft/s along Westland Run and 0.29 ft/s along Chartiers Run. The increase in proposed velocity is minimal and will not result in accelerated erosion and sedimentation.

Therefore, the project will not result in a threat to property or hazard of life as outlined within this report.

7.0 CONCLUSIONS

A detailed floodplain analysis of the proposed grading at the Houston Injection Project site was performed for Westland Run and Chartiers Run. Study Reaches 2 and 3 are not part of a detailed FEMA Flood Insurance Study and are designated as a Zone A (approximate) floodplain, defined by FEMA as areas within the 100-year floodplain but do not have 100-year water surface elevations or a delineated floodway. The results of the H&H analysis indicate that the proposed grading will not cause an increase in the 100-year water surface elevations relative to the existing conditions within the study reaches for the 100-year peak flow rate of 2,950 cfs. No significant on-site or off-site increases in flood velocities are anticipated to occur. The proposed pipe support foundations and cable tray foundations within the BFE will be firmly anchored to resist flotation, collapse, and lateral movement. The proposed equipment and structures outside of the BFE but within the FEMA Zone A (approximate) floodplain will be flood proofed. Therefore, the proposed grading will not increase the risk of flooding within the limits of this study for the 100-year storm event along Westland Run and Chartiers Run.

REFERENCES

1. Brunner, Gary W. *HEC-RAS River Analysis System: User's Manual*. Davis, CA: US Army Corps of Engineers, Institute for Water Resources, Hydrologic Engineering Center, 2002. USACE, Jan. 2010. Web.
2. Chow, V.T., 1959, Open Channel Hydraulics, McGraw-Hill Book Company, NY.
3. EMapPA. Pennsylvania Department of Environmental Protection <http://www.depgis.state.pa.us/emappa/>.
4. Federal Emergency Management Agency *HEC-2 Release Chartiers Township, Washington County*. June 1978. PDF of Microfiche Data.
5. Federal Emergency Management Agency *HEC-2, Water Surface Profiles*. Ft. Belvoir: Defense Technical Information Center, 1988. USACE, Sept. 1990.
6. Federal Emergency Management Agency, February 1, 1980, Flood Insurance Study, Washington County, Pennsylvania.
7. Federal Emergency Management Agency, Pennsylvania Department of Environmental Protection, 2006, PA Code Title 25, Chapter 93, Water Quality Standards.
8. Pennsylvania Department of Environmental Protection, 2006, PA Code Title 25, Chapter 106.
9. U.S. Army Corps of Engineers, January 2010, HEC-RAS River Analysis System, Version 4.1.0, Hydrologic Engineering Center, Davis, CA.
10. U.S. Army Corps of Engineers, January 2010, HEC-RAS River Analysis System Hydraulic Reference Manual, Version 4.1, Hydrologic Engineering Center, Davis, CA.

APPENDIX A

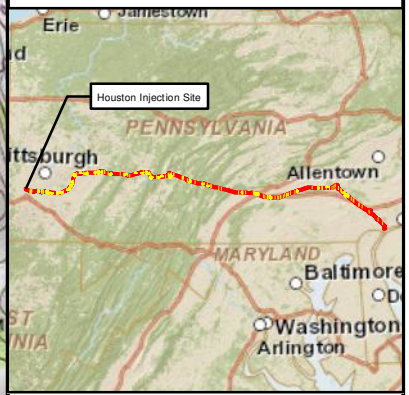
Site Information
A-1 – Project Location Map
A-2 – Study Area Photographs
A-3 – Existing Conditions
A-4 – Proposed Conditions

A-1 PROJECT LOCATION MAP

Legend

Houston Injection Site

Sheet Identifier



N

Feet
0 1,000 2,000

Meters
0 304.8 609.6

FIGURE A-1
USGS PROJECT LOCATION MAP
PENNSYLVANIA PIPELINE PROJECT
HOUSTON INJECTION SITE
SUNOCO LOGISTICS, L.P.
WASHINGTON COUNTY, PA

TETRA TECH

Notes:
1) Topographic map provided by ESRI's ArcGIS Online USA Topo Maps map service (© 2013 National Geographic Society, i-cubed).
2) Quadrangles displayed are Canonsburg, Midway, Washington East, and Washington West.

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PENNPIPELINE_HOUSTONINJECTIONSTATION_USGS.MXD 10/01/15 GIS

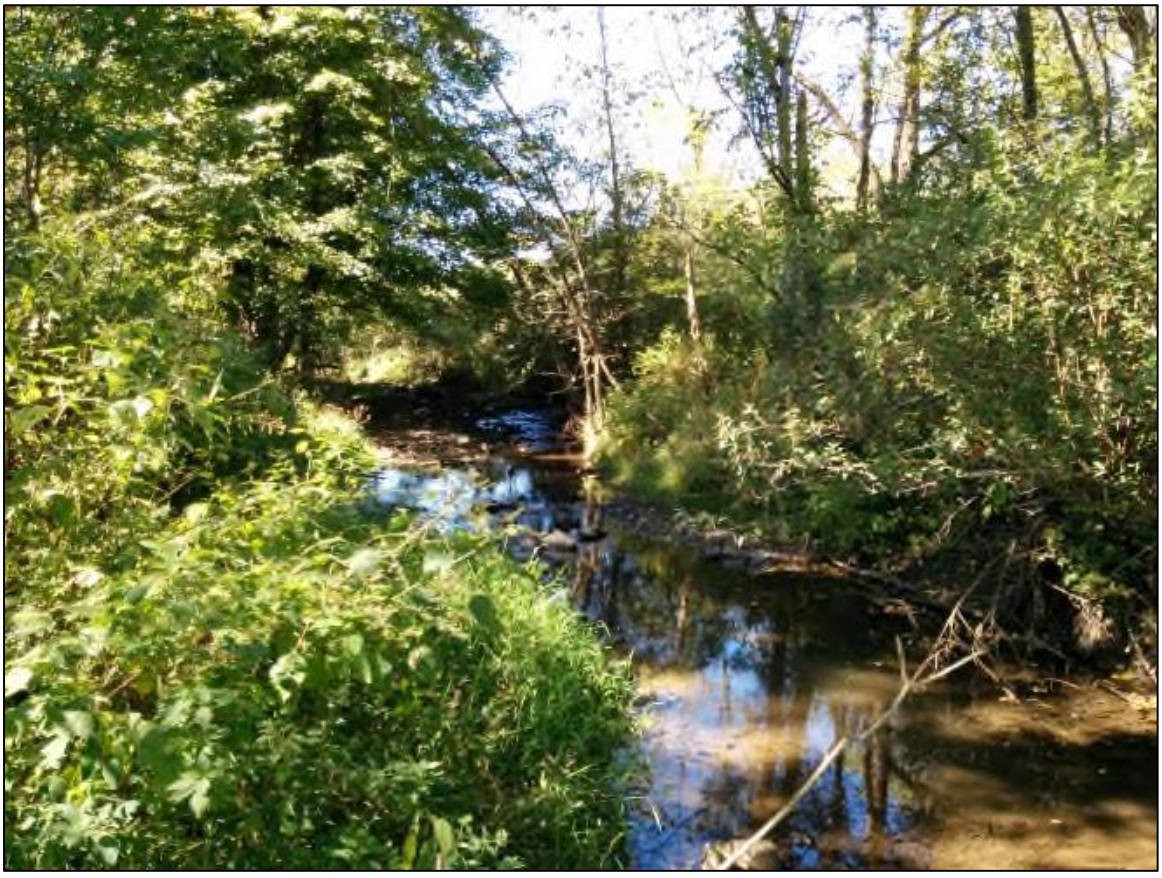
A-2 STUDY AREA PHOTOGRAPHS

Ullom Road Bridge over Westland Run Facing Northeast

Ullom Road Bridge Looking Upstream on Westland Run

Ullom Road Bridge Looking Downstream on Westland Run

Underside of Ullom Road Bridge



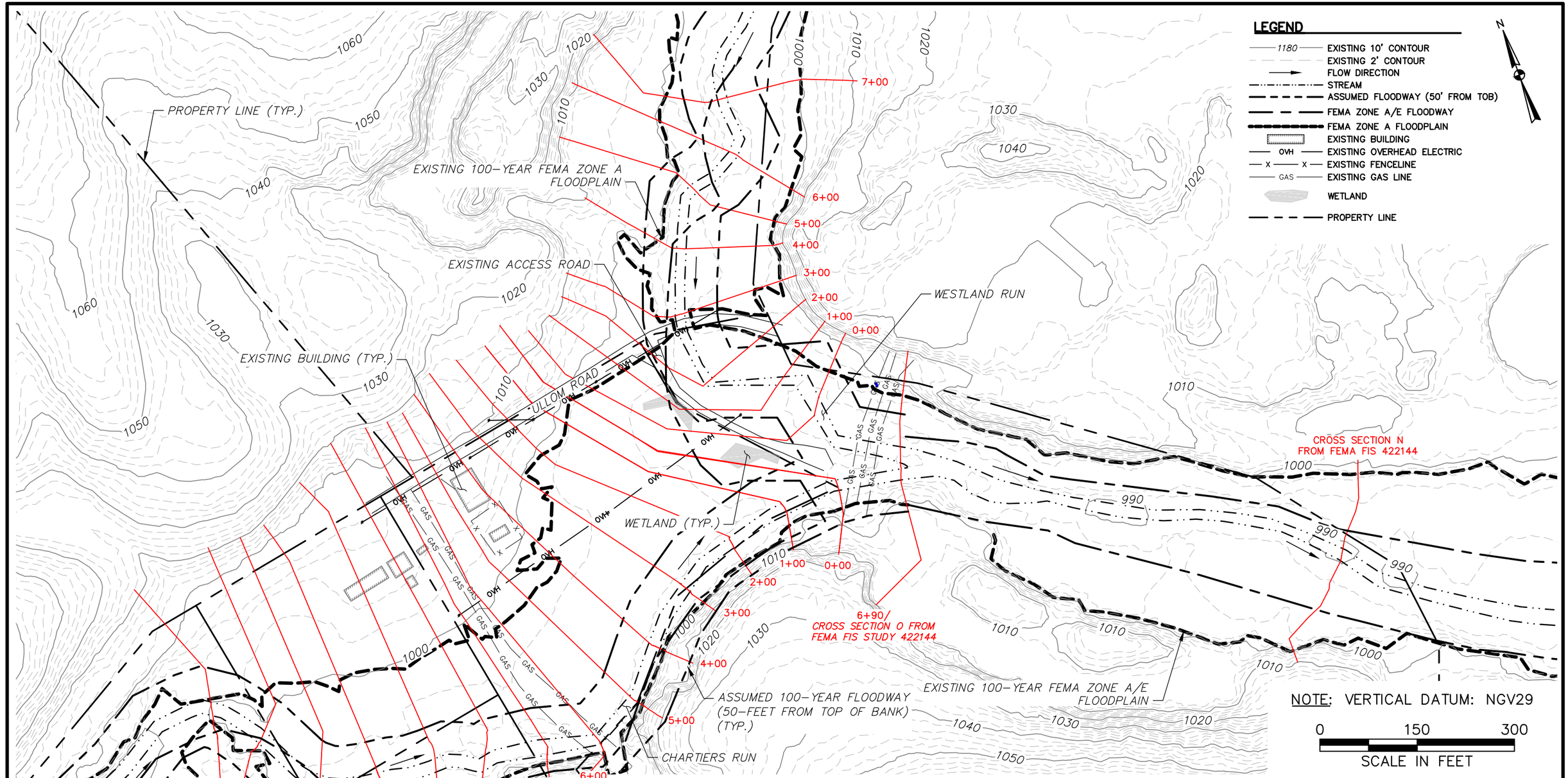
Chartiers Run Looking Upstream from Confluence with Westland Run

Chartiers Run (Downstream Right) Looking South from Confluence with Westland Run

Westland Run Looking Upstream from Confluence with Chartiers Run

Chartiers Run (Downstream Left) Looking Southeast from Confluence with Westland Run

A-3 EXISTING CONDITIONS



NOTE: VERTICAL DATUM: NGV29

0 150 300

SCALE IN FEET

TETRA TECH
WWW.TETRATECH.COM
661 ANDERSEN DRIVE – FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

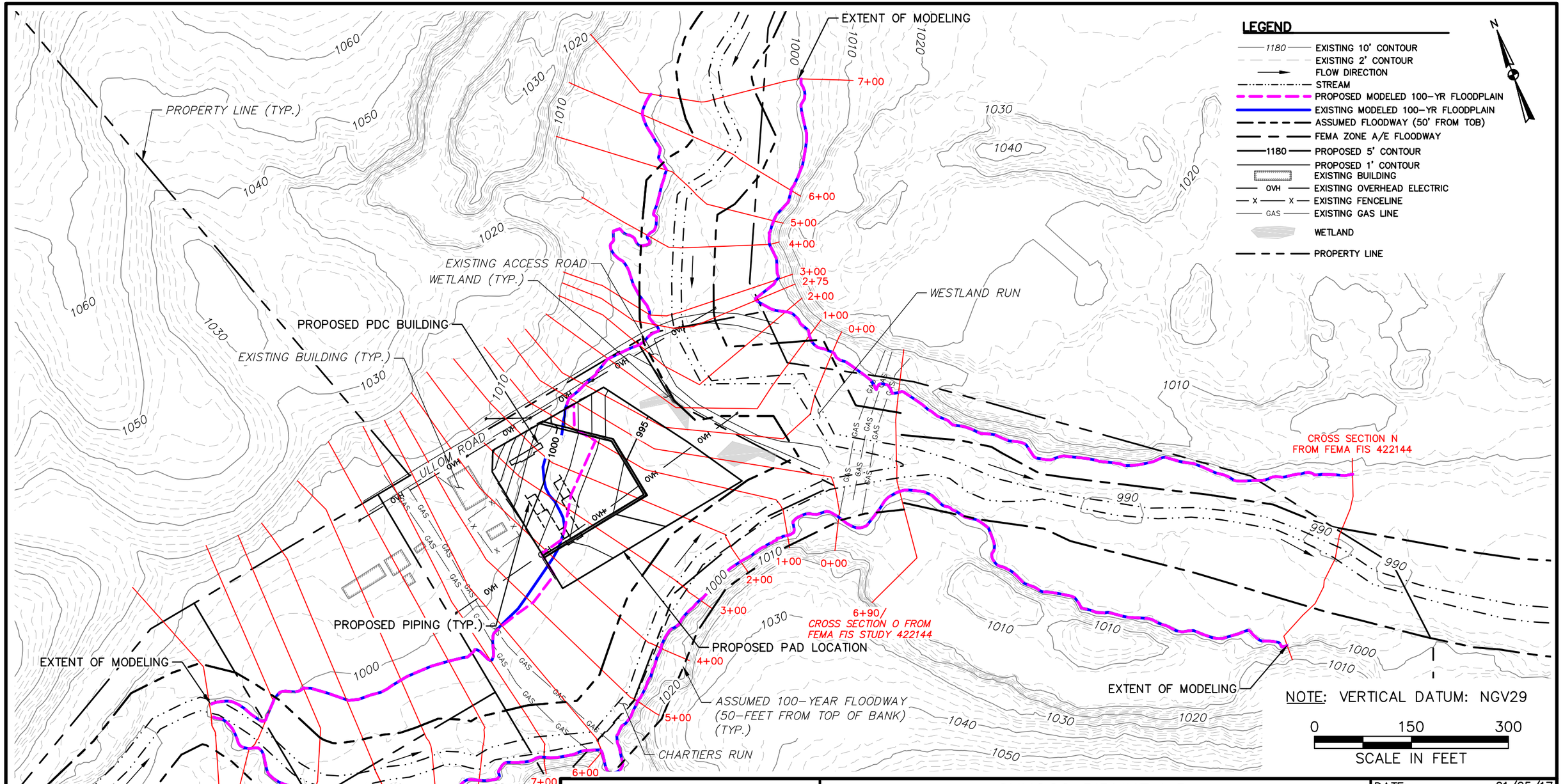
SUNOCO PIPLINE L.P.
SINKING SPRING, PENNSYLVANIA

HOUSTON HST7 INJECTION SITE
EXISTING CONDITIONS PLAN

DATE:	10/14/15
PROJECT NO.:	112IC05958
DESIGNED BY:	MS
DRAWN BY:	BH
CHECKED BY:	TD
SHEET:	1 OF 2

FIGURE A-3

A-4 PROPOSED CONDITIONS



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SUNOCO PIPLINE L.P.
SINKING SPRING, PENNSYLVANIA

HOUSTON HST7 INJECTION SITE
PROPOSED CONDITIONS PLAN

DATE:	01/25/17
PROJECT NO.:	112IC05958
DESIGNED BY:	MS
DRAWN BY:	BH
CHECKED BY:	TD
SHEET:	2 OF 2

FIGURE 2

R:_Marcellus Shale Projects\Sunoco\5370 – Houston HST7 Injection\Figures\Floodplain Figure – Proposed.dwg PIT JOY.SCABILLONI 1/25/2017 1:32:09 PM

APPENDIX B

Hydrologic Analysis Documentation
B-1 – Chartiers Run Downstream StreamStats Drainage Area Map
B-2 – Westland Run Upstream StreamStats Drainage Area Map
B-3 – Chartiers Run Upstream StreamStats Drainage Area Map
B-4 – Westland Run Upstream StreamStats Ungaged Report
B-5 – Chartiers Run Upstream StreamStats Ungaged Report
B-6 – FEMA Effective FIRM Map
B-7 – FEMA Effective FIS Report
B-8 – FEMA HEC-2 MICROFICHE DATA

B-1 CHARTIERS RUN DOWNSTREAM STREAMSTATS DRAINAGE AREA MAP

StreamStats Version 3 Beta

Zoom To:

Select on a tool on the toolbar. If the icon remains depressed, click on the map to perform the desired action.

PA Map Layers

- Streamgages
- Stream Grid
- Area of limited functionality
- Pennsylvania
- Study Area Bndys

Base Layers

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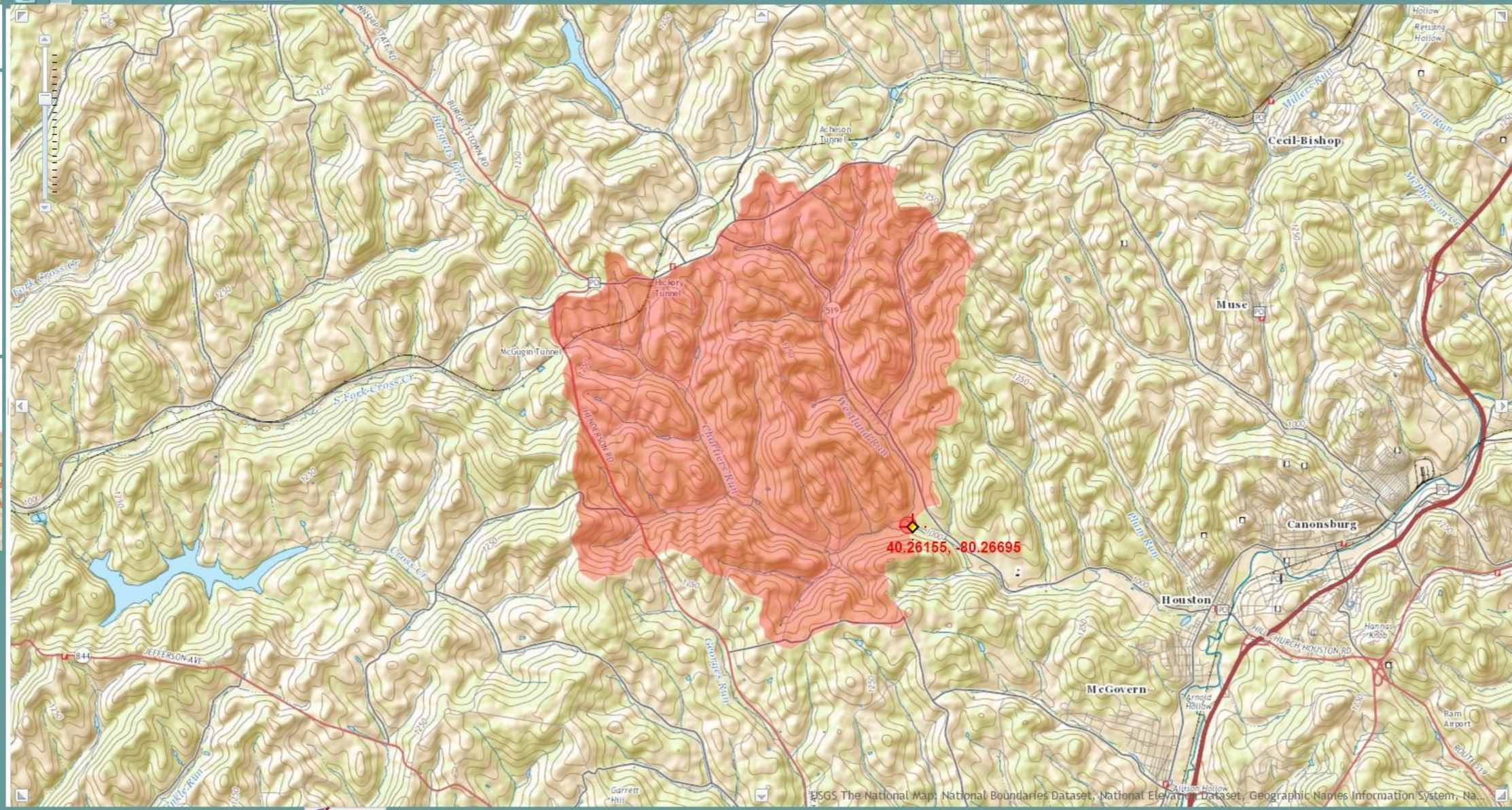
Scale: 1 : 72,224
Latitude: 40.32082
Longitude: -80.34367 SS



B-1 CHARTIERS RUN DOWNSTREAM STREAMSTATS DRAINAGE AREA MAP

B-2 WESTLAND RUN UPSTREAM STREAMSTATS DRAINAGE AREA MAP

StreamStats Version 3 Beta

Zoom To:

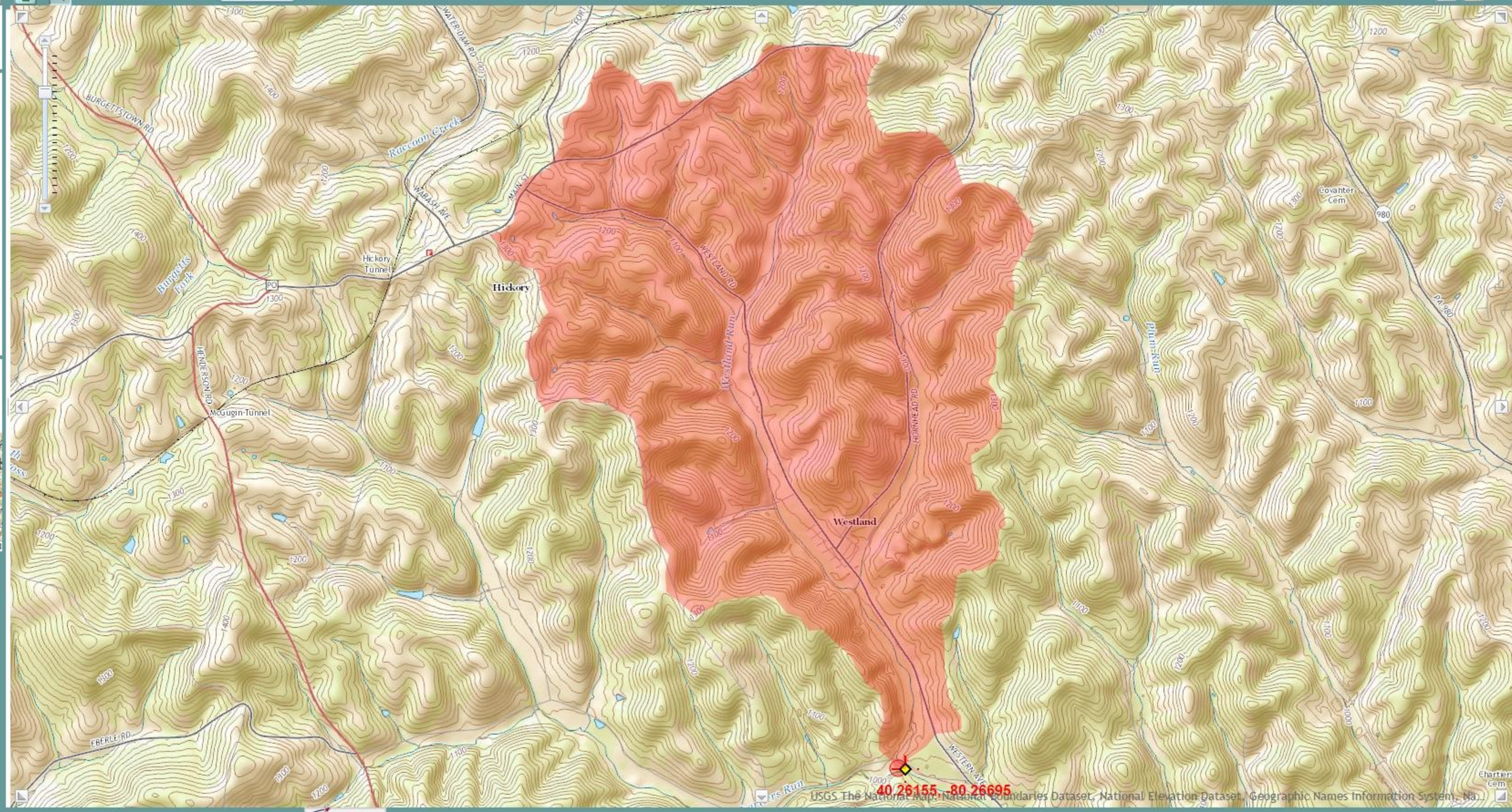
Select on a tool on the toolbar. If the icon remains depressed, click on the map to perform the desired action.

PA Map Layers

- Streamgages
- Stream Grid
- Area of limited functionality
- Pennsylvania
- Study Area Bndys

Base Layers

0 0.2 0.4mi
Scale: 1 : 36,112
Latitude: 40.30800
Longitude: -80.30441 SS



Accessibility FOIA Privacy Policies and Notices

USA.gov

U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstatsags.cr.usgs.gov/v3_beta/viewer.htm
Page Contact Information: StreamStats Help
Page Last Modified: 8/4/2015 (Web1)

Streamstats Status News Introduction Application Information

B-2 WESTLAND RUN UPSTREAM STREAMSTATS DRAINAGE AREA MAP

B-3 CHARTIERS RUN UPSTREAM STREAMSTATS DRAINAGE AREA MAP

StreamStats Version 3 Beta

Zoom To:

Select on a tool on the toolbar. If the icon remains depressed, click on the map to perform the desired action.

PA Map Layers

- Streamgages
- Stream Grid
- Area of limited functionality
- Pennsylvania
- Study Area Bndys

Base Layers

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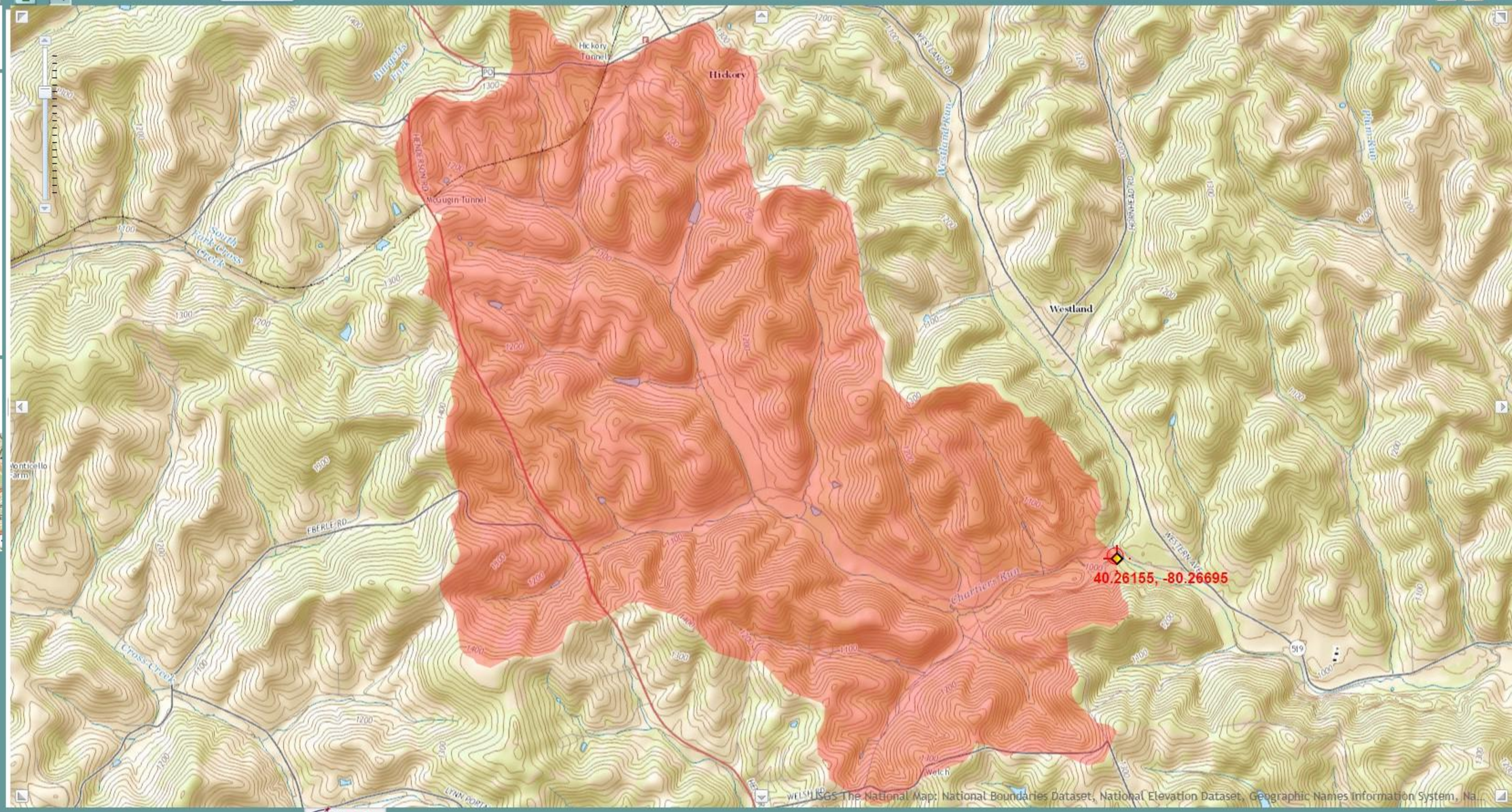


B-3 CHARTIERS RUN UPSTREAM STREAMSTATS DRAINAGE AREA MAP

B-4 WESTLAND RUN UPSTREAM STREAMSTATS UNGAGED REPORT

Flow Statistics Ungaged Site Report Westland Run

Date: Mon Aug 10, 2015 4:31:18 PM GMT-4
Site Location: Pennsylvania
NAD 1983 Latitude: 40.2615 (40 15 42)
NAD 1983 Longitude: -80.2662 (-80 15 59)
Drainage Area: 5.61 mi2

Low Flow Basin Characteristics

100% Low Flow Region 4 (5.61 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	5.61	2.26	1400
Mean Basin Elevation (feet)	1182.2	1050	2580

Mean/Base-flow Basin Characteristics

100% Statewide Mean and Base Flow (5.61 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	5.61	2.26	1720
Mean Basin Elevation (feet)	1182.2	130	2700
Mean Annual Precipitation (inches)	39.0	33.1	50.4
Percent Carbonate (percent)	0.0	0	99
Percent Forest (percent)	51.0	5.1	100
Percent Urban (percent)	4.0	0	89

Peak Flow Basin Characteristics

100% Peak Flow Region 3 (5.61 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	5.61	1.44	1610
Mean Basin Elevation (feet)	1182.2	457	2150
Percent Carbonate (percent)	0.0	0	99
Percent Urban (percent)	4.0	0	64
Percent Storage (percent)	0.0	0	22.6

Low Flow Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	0.2	ft3/s	43			
M30D2Y	0.35	ft3/s	38			
M7D10Y	0.0683	ft3/s	66			
M30D10Y	0.13	ft3/s	54			
M90D10Y	0.24	ft3/s	41			

http://pubs.usgs.gov/sir/2006/5130/ (http://pubs.usgs.gov/sir/2006/5130/)
Stuckey_ M.H._ 2006_ Low-flow_ base-flow_ and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130_ 84 p.

Mean/Base-flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	7.07	ft3/s	12			
QAH	1.17	ft3/s	38			
BF10YR	2.29	ft3/s	21			
BF25YR	1.99	ft3/s	21			
BF50YR	1.82	ft3/s	23			

http://pubs.usgs.gov/sir/2006/5130/ (http://pubs.usgs.gov/sir/2006/5130/)
Stuckey_ M.H._ 2006_ Low-flow_ base-flow_ and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130_ 84 p.

Peak Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	318	ft3/s	31	3		
PK5	549	ft3/s	28	5		
PK10	733	ft3/s	28	7		
PK50	1210	ft3/s	31	11		
PK100	1440	ft3/s	36	11		
PK500	2060	ft3/s	43	11		

http://pubs.usgs.gov/sir/2008/5102/ (http://pubs.usgs.gov/sir/2008/5102/)
Roland_ M.A._ and Stuckey_ M.H._ 2008_ Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102_ 57p.

B-5 CHARTIERS RUN UPSTREAM STREAMSTATS UNGAGED REPORT

Flow Statistics Ungaged Site Report Chartiers Run

Date: Mon Aug 10, 2015 4:27:39 PM GMT-4
Site Location: Pennsylvania
NAD 1983 Latitude: 40.2613 (40 15 41)
NAD 1983 Longitude: -80.2667 (-80 16 00)
Drainage Area: 8.08 mi2

Low Flow Basin Characteristics

100% Low Flow Region 4 (8.08 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	8.08	2.26	1400
Mean Basin Elevation (feet)	1198.0	1050	2580

Mean/Base-flow Basin Characteristics

100% Statewide Mean and Base Flow (8.08 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	8.08	2.26	1720
Mean Basin Elevation (feet)	1198.0	130	2700
Mean Annual Precipitation (inches)	39.0	33.1	50.4
Percent Carbonate (percent)	0.0	0	99
Percent Forest (percent)	50.0	5.1	100
Percent Urban (percent)	3.0	0	89

Peak Flow Basin Characteristics

100% Peak Flow Region 3 (8.08 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	8.08	1.44	1610
Mean Basin Elevation (feet)	1198.0	457	2150
Percent Carbonate (percent)	0.0	0	99
Percent Urban (percent)	3.0	0	64
Percent Storage (percent)	0.0	0	22.6

Low Flow Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	0.3	ft3/s	43			
M30D2Y	0.53	ft3/s	38			
M7D10Y	0.11	ft3/s	66			
M30D10Y	0.2	ft3/s	54			
M90D10Y	0.36	ft3/s	41			

http://pubs.usgs.gov/sir/2006/5130/ (http://pubs.usgs.gov/sir/2006/5130/)
Stuckey_ M.H._ 2006_ Low-flow_ base-flow_ and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130_ 84 p.

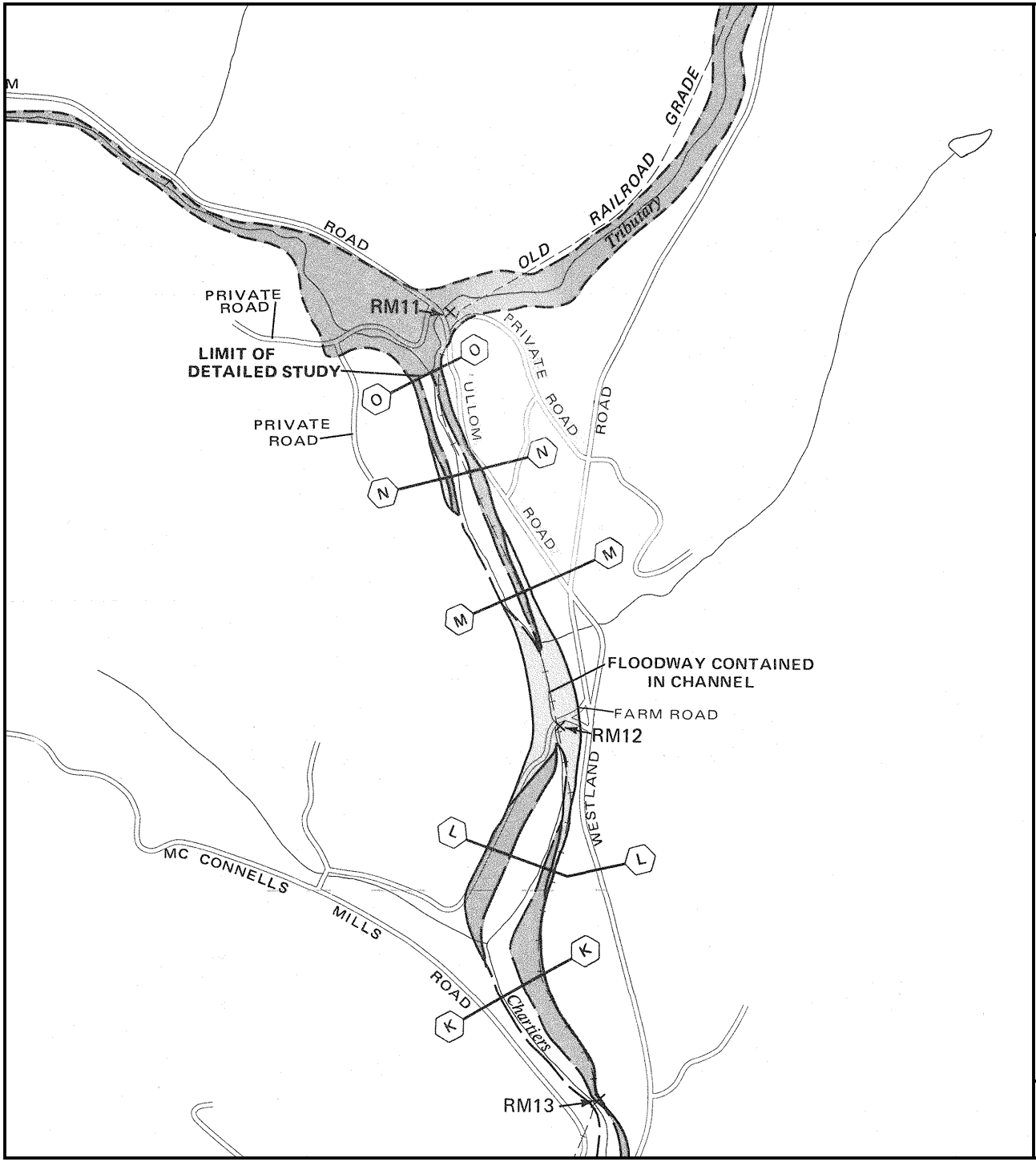
Mean/Base-flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	10.2	ft3/s	12			
QAH	1.69	ft3/s	38			
BF10YR	3.25	ft3/s	21			
BF25YR	2.82	ft3/s	21			
BF50YR	2.59	ft3/s	23			

http://pubs.usgs.gov/sir/2006/5130/ (http://pubs.usgs.gov/sir/2006/5130/)
Stuckey_ M.H._ 2006_ Low-flow_ base-flow_ and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130_ 84 p.

Peak Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	426	ft3/s	31	3		
PK5	728	ft3/s	28	5		
PK10	967	ft3/s	28	7		
PK50	1580	ft3/s	31	11		
PK100	1870	ft3/s	36	11		
PK500	2670	ft3/s	43	11		

http://pubs.usgs.gov/sir/2008/5102/ (http://pubs.usgs.gov/sir/2008/5102/)
Roland_ M.A._ and Stuckey_ M.H._ 2008_ Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102_ 57p.

B-6 FEMA EFFECTIVE FIRM MAP



APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY

FLOOD BOUNDARY AND FLOODWAY MAP

TOWNSHIP OF
CHARTIERS,
PENNSYLVANIA
WASHINGTON COUNTY

PANEL 5 OF 10
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
422144 0005

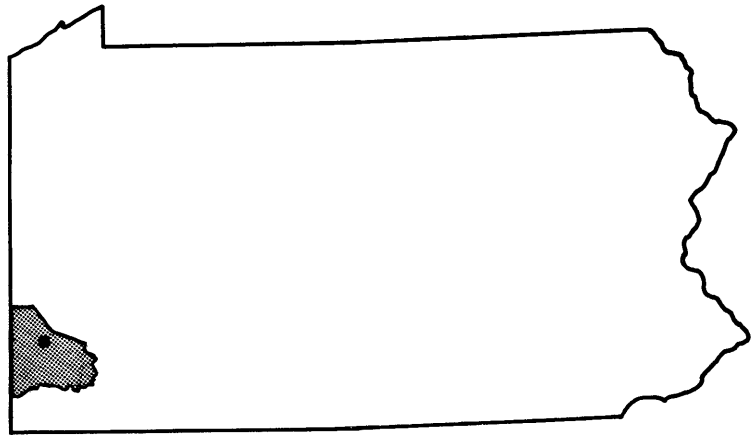
EFFECTIVE DATE:
FEBRUARY 1, 1980

U.S. DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

B-7 FEMA EFFECTIVE FIS REPORT

FLOOD INSURANCE STUDY

TOWNSHIP OF CHARTIERS, PENNSYLVANIA
WASHINGTON COUNTY



AUGUST 1979

FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL INSURANCE ADMINISTRATION
COMMUNITY NUMBER - 422144

TABLE OF CONTENTS

TABLE OF CONTENTS - continued

FLOOD INSURANCE STUDY
TOWNSHIP OF CHARTIERS, PENNSYLVANIA

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the Township of Chartiers, Washington County, Pennsylvania, and to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert Chartiers to the regular program of flood insurance by the Federal Insurance Administration (FIA). Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain development.

1.2 Coordination

In June 1977, the initial Consultation and Coordination Officer's (CCO) meeting was held to determine the areas to be studied by detailed and approximate methods, and to gather information on the township's history, physical lay-out, and flooding records. In attendance were representatives of the Township of Chartiers, the FIA, and the study contractor, Michael Baker, Jr., Inc. Gannett, Fleming, Corddry, and Carpenter, Inc., provided a list of source data it used to prepare the Flood Hazard Boundary Map for Chartiers. A search was made on all levels of government for sources of information relating to flooding in the community's vicinity. Hydrologic and hydraulic data on Chartiers Creek were received from the Pittsburgh District of the U. S. Army Corps of Engineers.

On March 6, 1979, a final CCO meeting was held to present the results of the study to the township. Attending the meeting were community officials and representatives of FIA and the study contractor.

1.3 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were prepared by Michael Baker, Jr., Inc., for the Federal Insurance Administration, under Contract No. H-4553. This work, which was completed in September 1978, covered all significant flooding sources in the Township of Chartiers.

2.0 AREA STUDIED

2.1 Scope of Study

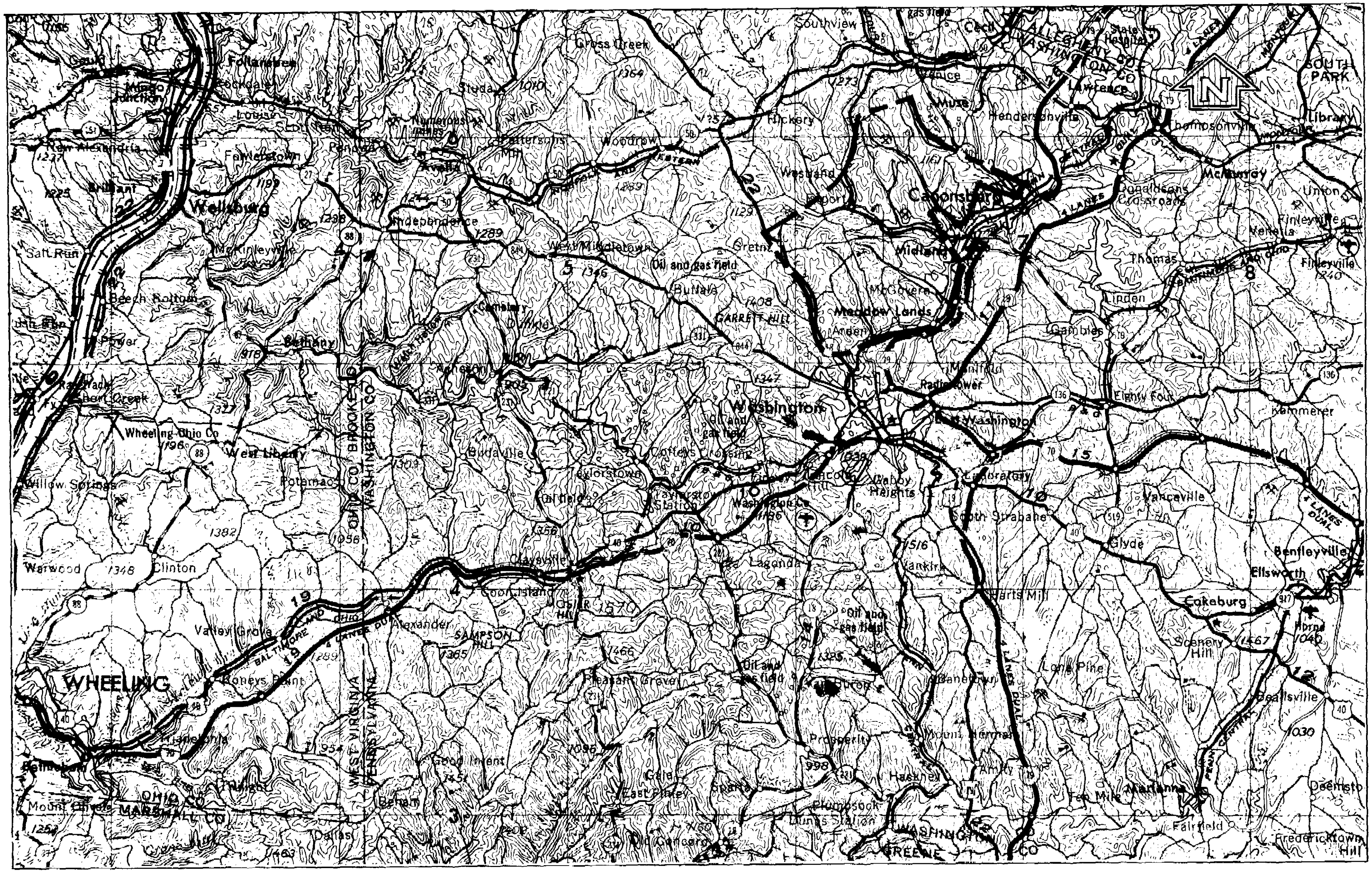
This Flood Insurance Study covers the incorporated area of the Township of Chartiers, Washington County, Pennsylvania. The area of study is shown on the Vicinity Map (Figure 1).

Chartiers Creek was studied in detail for the length of its course through the township, a distance of about 6.2 miles. Brush Run was studied by detailed methods from the township's corporate limits upstream a distance of 0.8 mile. Chartiers Run was studied in detail from its mouth upstream for 3.7 miles, excluding its 0.3-mile reach through the Borough of Houston. Georges Run was studied in detail from the township limits upstream a distance of 3.8 miles. The areas studied by detailed methods were selected with priority given to all known flood hazard areas, areas of projected development, and areas of proposed construction for the next five years, through September 1983.

The following streams were studied by approximate methods: Plum Run, from the township's corporate limits upstream a distance of 3.7 miles; Brush Run, from the limit of the detailed study upstream a distance of 3.6 miles; Chartiers Run, from the limit of the detailed study upstream to the corporate limits, a distance of 1.4 miles; Georges Run, from the limit of the detailed study upstream to the corporate limits, a total distance of 1.3 miles. Nine tributaries to Chartiers Run and Chartiers Creek, henceforth designated as Tributaries 1 through 9, were also studied by approximate methods. Approximate methods of analysis were used to study those areas having low development potential and minimal flood hazards as identified at the initiation of the study. The scope and methods of study were proposed to and agreed upon by the FIA.

2.2 Community Description

The Township of Chartiers is located in southwestern Pennsylvania, in north-central Washington County, about 1 mile north of the City of Washington and about 14 miles southwest of the City of Pittsburgh. The township is bordered on the north by the Township of Cecil, on the east by the Borough of Canonsburg, the Borough of Houston, and the Township of North Strabane, on the south by the Township of South Strabane and the Township of Canton, and on the west by the Township of Mount Pleasant.



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA

(WASHINGTON CO.)

APPROXIMATE SCALE

1 0 1 2 3 MILES

VICINITY MAP

Development in the Township of Chartiers is a mix of residential, commercial, and industrial structures. Building in the flood plains of the tributaries to Chartiers Creek is mostly residential, while in the flood plain of Chartiers Creek itself, development is mixed.

The Township of Chartiers, originally part of the Township of Cecil, was established by a Washington County Court action on March 23, 1970. Early industries in the area consisted of farming, lumbering, and coal mining. Today, while farming and mining are still important activities, new industries in Chartiers produce a variety of items including electrical, soap, and steel products (Reference 1). The township's population grew only slightly from 7,225 in 1960 to 7,324 in 1970.

The township has a temperate climate, with an average annual rainfall of 37 inches. It is located in the Kanawha section of the unglaciated Allegheny Plateau. The area is characterized by narrow stream valleys and hills with elevations ranging from about 930 to 1,410 feet. Soils on the hilltops are primarily composed of stoney, clayey soils about 10 feet in thickness. Hillsides are exposed or have thinly overlain rock, while the valleys are comprised of an alluvial mixture of clays, organic matter and a little gravel from the harder rock strata. This soil is fairly impervious and is conducive to a low rate of infiltration and high runoff, especially during rain storms.

Vegetation in the Brush Run, Chartiers Run and Georges Run watersheds consists of lawns, trees, and shrubbery in the residential areas, and trees, brush, and weeds in the undeveloped areas. Vegetation in the Chartiers Creek watershed consists of wooded and agricultural lands which surround the residential and industrial areas in the main valleys.

Chartiers Creek has a drainage area of 76.6 square miles at the downstream corporate limits of the township. It is located along the southeast corporate limits of the township and flows in a northeasterly direction, with an average channel slope of 7 feet per mile. Brush Run has a drainage area of 5.8 square miles at the downstream corporate limits of the township. It is located along the northeast corporate limits of the township and flows in a southeasterly direction, with an average channel slope of about 40 feet per mile. Chartiers Run has a drainage area of 22.1 square miles at its mouth. It is located in the central part of the township and flows in a southeasterly direction, with an average channel slope of 10 feet per mile. Georges Run has a drainage area of 7.2 square

miles at the downstream corporate limits of the township. It is located along the southwest corporate limits of the township and flows in a southeasterly direction, with an average channel slope of 25 feet per mile.

2.3 Principal Flood Problems

The streams in Chartiers flow in somewhat narrow valleys with steep side slopes, which during rainstorms are conducive to rapid runoff, causing streams to rise rapidly with high velocities. Flood damages and elevations can increase because of ice and floating debris, such as trees, logs and brush, which restrict the flow of water through the channel, culverts, and bridges. Although not a significant factor, snowmelt can cause flooding during sudden winter thaws, or in early spring.

Chartiers Creek and its tributaries have a history of flooding from the 1800s. The largest flood in the history of the township occurred in September 1912. Other floods occurred in August 1956, April 1961, March 1963, and February 1966 (Reference 2). The estimated frequencies of these floods are as follows: the flood of 1912 was slightly less than a 50-year flood; the flood of 1956 was about a 20-year flood; the flood of 1961 was less than a 10-year flood; the floods of 1963 and 1966 were slightly larger than a 10-year flood.

The flood of September 1912, was the result of severe thunderstorms which dropped about 6 inches of rain. Small streams became torrents, destroying many businesses and houses. Many bridges were damaged, if not washed away.

The following list shows elevations of five historical floods, measured at the Main Street bridge in the Borough of Houston:

Historical Flood	Elevation
September 1912	951.0
August 1956	949.4
April 1961	946.6
March 1963	948.5
February 1966	948.9

2.4 Flood Protection Measures

A U. S. Army Corps of Engineers (COE) flood protection project is proposed for a reach of Chartiers Creek in the Township of Chartiers

adjoining the Borough of Houston. This project, Unit 2B, consists of deepening, widening and re-aligning the channel of Chartiers Creek (Reference 3). Since the completion date is unknown, this analysis does not consider the effects of the channelization project, and flood profiles and maps have been prepared for present conditions. There are no existing flood protection measures in the Township of Chartiers at this time.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Floods having recurrence intervals of 10, 50, 100, and 500 years have been selected as having special significance for flood plain management and for flood insurance premium rates. The analyses reported here reflect current conditions in the watersheds of the flooding sources.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail in the community.

Peak discharge-frequency relationships for Chartiers Creek, Brush Run, Chartiers Run, and Georges Run were developed by correlating data from five gages in the Chartiers Creek watershed with those from similar watersheds. The relationships were then analyzed by the log-Pearson Type III method (Reference 4).

The gages (all in Pennsylvania) were: No. 855 on Chartiers Creek at Carnegie; No. 861 on Big Sewickley Creek at Ambridge; No. 11115 on Brush Run at Buffalo; No. 498 on Little Pine Creek at Etna; and No. 830 on Green Lick Run at Green Lick Reservoir.

Several ungaged streams studied by detailed methods in the Chartiers Creek watershed were analyzed by a multiple regression method developed by the COE, whereby equations are developed by analyzing twelve different gage records for watersheds of less than 25 square miles, each having more than 25 years of record. The gages are located in eastern Ohio, northern West Virginia, and western Pennsylvania (Reference 5). Flows for the streams in the Chartiers Creek watershed developed from the COE multiple regression method were compared to the drainage area versus discharge relationship and were found to agree.

A summary of drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CHARTIERS CREEK					
At downstream corporate limits	77.5	5,600	10,100	12,600	19,400
Above confluence with Chartiers Run	54.5	4,400	7,800	9,450	14,500
GEORGES RUN					
At the downstream corporate limits	7.2	950	1,620	1,960	2,890
1.9 miles above mouth	3.1	580	990	1,200	1,750
BRUSH RUN					
At downstream corporate limits	6.0	830	1,430	1,750	2,580
CHARTIERS RUN					
At its mouth	22.1	1,920	3,400	4,200	6,300
Above confluence with Plum Run	18.0	1,640	2,890	3,510	5,250
Above confluence of unnamed tributary 0.4 mile above McConnells Mills	14.3	1,380	2,400	2,950	4,400

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding sources studied in detail in the community were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of these flooding sources.

Water-surface profiles for Chartiers Creek, Brush Run, Chartiers Run, and Georges Run were computed through the use of the COE HEC-2 step-backwater computer program (Reference 6).

Cross-section data for these flooding sources were obtained by conventional field surveys. All bridges were surveyed to obtain

structural geometry and elevation data. Roughness coefficients (Manning's "n") for Chartiers Creek, Brush Run, Chartiers Run, and Georges Run were assigned on the basis of field investigation and comparison with similar streams (Reference 7). The roughness coefficients for Chartiers Creek were 0.04 for the channel and 0.1 for the overbanks. For Brush Run, they were 0.055 for the channel and 0.1 for the overbanks; for Chartiers Run, the channel and overbank coefficients ranged from 0.04 to 0.055 and 0.1 to 0.15, respectively; and for Georges Run they ranged from 0.045 to 0.05 and 0.08 to 0.1, respectively.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross-section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 3).

All elevations used in this study are referenced to the National Geodetic Vertical Datum of 1929 (NGVD), formerly referred to as Sea Level Datum of 1929. Locations of the elevation reference marks used in the study are shown on the maps.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are valid only if the hydraulic structures remain unobstructed and do not fail.

For streams studied by approximate methods, the extent of flooding was determined by field investigation, use of standard 7.5-minute U. S. Geological Survey (USGS) topographic maps enlarged to a scale of 1"=1,000' with a contour interval of 20 feet (Reference 8), and by accepted engineering principles.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage state and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100- and the 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps enlarged to a scale of 1"=1,000', with a contour interval of 20 feet (Reference 8). In cases where the 100- and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

The flood boundaries of approximate-study streams were delineated using field investigation, engineering judgement, and standard USGS topographical maps (Reference 8).

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 3). Small areas within the flood boundaries may lie above the flood elevations and, therefore, may not be subject to flooding. Owing to limitations of the map scale and lack of detailed topographic data, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood can be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

Portions of the floodway widths on Chartiers Creek, Brush Run, and Georges Run lie outside the corporate limits of the Township of Chartiers.

As shown on the Flood Boundary and Floodway Map (Exhibit 3), the floodway widths were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and flood insurance zone designations for each flooding source affecting the Township of Chartiers.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Chartiers Creek								
A	32,206	448/206[2]	4,892	1.9	953.8	953.8	954.6	0.8
B	33,736	464/431[2]	4,781	2.0	954.4	954.4	955.3	0.9
C	35,567	105	1,449	6.5	958.1	958.1	959.0	0.9
D	38,126	201/48 [2]	2,186	4.3	964.8	964.8	965.3	0.5
E	39,096	251/195[2]	2,557	3.7	965.4	965.4	966.2	0.8
F	41,145	103	1,702	5.6	968.7	968.7	969.3	0.6
G	42,680	301/183[2]	3,418	2.8	970.2	970.2	970.9	0.7
H	44,030	105/76 [2]	1,299	7.3	970.8	970.8	971.7	0.9
I	46,593	235/132[2]	2,825	3.0	976.3	976.3	977.1	0.8
J	48,208	145/145[2]	1,988	4.3	977.2	977.2	978.0	0.8
K	49,268	489/489[2]	3,977	2.1	977.8	977.8	978.6	0.8
L	51,976	92	1,212	7.0	980.6	980.6	981.1	0.5
M	53,126	372/337[2]	3,250	2.6	982.4	982.4	983.0	0.6
N	55,584	637/591[2]	4,880	1.7	985.1	985.1	986.0	0.9
O	56,999	635/319[2]	4,100	2.1	985.6	985.6	986.6	1.0
P	57,599	290/267[2]	2,168	3.9	986.1	986.1	987.1	1.0
Q	58,679	207/177[2]	1,887	4.5	988.1	988.1	988.8	0.7
R	60,975	495/471[2]	3,582	1.9	990.8	990.8	991.7	0.9
S	62,298	106/50 [2]	1,035	6.5	993.5	993.5	994.4	0.9

[1]Feet above confluence with Little Chartiers Creek
[2]Width/width within corporate limits

TABLE 2

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

FLOODWAY DATA

CHARTIERS CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH [3] (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Chartiers Creek (continued)								
T	63,254[1]	84/35	758	8.8	994.5	994.5	994.8	0.3
U	63,954[1]	71/30	962	7.0	996.1	996.1	996.1	0.0
Georges Run								
A	2,980[2]	77/65	443	4.4	1004.8	1004.8	1005.8	1.0
B	3,960[2]	107/94	584	3.4	1007.4	1007.4	1008.1	0.7
C	5,015[2]	51/39	278	7.0	1010.2	1010.2	1011.1	0.9
D	5,870[2]	72/37	460	4.3	1013.4	1013.4	1014.1	0.7
E	6,800[2]	93/49	432	4.5	1015.3	1015.3	1016.2	0.9
F	8,870[2]	92/32	564	3.5	1024.2	1024.2	1025.1	0.9
G	11,475[2]	79/49	364	3.3	1033.7	1033.7	1034.3	0.6
H	13,205[2]	65/14	254	4.7	1042.1	1042.1	1042.2	0.1
I	14,295[2]	71/10	331	3.6	1047.2	1047.2	1048.1	0.9
J	15,065[2]	68/57	260	4.6	1051.5	1051.5	1052.1	0.6
K	16,375[2]	66/51	246	4.9	1059.4	1059.4	1060.1	0.7
L	17,635[2]	63/27	263	4.6	1067.5	1067.5	1068.0	0.5
M	20,915[2]	56/41	253	4.7	1092.1	1092.1	1093.0	0.9

[1] Feet above confluence with Little Chartiers Creek
[2] Feet above mouth
[3] Width/width within corporate limits

TABLE 2

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

FLOODWAY DATA

CHARTIERS CREEK AND GEORGES RUN

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Brush Run								
A	3,491	94/17[2]	471	3.7	944.1	944.1	944.9	0.8
B	5,588	116/102[2]	469	3.7	956.9	956.9	957.6	0.7
C	6,276	33/25[2]	225	7.8	964.2	964.2	965.0	0.8
Chartiers Run								
A	2,535	422	3,200	1.1	954.7	954.7	955.5	0.8
B	3,295	335	2,189	1.6	954.9	954.9	955.8	0.9
C	4,970	102	900	3.9	958.7	958.7	959.6	0.9
D	5,865	145	1,147	3.1	960.6	960.6	961.3	0.7
E	7,415	101	723	4.9	964.4	964.4	964.8	0.4
F	8,715	214	1,611	2.2	967.4	967.4	968.1	0.7
G	9,620	235	1,533	2.3	968.6	968.6	969.5	0.9
H	10,965	151	1,189	3.0	972.1	972.1	972.7	0.6
I	12,035	260	1,666	2.1	974.0	974.0	974.8	0.8
J	13,025	184	1,247	2.8	976.5	976.5	977.4	0.9
K	16,090	168	1,071	3.3	986.8	986.8	987.5	0.7
L	17,090	255	1,628	1.8	988.8	988.8	989.7	0.9
M	18,925	103	853	3.5	994.9	994.9	995.6	0.7
N	19,820	136	973	3.0	996.7	996.7	997.6	0.9
O	20,510	111	1,000	2.9	998.0	998.0	999.0	1.0

[1] Feet above mouth
[2] Width/width within corporate limits

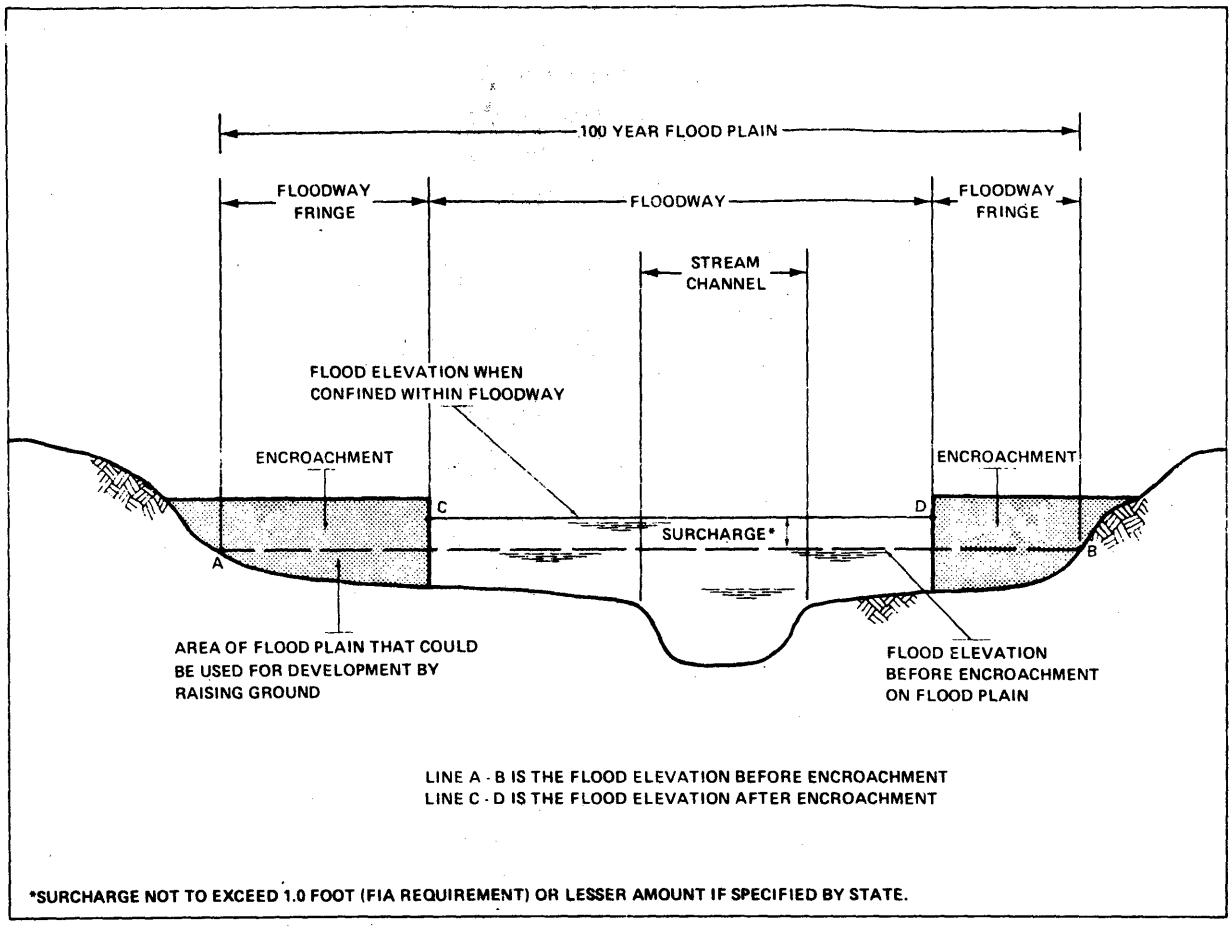
TABLE 2

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

FLOODWAY DATA

BRUSH RUN AND CHARTIERS RUN



FLOODWAY SCHEMATIC Figure 2

The locations of reaches determined for the flooding sources of the Township of Chartiers are shown on the Flood Profiles (Exhibit 1) and are summarized in the Flood Insurance Zone Data Table (Table 3).

5.2 Flood Hazard Factors

The FHF is the FIA device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Chartiers Creek							
Reach 1	05, 10	-5.2	-1.7	+4.3	050	A10	Varies
Reach 2	05	-4.2	-1.0	+2.4	040	A8	Varies
Georges Run							
Reach 1	05	-1.5	-0.4	+1.0	015	A3	Varies
Brush Run							
Reach 1	10	-2.3	-0.7	+1.8	025	A5	Varies
Chartiers Run							
Reach 1	05	-3.5	-0.8	+2.3	035	A7	Varies
Reach 2	05	-2.8	-0.8	+2.0	030	A6	Varies

[1]Flood Insurance Rate Map Panel
[2]Weighted average
[3]Rounded to the nearest foot - see map

TABLE 3

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

FLOOD INSURANCE ZONE DATA

CHARTIERS CREEK, GEORGES RUN, BRUSH RUN AND CHARTIERS RUN

feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of the Township of Chartiers was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zones A3, A5, A6, A7, A8, A10:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHF.
Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Township of Chartiers is, for insurance purposes, the principal result of the Flood Insurance

Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

The FIA is currently preparing studies for the Township of Cecil, the Borough of Canonsburg, the Borough of Houston, and the Townships of North and South Strabane, all of which are in the immediate vicinity of the Township of Chartiers (References 9, 10, 11, 12, and 13). The results of these studies, when completed, should be in exact agreement with the conclusions of this study. As of the date of this study, no other reports on flooding in Chartiers were found to exist.

This study is authoritative for purposes of the Flood Insurance Program, and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the Office of the Federal Insurance Administration, Regional Director, Region III, Curtis Building, Sixth and Walnut Streets, Philadelphia, Pennsylvania 19106.

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REACH 1
ZONE A10

CORPORATE LIMITS

CONRAIL

JOHNSON ROAD

CONRAIL

CONRAIL

ELEVATION IN FEET (NGVD)

980
970
960
950
940
930

31 32 33 34 35 36 37 38 39 40 41 42 43 44

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH LITTLE CHARTIERS CREEK

A B C D E F G

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

CHARTIERS CREEK

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

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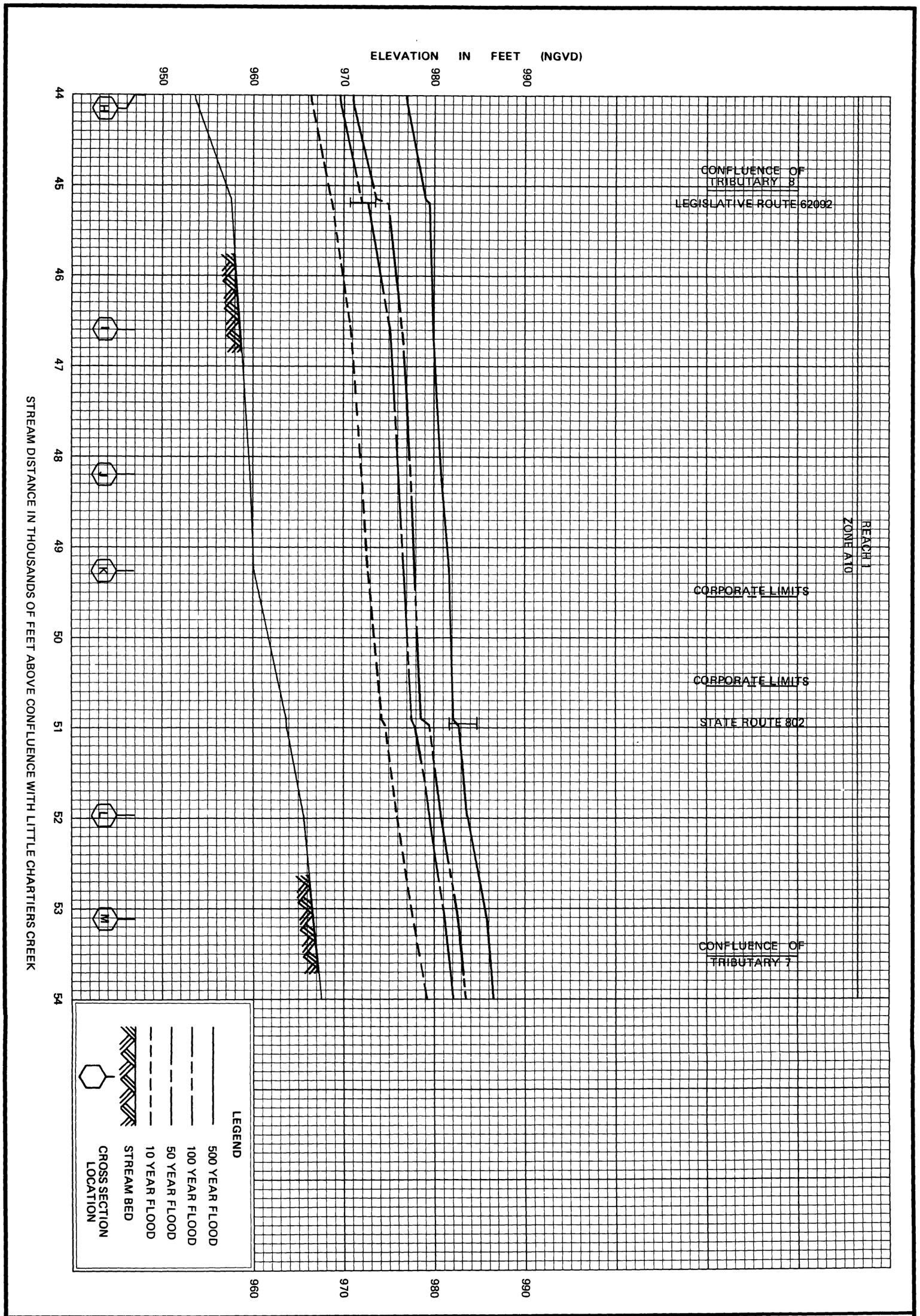

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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

FLOOD PROFILES

CHARTIERS CREEK

REACH 1
ZONE A10

REACH 2
ZONE A8

COUNTRY CLUB ROAD

CONFLUENCE OF TRIBUTARY 5

CONRAIL

LEGISLATIVE ROUTE 6218

DIRT ROAD

CORPORATE LIMITS

ELEVATION IN FEET (NGVD)

1000
990
980
970
960

1000
990
980
970

N O P Q R S T U

54 55 56 57 58 59 60 61 62 63 64 65

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH LITTLE CHARTIERS CREEK

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

CHARTIERS CREEK

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

03P

REACH 1
ZONE A3

CORPORATE LIMITS

DRIVEWAY

DRIVEWAY

FARM ROAD

ELEVATION IN FEET (NGVD)

1060
1050
1040
1030
1020
1010
1000
990

A B C D E F G H I

2 3 4 5 6 7 8 9 10 11 12 13 14 15

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE MOUTH

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

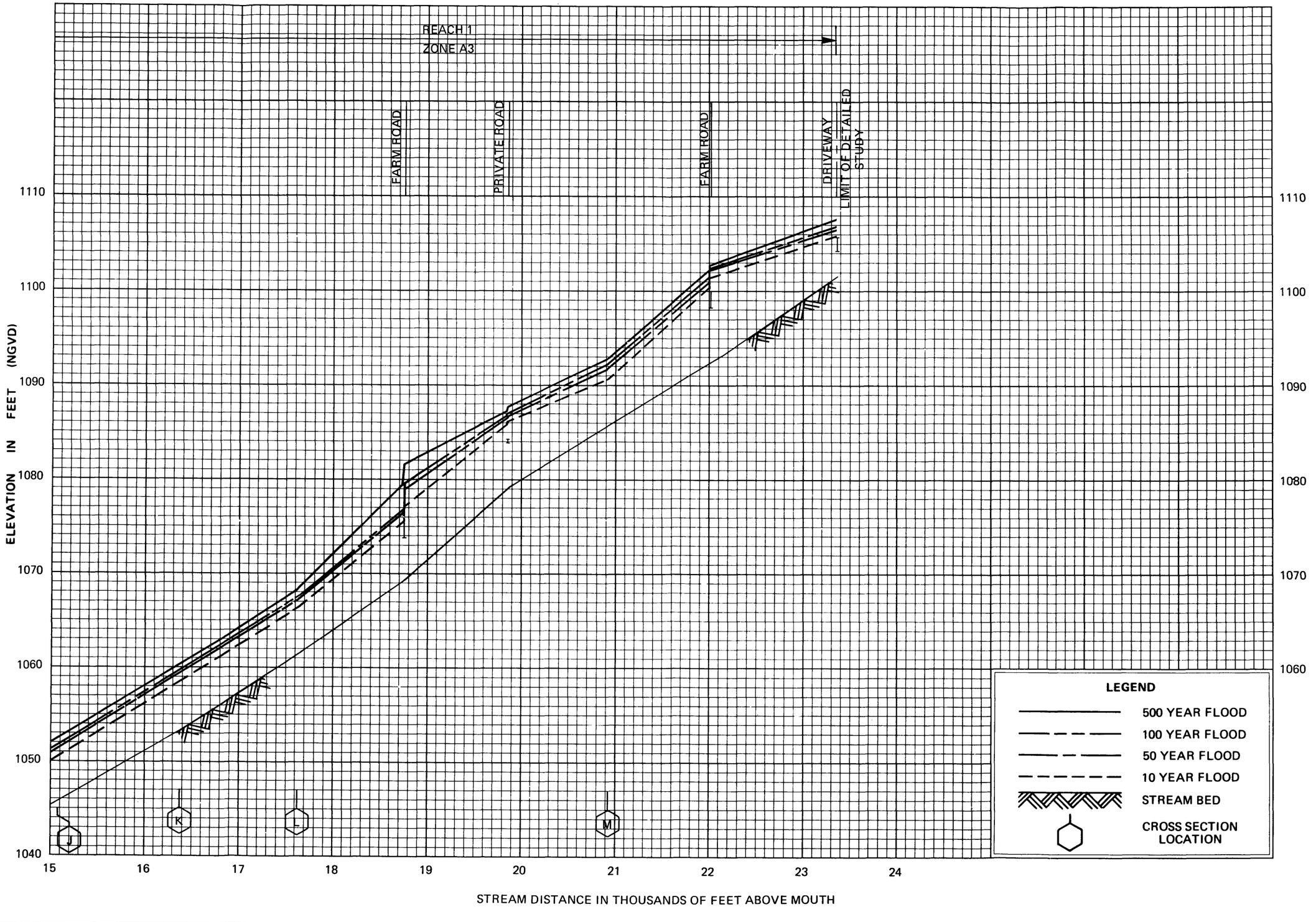
FLOOD PROFILES

GEORGES RUN

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

04P



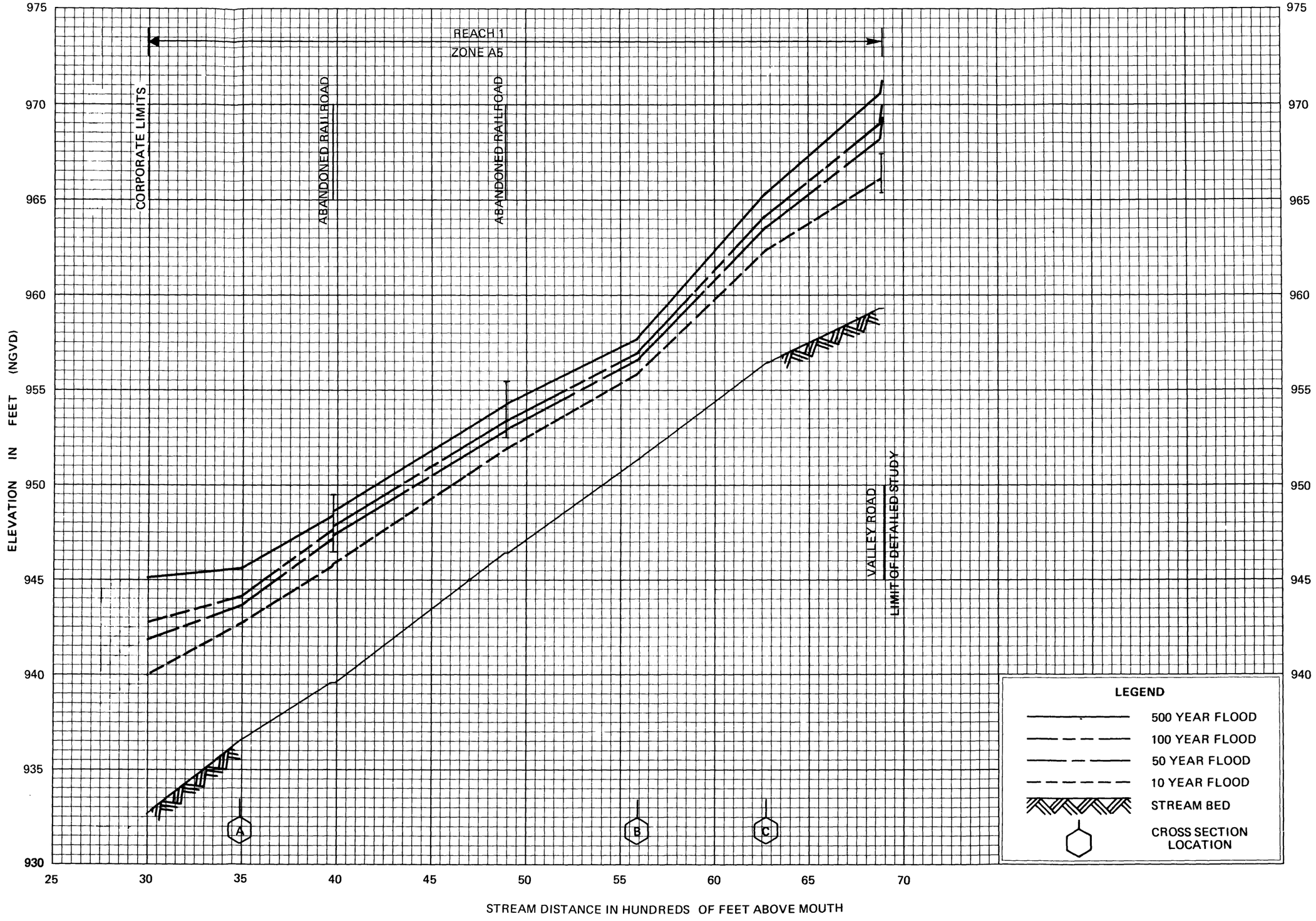
FLOOD PROFILES

GEORGES RUN

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

05P



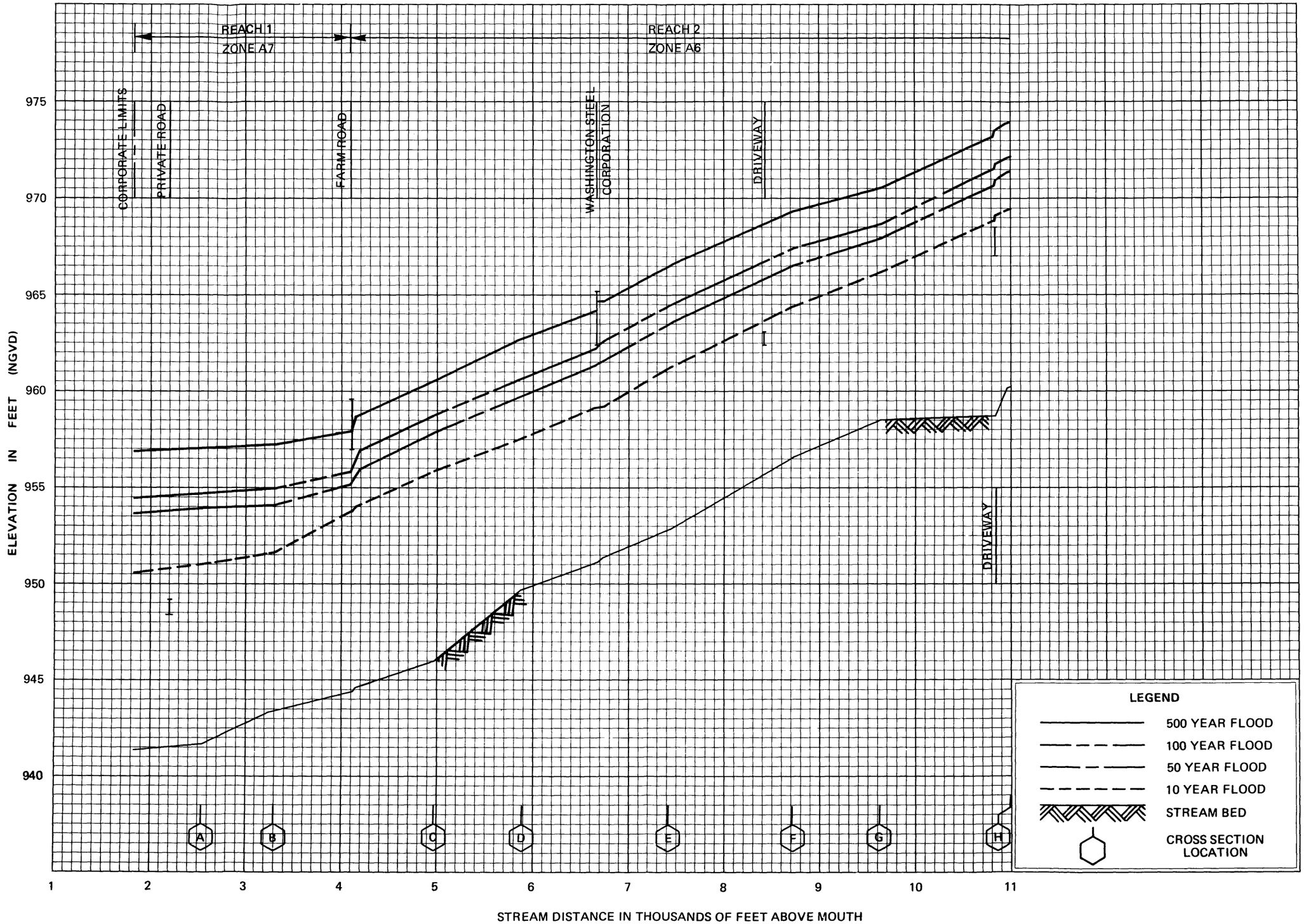
FLOOD PROFILES

BRUSH RUN

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

06P



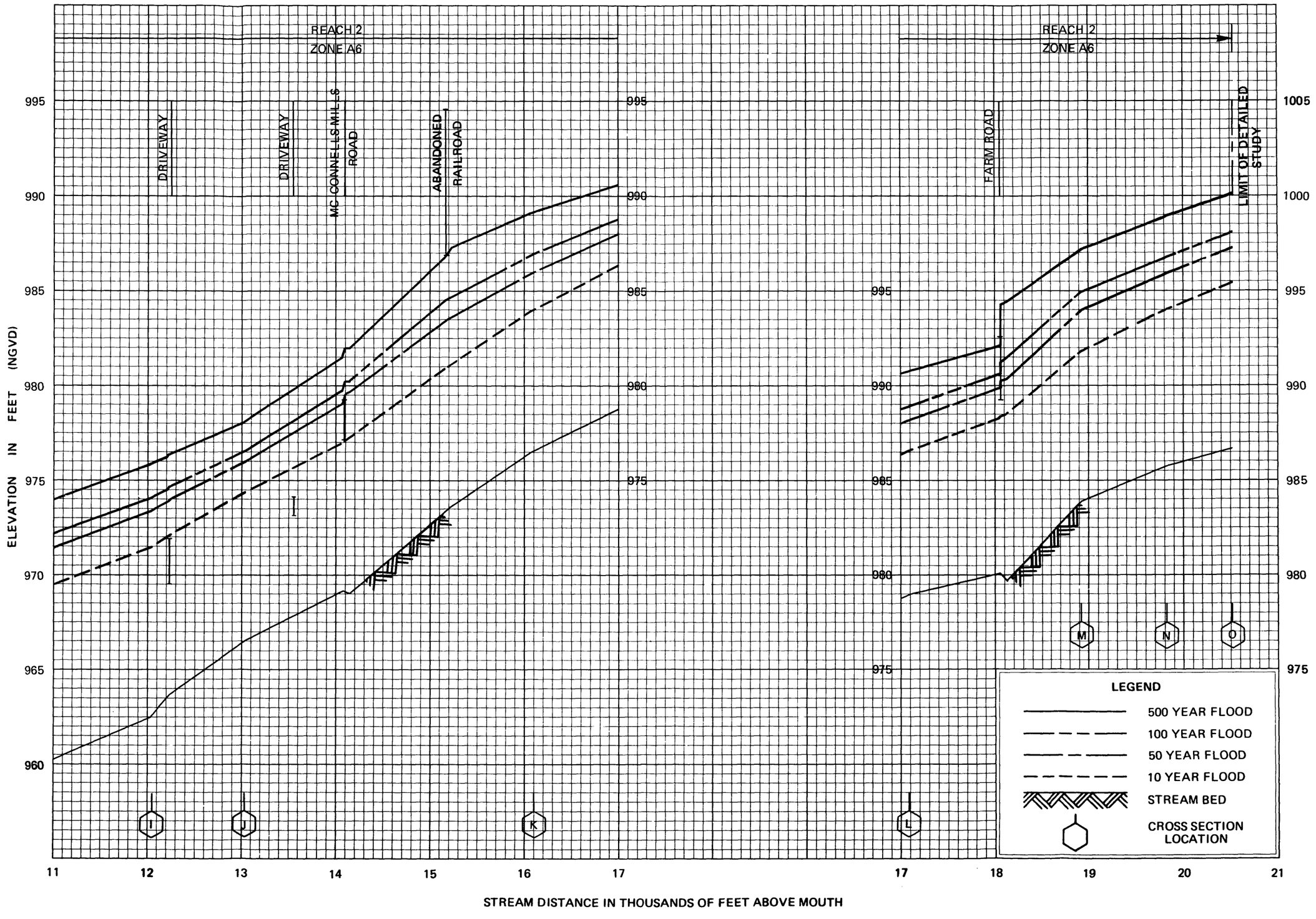
FLOOD PROFILES

CHARTIERS RUN

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

07P



FLOOD PROFILES

CHARTIERS RUN

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF CHARTIERS, PA
(WASHINGTON CO.)

08P

B-8 FEMA HEC-2 MICROFICHE DATA

June 1978
Existing Conditions
Condition before Completion
of COE Proposed Unit 2B

This information will apply and comprise the flood insurance study for this community until the COE proposed channelization project, Unit 2B is constructed.

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****************************************************
HEC2 RELEASE DATED NOV 76 UPDATED AUG1977
ERROR CORR - 01,02
MODIFICATION - 50,51,52,53, HBJ UPDATE MADE 16 JAN 5 PM
****************************************************

T1      35 NFA FIS (CONTRACT H-4553)
T2      CHARTIERS TOWNSHIP WASHINGTON CO.
T3      100 YR FLOOD-20-OCK-CHARTIERS RUN-NORMAL CHANNEL

J1  ICHECK    INQ      NINV     IDIR      STRT     METRIC    HVINS      Q        WSEL      FQ
      0.        4.       0.       0.   0.002500     0.0       0.0       0.     960.000    0.0

J2  NPROF    IPLOT    PRFVS    XSECV     XSECH      FN       ALLDC      IBW      CHNIM    ITRACE
    1.000     0.0    -1.000     0.0       0.0       0.0       0.0       0.0       0.0      0.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
   38.000   43.000    1.000    8.000   35.000   65.000   53.000   27.000   21.000   22.000

   20.000   54.000    4.000     0.0    38.000   39.000   42.000   33.000   40.000   41.000

    1.000   50.000   51.000   52.000    3.000   61.000   64.000  200.000     0.0      0.0

 ET     9.000  1920.000  3400.000  4200.000  6500.000  4200.000  4200.000  4200.000  4200.000  4200.000
 NC     0.0       0.0       0.0      0.300     0.500      0.0       0.0       0.0       0.0       0.0
 NC     0.100     0.100     0.040     0.0       0.0       0.0       0.0       0.0       0.0       0.0
 ET     0.0       0.0       0.0       0.0       0.0       0.0      5.400      0.0       0.0       0.0

 X1     0.010    11.000  1965.000  2030.000     0.0       0.0       0.0       0.0       0.0       0.0
 GR   960.000   950.000   948.000  1965.000   940.000  1975.000   936.500  1990.000   938.500  2010.000
 GR   942.000  2020.000   944.000  2030.000   946.000  2125.000   950.000  2135.000   950.000  2140.000
 GR   960.000  2150.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
 NC     0.100     0.100     0.040     0.0       0.0       0.0       0.0       0.0       0.0       0.0

 X1     0.300     9.000  1975.000  2024.000   422.000   422.000   422.000     0.0       0.0       0.0
 GR   980.000  1900.000   956.000  1900.000   951.500  1975.000   935.100  1975.000   938.100  2024.000
 GR   951.500  2024.000   951.800  2095.000   949.100  2170.000   960.000  2440.000     0.0       0.0
 NC     0.0       0.0       0.0      0.800     1.000      0.0       0.0       0.0       0.0       0.0
 ET     0.0       0.0       0.0       0.0       0.0       0.0      5.100      0.0    1975.000  2024.000

 X1     0.110     0.0       0.0       0.0      1.000     1.000     1.000      0.0       0.0       0.0
 BT     4.000  1975.000   951.500     0.0    1975.000   953.000   947.000  2024.000   953.000   947.000
 BT  2024.000   951.500     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
 NC     0.0       0.0       0.0      0.500     0.700      0.0       0.0       0.0       0.0       0.0
 ET     0.0       0.0       0.0       0.0       0.0       0.0      5.100      0.0    1975.000  2024.000

 X1     0.12.     0.0       0.0       0.0      14.000    14.000    14.000     0.0       0.0       0.0
 X2     0.0       0.0       0.0       0.0       0.0       0.0      1.000      0.0       0.0       0.0
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ET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	0.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.500	0.700	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	0.250	21.000	1976.000	2024.000	91.000	91.000	91.000	0.0	0.0	0.0	
GR	955.800	1185.000	957.600	1259.000	935.800	1178.000	925.800	1900.000	952.400	1900.000	
GR	850.700	1600.000	948.300	1700.000	947.300	1600.000	949.000	1617.000	950.300	1934.000	
GR	940.700	1976.000	939.600	1984.000	938.800	2000.000	938.800	2000.000	940.300	2012.000	
GR	955.400	2024.000	951.700	2044.000	951.000	2044.000	949.100	2044.000	955.300	2044.000	
GR	960.400	2440.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NC	0.0	0.0	0.0	0.600	1.000	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	14.400	0.0	0.0	0.0	
X1	0.210	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
BT	92.000	1954.000	950.300	0.0	1954.000	953.800	0.0	1970.000	954.100	940.700	
BT	1988.000	954.300	946.900	2000.000	954.500	949.600	2012.000	954.200	947.300	2029.000	
BT	954.900	942.400	2046.000	955.200	0.0	2046.000	951.700	0.0	0.0	0.0	
NC	0.0	0.0	0.0	0.500	0.700	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	15.400	0.0	0.0	0.0	
X1	0.220	0.0	0.0	0.0	44.000	49.000	49.000	0.0	0.0	0.0	
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	7.400	0.0	0.0	0.0	
X1	0.230	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
NC	0.0	0.0	0.0	0.500	1.500	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	2.400	0.0	0.0	0.0	
X1	0.250	10.000	1994.000	2017.000	50.000	50.000	50.000	0.0	0.0	0.0	
X4	1.000	960.700	1580.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
GR	960.000	1500.000	939.600	1994.000	935.200	1995.000	938.400	1997.000	938.200	2002.000	
GR	939.200	2011.000	940.400	2017.000	941.100	2030.000	953.700	2033.000	900.000	2040.000	
NC	0.100	0.060	0.035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ET	9.000	1640.000	2890.000	3510.000	5200.000	3510.000	3510.000	3510.000	3510.000	3510.000	
NC	0.0	0.0	0.0	0.500	0.700	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	
X1	0.300	12.000	1982.000	2018.000	375.000	325.000	359.000	0.0	0.0	0.0	
X4	1.000	954.000	1930.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
GR	960.000	1500.000	952.000	1940.000	952.000	1900.000	951.000	1962.000	949.700	1982.000	
GR	943.900	1982.000	940.400	1997.000	940.400	2006.000	943.100	2013.000	940.700	2018.000	
GR	953.000	2300.000	960.000	2400.000	0.0	0.0	0.0	0.0	0.0	0.0	
NC	0.0	0.0	0.0	0.500	1.000	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0	
X1	0.310	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
X4	1.000	954.000	1930.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
BT	3.000	1982.000	949.700	947.900	2018.000	949.700	947.900	2018.000	949.700	947.900	
NC	0.0	0.0	0.0	0.500	0.700	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0	
X1	0.320	0.0	0.0	0.0	20.000	20.000	20.000	0.0	0.0	0.0	
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0	
X4	1.000	954.000	1930.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0	
X1	0.330	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
X4	1.000	954.000	1930.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	12.400	0.0	0.0	0.0	
X1	0.350	21.000	1985.000	2015.000	50.000	50.000	50.000	0.0	0.0	0.0	
GR	961.600	1880.000	957.600	1523.000	954.300	1941.000	953.300	1950.000	954.100	1971.000	
GR	943.900	1985.000	942.700	1991.000	941.800	1992.000	941.200	1990.000	941.100	2000.000	

X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	956.000	956.200	0.0
BT	3.000	1978.000	960.600	958.000	2023.000	958.600	958.200	2023.000	958.600	958.200
KC	0.0	0.0	0.0	0.800	1.000	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1978.000	2023.000

X1	2.120	0.0	0.0	0.0	14.000	13.000	14.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	956.000	956.200	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0

X1	2.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X2	10.000	0.0	0.0	0.0	0.0	0.0	0.0	956.000	956.200	0.0
KC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0

X1	2.150	12.000	1990.000	2011.000	50.000	50.000	50.000	0.0	0.0	0.0
GR	970.300	1936.000	952.700	1966.000	946.500	1990.000	945.500	1992.000	949.700	1994.000
GR	944.700	2000.000	945.100	2005.000	945.900	2007.000	949.700	2011.000	950.300	2035.000
GR	960.000	2400.000	980.000	2750.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.150	0.150	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	5.400	0.0	0.0	0.0

X1	3.000	20.000	1981.000	2020.000	775.000	750.000	807.000	0.0	0.0	0.0
GR	972.000	1860.000	943.400	1870.000	963.400	1898.000	953.300	1925.000	952.300	1974.000
GR	951.400	1981.000	948.000	1985.000	947.000	1991.000	946.500	2000.000	946.000	2006.000
GR	946.300	2008.000	947.900	2011.000	951.500	2020.000	953.200	2043.000	957.200	2055.000
GR	959.500	2100.000	961.900	2175.000	962.000	2400.000	961.400	2429.000	960.700	2435.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0

X1	4.000	19.000	1975.400	2017.000	895.000	895.000	895.000	0.0	0.0	0.0
GR	975.100	1886.000	970.400	1900.000	969.500	1927.000	955.200	1955.000	953.000	1975.000
GR	951.400	1983.000	950.100	1990.000	949.700	1991.000	949.700	2003.000	949.700	2009.000
GR	950.100	2010.000	954.100	2017.000	955.000	2120.000	956.100	2143.000	960.300	2160.000
GR	962.100	2376.000	962.300	2459.000	961.000	2529.000	974.000	2553.000	0.0	0.0
NC	0.150	0.150	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0

X1	4.100	17.000	1975.000	2025.000	752.000	775.000	752.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	962.400	962.400	0.0
GR	973.700	1795.000	961.500	1819.000	962.300	1845.000	962.700	1900.000	963.000	1973.000
GR	951.100	1975.000	951.100	1987.000	952.500	2000.000	951.100	2018.000	951.100	2025.000
GR	963.600	2025.000	963.300	2100.000	962.800	2194.000	962.200	2246.000	962.400	2300.000
GR	961.900	2420.000	965.400	2432.000	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1973.000	2025.000

X1	4.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	962.400	962.400	0.0
BT	4.000	1975.000	963.600	0.0	1973.000	963.200	962.400	2025.000	963.200	962.400
BT	2025.000	963.600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1973.000	2025.000

X1	4.120	0.0	0.0	0.0	33.000	33.000	33.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	963.000	963.000	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1973.000	2025.000

X1	4.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	963.000	963.000	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	2.400	0.0	0.0	0.0

X1	1.150	12.000	1974.000	2015.000	50.000	50.000	50.000	0.0	0.0	0.0
X4	2.000	960.000	1920.000	963.500	1951.000	0.0	0.0	0.0	0.0	0.0
GR	980.000	1800.000	953.600	1974.000	952.000	1980.000	952.000	1990.000	951.500	1994.000
GR	951.400	2000.000	951.500	2007.000	952.000	2010.000	953.000	2012.000	953.700	2043.000
GR	960.200	2050.000	960.000	2350.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.150	0.150	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ET	2025.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	9.200	0.0	1975.000	2025.000	
X1	4.120	0.0	0.0	0.0	33.000	33.000	33.000	0.0	0.0	0.0	
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	963.000	963.000	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.200	0.0	1975.000	2025.000	
X1	4.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	961.000	963.000	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	2.400	0.0	0.0	0.0	
X1	4.150	12.000	1974.000	2015.000	50.000	50.000	50.000	0.0	0.0	0.0	
X4	2.000	900.000	1020.000	952.900	1507.000	0.0	0.0	0.0	0.0	0.0	
GR	980.000	1800.000	953.000	1574.000	953.000	1980.000	952.000	1950.000	951.500	1992.000	
GR	951.400	2000.000	951.500	2007.000	952.000	2010.000	953.000	2012.000	953.700	2015.000	
GR	960.200	2050.000	980.000	2550.000	0.0	0.0	0.0	0.0	0.0	0.0	
AC	0.150	0.150	0.055	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	1.400	0.0	0.0	0.0	
X1	5.000	17.000	1966.000	2014.000	650.000	600.000	675.000	0.0	0.0	0.0	
GR	977.100	1693.000	963.800	1911.000	964.200	1933.000	962.700	1947.000	957.000	1968.000	
GR	955.000	1991.000	953.500	1994.000	952.800	2000.000	953.000	2000.000	953.500	2005.000	
GR	957.900	2014.000	962.800	2053.000	963.900	2100.000	967.500	2060.000	965.700	2025.000	
GR	967.800	2500.000	972.500	2615.000	0.0	0.0	0.0	0.0	0.0	0.0	
QT	9.000	1640.000	2850.000	3510.000	5250.000	3510.000	3510.000	3510.000	3510.000	3510.000	
NC	0.150	0.150	0.055	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NC	0.0	0.0	0.0	0.100	0.000	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	13.400	0.0	0.0	0.0	
X1	6.000	15.000	1980.000	2012.000	1000.000	600.000	1300.000	0.0	0.0	0.0	
GR	980.700	1695.000	963.500	1731.000	962.700	1795.000	961.200	1920.000	960.000	1968.000	
GR	961.000	1980.000	958.500	1991.000	957.500	1992.000	956.000	2000.000	957.200	2005.000	
GR	957.400	2010.000	959.300	2012.000	960.500	2055.000	991.000	2100.000	991.000	2125.000	
ET	0.0	0.0	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	
X1	7.000	18.000	1977.000	2025.000	800.000	900.000	900.000	0.0	0.0	0.0	
GR	981.700	1800.000	968.300	1675.000	964.300	1710.000	964.200	1800.000	963.700	1800.000	
GR	962.600	1916.000	964.000	1945.000	964.500	1977.000	960.900	1964.000	958.800	1967.000	
GR	958.800	2000.000	958.500	2011.000	959.200	2014.000	960.300	2004.000	963.100	2020.000	
GR	964.600	2025.000	990.100	2065.000	991.000	2075.000	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.200	0.0	1975.000	2025.000	
X1	7.100	11.000	1985.000	2015.000	1174.000	1200.000	1209.000	0.0	0.0	0.0	
GR	985.000	1679.000	972.500	1793.000	966.200	1915.000	967.000	1934.000	966.500	1985.000	
GR	958.700	1985.000	958.700	2011.000	966.500	2015.000	985.200	2100.000	990.000	2117.000	
GR	993.800	2187.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2025.000	
X1	7.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
ET	0.0	1985.000	968.500	987.000	2015.000	986.500	987.000	2015.000	968.500	987.000	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2025.000	
X1	7.120	0.0	0.0	0.0	9.000	9.000	9.000	0.0	0.0	0.0	
X2	0.0	0.0	0.0	0.0	0.0	0.0	15.000	0.0	0.0	0.0	
AC	0.0	0.0	0.0	0.000	1.000	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2025.000	
X1	7.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	0.400	0.0	0.0	0.0	
X1	8.000	13.000	1978.000	2014.000	50.000	125.000	125.000	0.0	0.0	0.0	
GR	985.000	1679.000	972.500	1793.000	966.200	1915.000	967.000	1934.000	960.000	1978.000	
GR	961.500	1906.000	961.500	2000.000	960.200	2014.000	960.000	2013.000	960.000	2020.000	

NC	0.150	0.150	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NC	0.0	0.0	0.0	0.300	0.300	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	
X1	9.000	16.000	1985.000	2016.000	550.000	925.000	1078.000	0.0	0.0	0.0	
GR	985.300	1600.000	973.900	1700.000	965.100	1600.000	966.700	1958.000	970.400	1937.000	I
GR	971.100	1960.000	969.200	1985.000	963.700	1992.000	963.300	1998.000	968.300	2000.000	
GR	963.700	2010.000	966.900	2010.000	967.800	2000.000	972.100	2035.000	976.000	2000.000	
GR	985.700	2250.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
X1	9.100	14.000	1992.000	2005.000	168.000	185.000	188.000	0.0	0.0	0.0	
GR	985.300	1600.000	973.900	1700.000	969.100	1600.000	966.700	1958.000	970.400	1937.000	
GR	971.100	1960.000	971.800	1992.000	963.700	1992.000	963.700	2009.000	971.600	2000.000	
GR	967.600	2086.000	972.100	2150.000	976.000	2200.000	985.700	2250.000	0.0	0.0	
X1	9.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
BT	3.000	1992.000	971.800	966.600	2005.000	971.800	969.600	2009.000	971.800	969.600	
X1	9.120	0.0	0.0	0.0	12.000	12.000	12.000	0.0	0.0	0.0	
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0	
X1	9.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	4.400	0.0	0.0	0.0	
X1	10.000	14.000	1980.000	2020.000	788.000	788.000	788.000	0.0	0.0	0.0	J
GR	990.900	1500.000	987.800	1540.000	972.300	1603.000	973.600	1600.000	971.300	1915.000	
GR	971.300	1943.000	970.300	1952.000	970.700	1960.000	980.000	1980.000	980.500	2000.000	
GR	966.600	2014.000	968.100	2016.000	970.000	2020.000	992.800	2020.000	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1915.000	2031.000	
X1	10.100	17.000	1969.000	2031.000	1000.000	1160.000	1057.000	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	977.700	0.0	
GR	989.600	1748.000	981.500	1800.000	975.300	1622.000	977.300	1958.000	976.200	1905.000	
GR	976.800	1920.000	977.300	1935.000	976.900	1969.000	982.200	1969.000	969.200	1995.000	
GR	977.400	1999.000	977.500	2002.000	970.200	2002.000	972.900	2031.000	979.500	2031.000	
GR	982.600	2100.000	989.800	2104.000	0.0	0.0	0.0	0.0	0.0	0.0	
NC	0.0	0.0	0.0	0.600	1.000	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1915.000	2031.000	
X1	10.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	977.700	0.0	
BT	3.000	1969.000	978.500	977.200	2031.000	979.500	977.700	2031.000	979.500	977.700	
NC	0.0	0.0	0.0	0.300	0.500	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1915.000	2031.000	
X1	10.120	0.0	0.0	0.0	23.000	23.000	23.000	0.0	0.0	0.0	
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	977.700	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1915.000	2031.000	
X1	10.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	979.500	0.0	
NC	0.0	0.0	0.0	0.400	0.600	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0	
X1	10.150	15.000	1987.000	2010.000	50.000	50.000	50.000	0.0	0.0	0.0	
X4	2.000	960.000	1960.000	977.200	1976.000	0.0	0.0	0.0	0.0	0.0	
GR	1000.000	1750.000	972.400	1987.000	971.000	1995.000	969.700	1958.000	969.200	1997.000	
GR	969.000	2000.000	969.200	2002.000	969.800	2004.000	970.700	2005.000	971.400	2010.000	
GR	971.900	2029.000	970.100	2035.000	974.000	2048.000	980.000	2100.000	2100.000	2100.000	
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	

X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	975.500	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	5.100	0.0	1915.000	2031.000	
X1	10.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	975.500	0.0	
NC	0.0	0.0	0.0	0.400	0.400	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	3.400	0.0	0.0	0.0	
X1	10.150	15.000	1987.000	2016.000	30.000	30.000	30.000	0.0	0.0	0.0	
X4	2.000	980.000	1980.000	1977.100	1976.000	0.0	0.0	0.0	0.0	0.0	
GR	1000.000	1790.000	972.400	1987.000	971.000	1995.000	969.700	1990.000	969.200	1997.000	
GR	969.000	2000.000	965.200	2003.000	965.800	2004.000	970.700	2005.000	971.600	2016.000	
GR	971.900	2029.000	970.100	2035.000	974.000	2043.000	960.000	2100.000	1000.000	2000.000	
NC	0.0	0.0	0.0	0.100	0.500	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	
X1	10.200	10.000	1968.000	2032.000	1100.000	900.000	1012.000	0.0	0.0	0.0	
GR	1000.000	1000.000	992.500	1100.000	994.400	2968.000	977.000	1900.000	973.300	1992.000	
GR	973.300	2006.000	975.200	2032.000	994.600	2032.000	994.200	2100.000	1000.000	2130.000	
X1	10.210	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
BT	3.000	1968.000	994.400	986.700	2032.000	994.000	986.700	2032.000	994.000	986.700	
X1	10.220	0.0	0.0	0.0	10.000	10.000	10.000	0.0	0.0	0.0	
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0	
X1	10.230	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	5.400	0.0	0.0	0.0	
X1	10.250	11.000	1969.000	2018.000	50.000	50.000	50.000	0.0	0.0	0.0	
GR	993.100	1919.000	978.000	1964.000	975.000	1985.000	973.600	2000.000	974.900	2021.000	
GR	975.500	2010.000	977.200	2031.000	978.000	2009.000	982.200	2002.000	982.500	2100.000	
GR	993.800	2125.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	5.400	0.0	0.0	0.0	
X1	11.000	18.000	1975.000	2018.000	700.000	950.000	839.000	0.0	0.0	0.0	
GR	996.600	1910.000	988.400	1974.000	992.100	1996.000	992.500	1894.000	984.400	1719.000	
GR	982.400	1800.000	982.200	1967.000	983.000	1923.000	983.000	1951.000	980.400	1992.000	
GR	979.200	1975.000	977.400	1991.000	976.500	2005.000	977.000	2011.000	977.400	2011.000	
GR	982.700	2013.000	987.300	2030.000	986.600	2045.000	0.0	0.0	0.0	0.0	
QT	9.000	1380.000	2400.000	2950.000	4400.000	2950.000	2950.000	2950.000	2950.000	2950.000	
ET	0.0	0.0	0.0	0.0	0.0	0.0	7.400	0.0	0.0	0.0	
X1	12.000	19.000	1983.000	2028.000	875.000	1100.000	1000.000	0.0	0.0	0.0	
GR	1000.500	1672.000	998.400	1913.000	990.500	1927.000	984.700	1537.000	990.500	1999.000	
GR	985.000	1975.000	984.600	1981.000	979.200	1992.000	978.900	2000.000	979.200	2009.000	
GR	989.100	2019.000	984.800	2028.000	984.000	2001.000	983.600	2200.000	984.700	2022.000	
GR	985.400	2300.000	985.700	2350.000	986.000	2365.000	1000.500	2995.000	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	
X1	12.100	15.000	1979.000	2022.000	1000.000	850.000	961.000	0.0	0.0	0.0	
GR	1003.000	1748.000	996.900	1756.000	998.800	1776.000	995.900	1795.000	994.000	1849.000	
GR	993.000	1866.000	992.500	1979.000	980.000	1979.000	980.000	2012.000	985.300	2022.000	
GR	992.500	2022.000	991.300	2032.000	991.400	2120.000	993.600	2100.000	1002.300	2049.000	
NC	0.0	0.0	0.0	0.400	1.000	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1979.000	2022.000	
X1	12.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0	
BT	3.000	1979.000	992.500	985.300	2021.000	992.500	985.300	2022.000	992.500	985.300	
MC	0.0	0.0	0.0	0.100	0.500	0.0	0.0	0.0	0.0	0.0	
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1979.000	2022.000	
X1	12.120	0.0	0.0	0.0	16.000	16.000	16.000	0.0	0.0	0.0	

	X2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0
	X1	12.130	0.0	0.0	0.0	1.600	1.000	1.000	0.0	0.0	0.0
	X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	992.700	992.700	0.0
	AC	0.0	0.0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0
	X1	12.150	11.000	1586.000	2013.000	50.000	50.000	50.000	0.0	0.0	0.0
	X4	1.000	991.600	1965.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	GR	1000.000	1650.000	986.000	1981.000	985.500	1986.000	985.000	1985.000	986.500	1992.000
	GR	979.800	2000.000	979.600	2006.000	983.000	2011.000	984.200	2013.000	983.000	2029.000
	GR	1000.000	2225.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0
M	X1	13.000	22.000	1982.000	2020.000	800.000	800.000	800.000	0.0	0.0	0.0
	GR	1008.500	1505.000	1003.300	1552.000	1000.300	1563.000	1000.500	1579.000	1000.200	1606.000
	GR	1001.900	1719.000	998.200	1617.000	994.600	1667.000	992.700	1652.000	994.300	1628.000
	GR	990.600	1882.000	988.100	1851.000	988.600	1982.000	989.700	1987.000	984.300	1966.000
	GR	983.800	1994.000	983.900	2000.000	984.300	2008.000	990.000	2020.000	997.700	2029.000
	GR	996.700	2081.000	1005.400	2075.000	0.0	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0
N	X1	14.000	23.000	1976.000	2013.000	695.000	695.000	695.000	0.0	0.0	0.0
	GR	1006.300	1715.000	1000.400	1725.000	1000.400	1773.000	1001.300	1782.000	1001.600	1792.000
	GR	1001.400	1808.000	995.600	1832.000	993.600	1850.000	993.300	1866.000	992.300	1901.000
	GR	990.600	1970.000	988.700	1987.000	988.200	1997.000	985.900	2000.000	985.700	2005.000
	GR	986.200	2006.000	990.900	2015.000	990.300	2038.000	991.900	2064.000	990.900	2054.000
	GR	999.300	2145.000	1007.000	2222.000	1026.600	2222.000	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	7.400	0.0	0.0	0.0
O	X1	15.000	14.000	1973.000	2016.000	690.000	690.000	690.000	0.0	0.0	0.0
	GR	1008.300	1891.000	998.500	1918.000	994.600	1948.000	994.200	1973.000	988.000	1988.000
	GR	987.100	1968.000	986.600	1994.000	981.600	2000.000	987.300	2008.000	987.900	2009.000
	GR	991.800	2016.000	989.700	2031.000	992.600	2103.000	1006.500	2142.000	0.0	0.0
	EJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

*PROF 1

CCHV= 0.300 CEHV= 0.500

*SECAC .010

SECNO DEPTH CWSEL CRIWS KSELK EG HV HL ULOSS CHANELEV

THIS RUN EXECUTED 08/11/76 11.51

HEC2 RELEASE DATED NOV 76 UPDATED AUG1977
ERROR CORR - 01102
MODIFICATION - 50,51,52,53, MBJ UPDATE MADE 16 JAN 5 PP

J1 35 4PA FIS (CONTACT H-45531
T2 CHARTIERS TOWNSHIP, WASHINGTON CO.
T3 USGS 2" DGN CHARTIERS RUN

J1	ICHECK	INQ	NINV	IDIR	ITRT	METRIC	HVINS	4	WSEL	FQ
	0.	7.	00.	0.	0.0	0.0	0.0	0.	540.510	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLOC	ICO	CHNIM	ITWALE
	2.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

*PROF 2

J1 GCHV= 0.300 CENV= 0.500
*SECAD 010

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*SECNO 15.000
2800 NAT CI=    704.37  WSEL=    998.01  ENC CI=   704.31  WSEL=    998.71  RATIO=  0.0000
  NAT Q1=     817.  RATIOS LOB,CH,ROB=  0.0573  0.6203  0.3226  WSEL=    998.71

3470 ENCROACHMENT STATIONS=    1973.0    2083.5  TYPE=    4  TARGET=      0.138
      15.000    12.43    999.03    [illegible]    998.01    999.25    -0.25     1.29     0.01    994.20
      2950.       0.     2070.      880.        0.      435.     561.     536.      73.    951.00
      1.41      0.0      4.71      1.57     0.150    0.055    0.150    0.053   986.60   1973.00
   0.001715     690.     690.      690.        2        0        0      0.0    110.85   2083.85


                                                                    THIS RUN EXECUTED 08/11/78   11.56

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 HEC2 RELEASE DATED NOV 76 UPDATED AUG1977
 ERROR CORR - 01,02
 MODIFICATION - 50,51,52,53, HBJ UPDATE NA 2 16 JAN 5 PM
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T1     35 WPA FIS (CONTRACT H-4553)
T2     CHARTIERS TOWNSHIP WASHINGTON CO.
T3     10 YR FLOOD-29-CCK-CHARTIERS RUN

 J1  ICHECK    INQ     NINV    IDIR    STRT    METRIC   HVINS    Q      WSEL     FQ
        0.      2.      0.      0.  0.002500   0.0     0.0      0.   960.000   0.0

 J2  NPROF    IPLOT    PREVS   XSECV   XSECH    FN     ALLDC    IBW    CHNIM   ITRACE
      3.000    0.0    -1.000    0.0     0.0     0.0     0.0     0.0     0.0     0.0
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THIS RUN EXECUTED 08/11/78 11.5?

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HEC2 RELEASE DATED NOV 76 UPDATED AUG1977
ERROR CORR - 01,02
MODIFICATION - 50,51,52,53, HBJ UPDATE MADE 16 JAN 5 PM
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T1 35 WFA-FIS (CONTRACT H-4553)
T2 CHARTIERS TOWNSHIP WASHINGTON CO.
T3 50 YR FLOOD-2S-DCK-CHARTIERS RUN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	3.	0.	0.	0.002500	0.0	0.0	0.	960.000	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	4.000	0.0	-1.600	0.0	0.0	0.0	0.0	0.0	0.0	0.0

THIS RUN EXECUTED 0?/11/7? 12.?1

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HEC2 RELEASE DATED NOV 76 UPDATED AUG 1977
ERROR CORR - 01,02
MODIFICATION - 50,51,52,53, MBJ UPDATE MADE 16 JAN 5 PM
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T1      35 WPA FIS (CONTRACT F-45531
T2      CHARTIERS TOWNSHIP WASHINGTON CO.
T3      50CF-29-OCK-CHARTIERS RUN
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J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	5.	0.	0.	0.002500	0.0	0.0	0.	960.000	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1.58	1.18	5.45	1.73	0.150	0.035	0.150	0.035	980.00	1911.03	
0.001780	690.	690.	690.	2	0	0	0.0	211.08	2121.11	

THIS RUN EXECUTED 08/11/78 12:03

HEC2 RELEASE DATED NOV 76 UPDATED AUG1977
ERROR-CORR - 01,02
MODIFICATION - 50,51,52,53, MRJ UPDATE PAGE 16 JAN 5 PM

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

100 YR FLOOD-29-DCR-CHAR

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STAREA	STLHC	STCHR	STRGHT	ENDST	TOPWID
0.010	4200.00	948.53	12.03	0.0	0.0	1515.98	0.0	1965.00	2030.00	0.00	2130.35	2130.35
0.010	4200.00	949.53	13.03	0.0	0.0	1965.00	1965.00	1965.00	2030.00	2029.02	2029.02	62.62
0.010	1920.00	945.38	8.88	0.0	0.0	1575.98	0.0	1965.00	2030.00	0.00	2095.57	119.59
0.010	3400.00	947.27	11.17	0.0	0.0	1900.04	0.0	1965.00	2030.00	0.00	2133.36	168.71
0.010	6300.00	950.21	14.11	0.0	0.0	1770.43	0.0	1965.00	2030.00	0.00	2144.21	301.76
0.100	4200.00	949.51	11.41	422.00	422.00	1575.00	0.0	1975.00	2029.00	0.00	2130.13	70.00
0.100	4200.00	950.40	12.30	422.00	422.00	1575.00	1975.00	1975.00	2029.00	2029.00	2029.00	95.00
0.100	1920.00	946.36	8.26	422.00	422.00	1575.00	0.0	1975.00	2029.00	0.00	2029.00	95.00
0.100	3400.00	948.63	10.53	422.00	422.00	1575.00	0.0	1975.00	2029.00	0.00	2029.00	95.00
0.100	6300.00	951.19	13.09	422.00	422.00	1900.00	0.0	1975.00	2029.00	0.00	2141.65	218.62
0.110	4200.00	949.51	11.41	1.00	423.00	1575.00	0.0	1975.00	2029.00	0.00	2130.13	70.00
0.110	4200.00	950.40	12.30	1.00	423.00	1575.00	1975.00	1975.00	2029.00	2029.00	2029.00	95.00
0.110	1920.00	946.36	8.26	1.00	423.00	1575.00	0.0	1975.00	2029.00	0.00	2029.00	95.00
0.110	3400.00	948.63	10.53	1.00	423.00	1575.00	0.0	1975.00	2029.00	0.00	2029.00	95.00
0.110	6300.00	951.20	13.10	1.00	423.00	1900.00	0.0	1975.00	2029.00	0.00	2141.52	218.62
0.120	4200.00	949.65	11.55	14.00	437.00	1575.00	0.0	1975.00	2029.00	0.00	2130.12	70.00
0.120	4200.00	950.54	12.44	14.00	437.00	1575.00	1975.00	1975.00	2029.00	2029.00	2029.00	95.00
0.120	1920.00	946.41	8.31	14.00	437.00	1575.00	0.0	1975.00	2029.00	0.00	2029.00	95.00
0.120	3400.00	948.72	10.62	14.00	437.00	1575.00	0.0	1975.00	2029.00	0.00	2029.00	95.00
0.120	6300.00	954.48	16.38	14.00	437.00	1900.00	0.0	1975.00	2029.00	0.00	2203.46	443.62
0.130	4200.00	950.45	12.35	1.00	438.00	1900.00	0.0	1975.00	2029.00	0.00	2203.41	194.36
0.130	4200.00	951.49	13.39	1.00	438.00	1975.00	1975.00	1975.00	2029.00	2029.00	2029.00	95.00
0.130	1920.00	946.41	8.31	1.00	438.00	1575.00	0.0	1975.00	2029.00	0.00	2029.00	95.00
0.130	3400.00	948.82	10.62	1.00	438.00	1575.00	0.0	1975.00	2029.00	0.00	2029.00	95.00
0.130	6300.00	954.45	16.35	1.00	438.00	1900.00	0.0	1975.00	2029.00	0.00	2206.42	444.42
0.200	4200.00	951.10	12.30	91.00	529.00	1562.00	0.0	1975.00	2029.00	0.00	2130.59	69.66
0.200	4200.00	952.00	13.20	91.00	529.00	1757.82	1757.82	1975.00	2029.00	2029.00	2029.00	206.12
0.200	1920.00	948.91	7.11	91.00	529.00	1562.00	0.0	1975.00	2029.00	0.00	2033.71	71.09
0.200	3400.00	949.19	10.39	91.00	529.00	1655.71	0.0	1975.00	2029.00	0.00	2271.71	240.99
0.200	6300.00	955.07	16.27	91.00	529.00	1900.00	0.0	1975.00	2029.00	0.00	2206.24	440.31

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
0.210	4200.00	951.70	12.30	1.00	530.00	1562.03	0.0	1970.00	2024.00	0.0	2500.55	[illegible]
0.210	4200.00	952.00	13.20	1.00	530.00	1758.63	1758.63	1970.00	2024.00	2024.00	2024.00	265.37
0.210	1920.00	946.51	7.71	1.00	530.00	1962.00	0.0	1970.00	2024.00	0.0	2033.75	71.05
0.210	3400.00	949.19	10.39	1.00	530.00	1855.02	0.0	1970.00	2024.00	0.0	2270.75	390.00
0.210	6300.00	955.20	16.40	1.00	530.00	1403.43	0.0	1970.00	2024.00	0.0	2391.02	987.59
0.220	4200.00	951.60	12.60	49.00	579.00	1538.08	0.0	1970.00	2024.00	0.0	2315.01	777.15
0.220	4200.00	952.49	13.49	49.00	579.00	1754.37	1754.37	1970.00	2024.00	2052.61	2052.61	302.44
0.220	1920.00	946.85	8.05	49.00	579.00	1961.91	0.0	1970.00	2024.00	0.0	2034.32	72.61
0.220	3400.00	951.29	12.45	49.00	579.00	1552.76	0.0	1970.00	2024.00	0.0	2317.49	664.76
0.220	6300.00	955.24	16.44	49.00	579.00	1402.18	0.0	1970.00	2024.00	0.0	2391.74	989.55
0.230	4200.00	951.58	12.78	1.00	580.00	1538.82	0.0	1970.00	2024.00	0.0	2316.70	778.03
0.230	4200.00	952.61	13.81	1.00	580.00	1742.45	1742.45	1970.00	2024.00	2024.00	2024.00	281.55
0.230	1920.00	947.50	8.70	1.00	580.00	1759.51	0.0	1970.00	2024.00	0.0	2036.07	76.41
0.230	3400.00	951.29	12.49	1.00	580.00	1552.40	0.0	1970.00	2024.00	0.0	2312.41	665.14
0.230	6300.00	955.22	16.42	1.00	580.00	1402.01	0.0	1970.00	2024.00	0.0	2391.45	988.88
0.250	4200.00	951.65	13.45	50.00	630.00	1654.70	0.0	1999.00	2017.00	0.0	2083.55	226.83
0.250	4200.00	952.67	14.47	50.00	630.00	1943.90	1943.50	1999.00	2017.00	2030.09	2030.64	52.79
0.250	1920.00	947.59	9.39	50.00	630.00	1981.74	0.0	1999.00	2017.00	0.0	2030.79	37.05
0.250	3400.00	951.34	13.14	50.00	630.00	1887.96	0.0	1999.00	2017.00	0.0	2070.22	262.22
0.250	6300.00	955.25	17.05	50.00	630.00	1701.67	0.0	1999.00	2017.00	0.0	2237.23	535.66
0.300	3510.00	953.49	13.09	359.00	989.00	1932.57	0.0	1982.00	2018.00	0.0	2300.94	374.37
0.300	3510.00	954.23	13.83	359.00	989.00	1982.00	1982.00	1982.00	2018.00	2135.19	2135.19	153.19
0.300	1640.00	946.71	8.31	359.00	989.00	1982.00	0.0	1982.00	2018.00	0.0	2018.00	36.00
0.300	2890.00	952.48	12.08	359.00	989.00	1937.61	0.0	1982.00	2018.00	0.0	2255.46	317.82
0.300	5250.00	956.34	15.94	359.00	989.00	1782.20	0.0	1982.00	2018.00	0.0	2341.72	369.46
0.310	3510.00	953.83	13.43	1.00	990.00	1930.85	0.0	1982.00	2019.00	0.0	2311.85	381.00
0.310	3510.00	954.40	14.00	1.00	990.00	1982.00	1982.00	1982.00	2018.00	2130.32	2130.32	148.32
0.310	1640.00	948.71	8.31	1.00	990.00	1982.00	0.0	1982.00	2018.00	0.0	2018.00	36.00
0.310	2890.00	952.75	12.35	1.00	990.00	1930.26	0.0	1982.00	2018.00	0.0	2273.51	342.26
0.310	5250.00	955.49	16.09	1.00	990.00	1751.64	0.0	1982.00	2018.00	0.0	2349.84	598.20
0.320	3510.00	953.50	13.50	20.00	1010.00	1930.31	0.0	1982.00	2018.00	0.0	2312.22	382.30
0.320	3510.00	954.48	14.09	20.00	1010.00	1982.00	1982.00	1982.00	2018.00	2134.04	2134.04	152.04
0.320	1640.00	948.87	8.47	20.00	1010.00	1982.00	0.0	1982.00	2018.00	0.0	2018.00	36.00
0.320	2890.00	952.91	12.51	20.00	1010.00	1935.40	0.0	1982.00	2018.00	0.0	2292.07	356.61
0.320	5250.00	956.51	16.11	20.00	1010.00	1750.61	0.0	1982.00	2018.00	0.0	2350.05	599.44
0.330	3510.00	953.85	13.45	1.00	1011.00	1930.73	0.0	1982.00	2018.00	0.0	2312.00	381.47
0.330	3510.00	954.45	14.05	1.00	1011.00	1982.00	1982.00	1982.00	2018.00	2132.29	2132.23	150.23
0.330	1640.00	949.29	8.89	1.00	1011.00	1982.00	0.0	1982.00	2018.00	0.0	2018.00	36.00
0.330	2890.00	952.87	12.47	1.00	1011.00	1935.04	0.0	1982.00	2018.00	0.0	2289.04	353.42
0.330	5250.00	956.48	16.08	1.00	1011.00	1752.06	0.0	1982.00	2018.00	0.0	2349.76	597.70
0.350	3510.00	954.16	13.06	50.00	1061.00	1944.49	0.0	1985.00	2015.00	0.0	2327.90	383.41
0.350	3510.00	954.75	13.65	50.00	1061.00	1985.00	1985.00	1985.00	2015.00	2137.06	2137.06	152.06
0.350	1640.00	949.48	8.38	50.00	1061.00	1976.13	0.0	1985.00	2015.00	0.0	2111.14	135.01
0.350	2890.00	953.30	12.21	50.00	1061.00	1949.95	0.0	1985.00	2015.00	0.0	2316.45	366.54
0.350	5250.00	956.58	15.48	50.00	1061.00	1929.35	0.0	1985.00	2015.00	0.0	2390.16	460.81

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
0.400	3510.00	954.40	13.10	342.00	1403.00	1833.25	0.0	1989.00	2011.00	0.0	2172.42	339.17
0.400	3510.00	954.96	13.66	342.00	1403.00	1957.89	1957.89	1989.00	2011.00	2091.61	2091.61	133.72
0.400	1640.00	950.36	[illegible]	342.00	1403.00	1840.00	0.0	1989.00	2011.00	0.0	2151.55	311.74

SECNO	Q	CWSEL	DEPTH	XLCH	CUMDIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
0.350	3510.00	954.75	13.63	50.00	1061.00	1565.00	[illegible]	[illegible]	2015.00	[illegible]	2137.00	152.00
0.350	1640.00	949.48	8.38	50.00	1061.00	1570.13	0.0	1565.00	2015.00	0.0	2111.14	135.61
0.350	2890.00	953.30	12.21	50.00	1061.00	1549.95	0.0	1565.00	2015.00	0.0	2316.45	366.54
0.350	5250.00	956.58	15.42	50.00	1061.00	1524.35	0.0	1565.00	2015.00	0.0	2350.15	466.21
0.400	3510.00	954.40	13.10	342.00	1403.00	1833.25	0.0	1989.00	2011.00	0.0	2172.42	339.17
0.400	3510.00	954.55	13.06	342.00	1403.00	1952.85	1957.69	1989.00	2011.00	2091.61	2091.61	133.72
0.400	1640.00	950.36	9.00	342.00	1403.00	1840.10	0.0	1989.00	2011.00	0.0	2151.55	311.74
0.400	2890.00	953.58	12.28	342.00	1403.00	1834.05	0.0	1989.00	2011.00	0.0	2166.35	331.73
0.400	5250.00	956.75	15.45	342.00	1403.00	1829.22	0.0	1989.00	2011.00	0.0	2183.55	355.77
0.410	3510.00	954.44	13.14	1.00	1404.00	1833.17	0.0	1989.00	2011.00	0.0	2172.60	339.65
0.410	3510.00	955.06	13.76	1.00	1404.00	1958.59	1958.59	1989.00	2011.00	2091.00	2091.00	132.27
0.410	1640.00	950.45	9.15	1.00	1404.00	1840.02	0.0	1989.00	2011.00	0.0	2152.42	312.41
0.410	2890.00	951.62	12.32	1.00	1404.00	1834.55	0.0	1989.00	2011.00	0.0	2166.37	333.56
0.410	5250.00	956.78	15.46	1.00	1404.00	1829.16	0.0	1989.00	2011.00	0.0	2184.17	355.02
0.420	3510.00	954.45	13.15	11.00	1415.00	1833.16	0.0	1989.00	2011.00	0.0	2172.66	339.52
0.420	3510.00	955.07	13.77	11.00	1415.00	1958.95	1958.95	1989.00	2011.00	2091.09	2091.09	132.54
0.420	1640.00	950.46	9.17	11.00	1415.00	1840.00	0.0	1989.00	2011.00	0.0	2152.46	312.46
0.420	2890.00	951.62	12.32	11.00	1415.00	1834.54	0.0	1989.00	2011.00	0.0	2168.55	334.01
0.420	5250.00	956.75	15.45	11.00	1415.00	1829.15	0.0	1989.00	2011.00	0.0	2184.19	355.04
0.430	3510.00	954.44	13.14	1.00	1416.00	1833.15	0.0	1989.00	2011.00	0.0	2172.68	339.52
0.430	3510.00	955.05	13.76	1.00	1416.00	1956.93	1956.93	1989.00	2011.00	2092.23	2092.23	135.31
0.430	1640.00	950.45	9.15	1.00	1416.00	1840.01	0.0	1989.00	2011.00	0.0	2152.46	312.44
0.430	2890.00	952.61	12.31	1.00	1416.00	1834.56	0.0	1989.00	2011.00	0.0	2168.26	334.01
0.430	5250.00	956.78	15.46	1.00	1416.00	1829.15	0.0	1989.00	2011.00	0.0	2184.19	355.05
1.000	3510.00	954.63	12.58	819.00	2235.00	1822.43	0.0	1981.00	2021.00	0.0	2549.45	727.06
1.000	3510.00	955.51	13.61	819.00	2235.00	1974.00	1974.80	1981.00	2021.00	2396.76	2396.76	421.52
1.000	1640.00	950.55	9.25	819.00	2235.00	1850.59	0.0	1981.00	2021.00	0.0	2516.82	665.64
1.000	2890.00	953.85	12.15	819.00	2235.00	1860.49	0.0	1981.00	2021.00	0.0	2575.12	711.64
1.000	5250.00	957.06	15.30	819.00	2235.00	1852.00	0.0	1981.00	2021.00	0.0	2617.26	765.26
2.000	3510.00	954.52	11.53	760.00	2995.00	1967.69	0.0	1980.00	2021.00	0.0	2553.17	585.16
2.000	3510.00	955.80	12.40	760.00	2995.00	1980.00	1980.00	1980.00	2021.00	2314.84	2314.84	334.14
2.000	1640.00	951.29	8.19	760.00	2995.00	1976.02	0.0	1980.00	2021.00	0.0	2491.55	425.57
2.000	2890.00	954.17	10.71	760.00	2995.00	1969.72	0.0	1980.00	2021.00	0.0	2521.24	552.65
2.000	5250.00	957.19	13.79	760.00	2995.00	1962.02	0.0	1980.00	2021.00	0.0	2589.55	627.54
2.100	3510.00	955.42	11.42	802.00	3797.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.100	3510.00	956.79	12.39	802.00	3797.00	1978.00	1978.00	1978.00	2023.00	2023.00	2023.00	45.00
2.100	1640.00	953.76	9.36	802.00	3797.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.100	2890.00	955.21	10.81	802.00	3797.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.100	5250.00	957.86	13.46	802.00	3797.00	1978.00	0.0	1978.00	2023.00	0.0	2326.71	336.55
2.110	3510.00	955.82	11.42	1.00	3798.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.110	3510.00	956.78	12.38	1.00	3798.00	1978.00	1978.00	1978.00	2023.00	2023.00	2023.00	45.00
2.110	1640.00	953.76	9.36	1.00	3798.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.110	2890.00	955.21	10.81	1.00	3798.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.110	5250.00	958.11	13.71	1.00	3798.00	1978.00	0.0	1978.00	2023.00	0.0	2331.36	345.72
2.120	3510.00	955.56	11.96	14.00	3812.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.120	3510.00	956.90	12.50	14.00	3812.00	1978.00	1978.00	1978.00	2023.00	2023.00	2023.00	45.00
2.120	1640.00	953.81	9.41	14.00	3812.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.120	2890.00	955.32	10.92	14.00	3812.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.120	5250.00	958.31	13.91	14.00	3812.00	1978.00	0.0	1978.00	2023.00	0.0	2334.58	351.17

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
2.130	3510.00	95[illegible].97	11.57	1.00	3813.00	1578.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.130	3510.00	956.97	12.57	1.00	3813.00	1578.00	1578.00	1978.00	2023.00	2023.00	2023.00	45.00
2.130	1640.00	953.81	9.41	1.00	3813.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.130	2890.00	955.32	10.92	1.00	3813.00	1578.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.130	5250.00	958.32	13.92	1.00	3813.00	1978.00	0.0	1978.00	2023.00	0.0	2335.05	351.[illegible]
2.150	3510.00	956.86	12.16	50.00	3863.00	1958.90	0.0	1990.00	2011.00	0.0	2289.75	330.85
2.150	3510.00	957.67	12.97	50.00	3863.00	1990.00	1990.00	1990.00	2011.00	2120.65	2120.65	130.65
2.150	1640.00	953.95	9.25	50.00	3863.00	1961.87	0.0	1990.00	2011.00	0.0	2187.20	225.33
2.150	2890.00	955.55	11.25	50.00	3863.00	1960.46	0.0	1990.00	2011.00	0.0	2257.70	297.24
2.150	5250.00	95[illegible].67	13.97	50.00	3863.00	1955.82	0.0	1990.00	2011.00	0.0	2353.32	397.50
3.000	3510.00	958.69	12.67	807.00	4670.00	1910.59	0.0	1981.00	2020.00	0.0	2084.13	173.54
3.000	3510.00	959.43	13.63	807.00	4670.00	1934.83	1934.83	1981.00	2020.00	2036.31	2036.36	101.00
3.000	1640.00	955.78	9.28	807.00	4670.00	1918.38	0.0	1981.00	2020.00	0.0	2050.72	132.34
3.000	2890.00	957.83	11.83	807.00	4670.00	1912.89	0.0	1981.00	2020.00	0.0	2067.34	154.45
3.000	5250.00	960.55	14.54	807.00	4670.00	1905.65	0.0	1981.00	2020.00	0.0	2132.50	226.85
4.000	3510.00	960.63	10.92	895.00	5565.00	1944.39	0.0	1975.00	2017.00	0.0	2213.27	268.88
4.000	3510.00	961.37	11.67	895.00	5565.00	1974.08	1974.08	1975.00	2017.00	2115.47	2115.47	141.00
4.000	1640.00	957.47	7.77	895.00	5565.00	1950.97	0.0	1975.00	2017.00	0.0	2138.20	187.72
4.000	2890.00	959.70	10.00	895.00	5565.00	1946.18	0.0	1975.00	2017.00	0.0	2181.05	234.91
4.000	5250.00	962.68	12.96	895.00	5565.00	1940.35	0.0	1975.00	2017.00	0.0	2330.01	390.20
4.100	3510.00	962.24	11.14	792.00	6357.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.100	3510.00	962.89	11.79	792.00	6357.00	1975.00	1975.00	1975.00	2025.00	2025.00	2025.00	50.00
4.100	1640.00	959.05	7.96	792.00	6357.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.100	2890.00	961.33	10.23	792.00	6357.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.100	5250.00	964.23	13.13	792.00	6357.00	1814.27	0.0	1975.00	2025.00	0.0	2424.30	610.03
4.110	3510.00	962.25	11.15	1.00	6358.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.110	3510.00	962.86	11.76	1.00	6358.00	1975.00	1975.00	1975.00	2025.00	2025.00	2025.00	50.00
4.110	1640.00	959.06	7.96	1.00	6358.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.110	2890.00	961.34	10.24	1.00	6358.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.110	5250.00	964.22	13.13	1.00	6358.00	1814.26	0.0	1975.00	2025.00	0.0	2424.30	610.04
4.120	3510.00	962.37	11.27	33.00	6391.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.120	3510.00	963.07	11.97	33.00	6391.00	1975.00	1975.00	1975.00	2025.00	2025.00	2025.00	50.00
4.120	1640.00	959.13	8.03	33.00	6391.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.120	2890.00	961.45	10.35	33.00	6391.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.120	5250.00	964.72	13.62	33.00	6391.00	1813.25	0.0	1975.00	2025.00	0.0	2425.22	611.97
4.130	3510.00	962.38	11.28	1.00	6392.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.130	3510.00	963.17	12.07	1.00	6392.00	1975.00	1975.00	1975.00	2025.00	2025.00	2025.00	50.00
4.130	1640.00	959.13	8.03	1.00	6392.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.130	2890.00	961.45	10.35	1.00	6392.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.130	5250.00	964.69	13.59	1.00	6392.00	1813.32	0.0	1975.00	2025.00	0.0	2425.13	611.81
4.150	3510.00	962.61	11.21	50.00	6442.00	1904.33	0.0	1974.00	2015.00	0.0	2110.90	206.57
4.150	3510.00	963.33	11.93	50.00	6442.00	1934.29	1934.29	1974.00	2015.00	2047.55	2047.54	113.26
4.150	1640.00	959.17	7.77	50.00	6442.00	1934.07	0.0	1974.00	2015.00	0.0	2044.44	109.77
4.150	2890.00	961.58	10.18	50.00	6442.00	1910.46	0.0	1974.00	2015.00	0.0	2085.03	174.55
4.150	5250.00	964.75	13.35	50.00	6442.00	1891.32	0.0	1974.00	2015.00	0.0	2164.63	273.31

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
5.000	3510.00	963.62	11.62	673.00	7115.00	1912.08	0.0	1960.00	2014.00	0.0	2137.72	225.63
5.000	3510.00	964.96	12.96	673.00	7115.00	1956.90	1956.90	1960.00	2014.00	2057.67	2057.67	100.96
5.000	1640.00	961.19	8.39	673.00	7115.00	1954.47	0.0	1960.00	2014.00	0.0	2042.61	[illegible]
5.000	2890.00	963.64	10.64	673.00	7115.00	1957.88	0.0	1960.00	2014.00	0.0	2063.51	[illegible]

	SECAC	Q	CWSEL	DEPTH	PLCH	CLM DIS	SSTA	STEMCL	SICHL	STCHA	STEMCA	ENLST	TCPHIC	
E	5.000	3510.00	964.42	11.62	673.00	7115.00	1512.08	0.0	1560.00	2014.00	0.0	2137.72	223.03	E
	5.000	3510.00	964.96	12.06	673.00	7115.00	1550.90	1956.90	1560.00	2014.00	2057.67	2057.67	160.54	
	5.000	1640.00	961.19	8.39	673.00	7115.00	1554.47	0.0	1560.00	2014.00	0.0	2042.61	88.24	
	5.000	2890.00	963.48	10.68	673.00	7115.00	1547.60	0.0	1560.00	2014.00	0.0	2083.50	135.64	
	5.000	5250.00	966.49	13.69	673.00	7115.00	1540.53	0.0	1560.00	2014.00	0.0	2146.57	246.40	
F	6.000	3510.00	967.35	10.75	1360.00	6415.00	1727.59	0.0	1560.00	2012.00	0.0	2086.26	338.76	F
	6.000	3510.00	968.01	11.41	1360.00	6415.00	1680.39	1680.39	1560.00	2012.00	2014.47	2014.47	214.61	
	6.000	1640.00	964.40	7.80	1360.00	6415.00	1734.72	0.0	1560.00	2012.00	0.0	2001.17	342.51	
	6.000	2890.00	966.48	9.88	1360.00	6415.00	1729.21	0.0	1560.00	2012.00	0.0	2004.61	335.44	
	6.000	5250.00	969.28	12.68	1360.00	6415.00	1724.88	0.0	1560.00	2012.00	0.0	2009.46	346.06	
G	7.000	3510.00	968.04	10.14	963.00	9320.00	1687.15	0.0	1577.00	2025.00	0.0	2031.69	336.30	G
	7.000	3510.00	969.51	11.61	963.00	9320.00	1789.87	1789.87	1577.00	2025.00	2029.00	2029.00	259.11	
	7.000	1640.00	966.00	7.96	963.00	9320.00	1694.87	0.0	1577.00	2025.00	0.0	2027.42	334.75	
	7.000	2890.00	967.85	9.33	963.00	9320.00	1697.03	0.0	1577.00	2025.00	0.0	2030.22	327.15	
	7.000	5250.00	970.55	12.03	963.00	9320.00	1692.70	0.0	1577.00	2025.00	0.0	2034.37	341.66	
	7.100	3510.00	971.45	12.75	1265.00	10525.00	1829.74	0.0	1585.00	2015.00	0.0	2114.42	288.24	
	7.100	3510.00	972.16	13.46	1265.00	10525.00	1925.00	1925.00	1585.00	2015.00	2092.00	2092.00	167.60	
	7.100	1640.00	968.54	10.24	1265.00	10525.00	1964.26	0.0	1585.00	2015.00	0.0	2100.54	406.31	
	7.100	2890.00	970.74	12.04	1265.00	10525.00	1848.15	0.0	1585.00	2015.00	0.0	2112.58	264.25	
	7.100	5250.00	973.19	14.49	1265.00	10525.00	1786.71	0.0	1585.00	2015.00	0.0	2116.16	331.45	
	7.110	3510.00	971.87	12.57	1.00	10530.00	1816.63	0.0	1585.00	2015.00	0.0	2114.71	293.86	
	7.110	3510.00	972.35	13.05	1.00	10530.00	1925.00	1925.00	1585.00	2015.00	2092.00	2092.00	187.66	
	7.110	1640.00	968.98	10.28	1.00	10530.00	1963.63	0.0	1585.00	2015.00	0.0	2100.66	405.96	
	7.110	2890.00	970.92	12.22	1.00	10530.00	1842.43	0.0	1585.00	2015.00	0.0	2113.00	270.57	
	7.110	5250.00	973.45	14.75	1.00	10530.00	1789.33	0.0	1585.00	2015.00	0.0	2116.78	329.94	
	7.120	3510.00	971.75	13.05	5.00	10535.00	1816.63	0.0	1585.00	2015.00	0.0	2114.66	293.27	
	7.120	3510.00	972.42	13.72	5.00	10535.00	1925.00	1925.00	1585.00	2015.00	2092.00	2092.00	187.66	
	7.120	1640.00	969.08	10.38	5.00	10535.00	1963.63	0.0	1585.00	2015.00	0.0	2100.62	406.59	
	7.120	2890.00	971.00	12.30	5.00	10535.00	1839.90	0.0	1585.00	2015.00	0.0	2113.16	270.21	
	7.120	5250.00	973.51	14.81	5.00	10535.00	1788.87	0.0	1585.00	2015.00	0.0	2116.91	329.66	
	7.130	3510.00	971.75	13.05	1.00	10540.00	1816.63	0.0	1585.00	2015.00	0.0	2114.65	293.32	
	7.130	3510.00	972.42	13.73	1.00	10540.00	1925.00	1925.00	1585.00	2015.00	2092.00	2092.00	187.60	
	7.130	1640.00	969.08	10.39	1.00	10540.00	1963.63	0.0	1585.00	2015.00	0.0	2100.62	406.36	
	7.130	2890.00	971.00	12.30	1.00	10540.00	1839.74	0.0	1585.00	2015.00	0.0	2113.16	270.03	
	7.130	5250.00	973.51	14.81	1.00	10540.00	1788.74	0.0	1585.00	2015.00	0.0	2116.91	329.49	
H	8.000	3510.00	972.14	11.54	125.00	10600.00	1800.33	0.0	1578.00	2016.00	0.0	2115.77	311.44	H
	8.000	3510.00	972.77	12.17	125.00	10600.00	1931.72	1931.72	1578.00	2016.00	2083.12	2083.12	191.40	
	8.000	1640.00	969.43	8.83	125.00	10600.00	1887.02	0.0	1578.00	2016.00	0.0	2100.61	420.55	
	8.000	2890.00	971.39	10.79	125.00	10600.00	1827.81	0.0	1578.00	2016.00	0.0	2114.04	288.63	
	8.000	5250.00	973.88	13.28	125.00	10600.00	1769.76	0.0	1578.00	2016.00	0.0	2118.33	349.33	
I	9.000	3510.00	974.03	11.53	1070.00	11735.00	1697.63	0.0	1585.00	2016.00	0.0	2117.21	297.31	I
	9.000	3510.00	974.02	12.52	1070.00	11735.00	1821.93	1821.93	1585.00	2016.00	2082.24	2082.24	200.25	
	9.000	1640.00	971.35	8.85	1070.00	11735.00	1793.00	0.0	1585.00	2016.00	0.0	2103.61	367.93	
	9.000	2890.00	973.27	10.77	1070.00	11735.00	1713.10	0.0	1585.00	2016.00	0.0	2108.48	459.32	
	9.000	5250.00	975.76	13.26	1070.00	11735.00	1643.31	0.0	1585.00	2016.00	0.0	2117.46	313.93	

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENCST	TOPWID
9.100	3510.00	974.56	10.60	188.00	11523.00	1654.77	0.0	1952.00	2009.00	0.0	2162.65	467.60
9.100	3510.00	975.36	11.66	188.00	11523.00	1803.49	1803.49	1952.00	2009.00	2050.21	2050.21	266.71
9.100	1640.00	971.57	8.21	188.00	11523.00	1740.28	0.0	1952.00	2009.00	0.0	2152.66	412.59
9.100	2890.00	973.77	10.07	188.00	11523.00	1762.76	0.0	1952.00	2009.00	0.0	2174.24	411.48
9.100	5250.00	976.21	12.51	188.00	11523.00	1679.70	0.0	1952.00	2009.00	0.0	2201.07	521.31
9.110	3510.00	974.55	10.85	1.00	11524.00	1694.28	0.0	1952.00	2009.00	0.0	2163.49	469.22
9.110	3510.00	975.43	11.73	1.00	11524.00	1803.31	1803.31	1952.00	2009.00	2093.12	2093.12	289.81
9.110	1640.00	972.10	8.40	1.00	11524.00	1737.98	0.0	1952.00	2009.00	0.0	2154.94	417.30
9.110	2890.00	973.63	10.11	1.00	11524.00	1701.36	0.0	1952.00	2009.00	0.0	2175.62	473.06
9.110	5250.00	976.25	12.55	1.00	11524.00	1679.34	0.0	1952.00	2009.00	0.0	2201.25	521.90
9.120	3510.00	974.60	10.90	12.00	11536.00	1695.94	0.0	1952.00	2009.00	0.0	2163.74	468.80
9.120	3510.00	975.48	11.78	12.00	11536.00	1795.57	1795.57	1952.00	2009.00	2093.32	2093.32	297.75
9.120	1640.00	972.15	8.44	12.00	11536.00	1735.54	0.0	1952.00	2009.00	0.0	2155.52	[illegible]
9.120	2890.00	973.85	10.15	12.00	11536.00	1760.43	0.0	1952.00	2009.00	0.0	2175.51	415.16
9.120	5250.00	976.28	12.58	12.00	11536.00	1679.12	0.0	1952.00	2009.00	0.0	2201.49	522.32
9.130	3510.00	974.57	10.87	1.00	11537.00	1694.15	0.0	1952.00	2009.00	0.0	2163.40	469.31
9.130	3510.00	975.44	11.74	1.00	11537.00	1802.54	1802.54	1952.00	2009.00	2090.69	2090.69	288.34
9.130	1640.00	972.13	8.43	1.00	11537.00	1736.32	0.0	1952.00	2009.00	0.0	2155.17	418.55
9.130	2890.00	973.85	10.15	1.00	11537.00	1761.00	0.0	1952.00	2009.00	0.0	2135.22	474.22
9.130	5250.00	976.26	12.56	1.00	11537.00	1678.28	0.0	1952.00	2009.00	0.0	2201.35	522.67
10.000	3510.00	976.47	9.97	788.00	12725.00	1665.14	0.0	1960.00	2020.00	0.0	2024.51	205.37
10.000	3510.00	977.39	10.89	782.00	12725.00	1836.14	1836.14	1960.00	2020.00	2020.00	2020.00	183.86
10.000	1640.00	974.30	7.80	788.00	12725.00	1764.51	0.0	1960.00	2020.00	0.0	2025.47	261.16
10.000	2890.00	975.85	9.35	788.00	12725.00	1687.65	0.0	1960.00	2020.00	0.0	2027.65	339.64
10.000	5250.00	977.99	11.49	788.00	12725.00	1646.59	0.0	1960.00	2020.00	0.0	2030.52	383.93
10.100	3510.00	979.72	10.52	1057.00	13782.00	1817.82	0.0	1969.00	2031.00	0.0	2033.84	216.02
10.100	3510.00	980.34	[illegible]	1057.00	13782.00	1915.00	1915.00	1969.00	2031.00	2031.00	2031.00	116.00
10.100	1640.00	976.96	7.76	1057.00	13782.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	55.00
10.100	2890.00	978.55	9.75	1057.00	13782.00	1827.56	0.0	1969.00	2031.00	0.0	2031.00	203.44
10.100	5250.00	981.25	12.15	1057.00	13782.00	1801.52	0.0	1969.00	2031.00	0.0	2072.13	270.63
10.110	3510.00	979.73	[illegible]	1.00	13783.00	1817.78	0.0	1969.00	2031.00	0.0	2035.93	218.19
10.110	3510.00	980.35	[illegible]	1.00	13783.00	1915.00	1915.00	1969.00	2031.00	2031.00	2031.00	116.00
10.110	1640.00	976.96	7.76	1.00	13783.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	55.00
10.110	2890.00	979.00	9.80	1.00	13783.00	1827.52	0.0	1969.00	2031.00	0.0	2031.00	203.48
10.110	5250.00	981.63	12.43	1.00	13783.00	1799.16	0.0	1969.00	2031.00	0.0	2070.95	271.32
10.120	3510.00	980.20	11.00	23.00	13806.00	1812.55	0.0	1969.00	2031.00	0.0	2048.68	235.73
10.120	3510.00	980.84	11.64	23.00	13806.00	1915.00	1915.00	1969.00	2031.00	2031.00	2031.00	116.00
10.120	1640.00	977.04	7.84	23.00	13806.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	55.00
10.120	2890.00	979.42	10.22	23.00	13806.00	1820.87	0.0	1969.00	2031.00	0.0	2031.00	210.13
10.120	5250.00	981.96	12.76	23.00	13806.00	1797.12	0.0	1969.00	2031.00	0.0	2085.74	288.62
10.130	3510.00	980.20	11.00	1.00	13807.00	1812.91	0.0	1969.00	2031.00	0.0	2046.77	233.86
10.130	3510.00	980.56	11.76	1.00	13807.00	1915.00	1915.00	1969.00	2031.00	2031.00	2031.00	116.00
10.130	1640.00	977.04	7.84	1.00	13807.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	55.00
10.130	2890.00	979.50	10.30	1.00	13807.00	1820.02	0.0	1969.00	2031.00	0.0	2031.00	210.96
10.130	5250.00	981.91	12.71	1.00	13807.00	1797.43	0.0	1969.00	2031.00	0.0	2064.09	267.41

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENCST	TOPWID
10.150	3510.00	980.23	11.23	50.00	13857.00	1957.52	0.0	1987.00	2010.00	0.0	2101.16	143.64
10.150	3510.00	980.99	11.99	50.00	13857.00	1980.91	1980.91	1987.00	2010.00	2064.00	2065.55	83.08
10.150	1640.00	977.15	8.15	50.00	13857.00	1975.74	0.0	1987.00	2010.00	0.0	2075.20	99.54
10.150	2890.00	[illegible]	[illegible]	50.00	13857.00	[illegible]	0.0	1987.00	2010.00	0.0	[illegible]	[illegible]

10.130	3510.00	980.96	11.76	1.00	13807.00	[illegible]	[illegible]	1969.00	2031.00	2031.00	2031.00	[illegible]
10.130	1640.00	977.04	7.84	1.00	13807.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	[illegible]
10.130	2890.00	979.50	10.30	1.00	13807.00	1820.02	0.0	1969.00	2031.00	0.0	2031.00	210.98
10.130	5250.00	981.91	12.71	1.00	13807.00	1757.43	0.0	1969.00	2031.00	0.0	2064.64	307.21

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
10.150	3510.00	980.23	11.23	50.00	13857.00	1957.52	0.0	1987.00	2010.00	0.0	2101.10	143.58
10.150	3510.00	980.59	11.59	50.00	13857.00	1980.51	1980.51	1987.00	2010.00	2066.00	2065.55	85.04
10.150	1640.00	977.15	8.15	50.00	13857.00	1975.74	0.0	1987.00	2010.00	0.0	2075.28	99.54
10.150	2890.00	979.55	10.55	50.00	13857.00	1962.47	0.0	1987.00	2010.00	0.0	2096.12	133.65
10.150	5250.00	981.50	12.50	50.00	13857.00	1940.07	0.0	1987.00	2010.00	0.0	2105.45	165.42
10.200	3510.00	984.39	11.09	1012.00	14869.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.200	3510.00	984.73	11.43	1012.00	14869.00	1968.00	1968.00	1968.00	2032.00	2032.00	2032.00	64.00
10.200	1640.00	980.85	7.55	1012.00	14869.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.200	2890.00	983.38	10.08	1012.00	14869.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.200	5250.00	986.74	13.44	1012.00	14869.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.210	3510.00	984.39	11.09	1.00	14870.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.210	3510.00	984.73	11.43	1.00	14870.00	1968.00	1968.00	1968.00	2032.00	2032.00	2032.00	64.00
10.210	1640.00	980.85	7.56	1.00	14870.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.210	2890.00	983.38	10.08	1.00	14870.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.210	5250.00	986.74	13.44	1.00	14870.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.220	3510.00	984.42	11.12	10.00	14880.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.220	3510.00	984.75	11.45	10.00	14880.00	1968.00	1968.00	1968.00	2032.00	2032.00	2032.00	64.00
10.220	1640.00	980.88	7.58	10.00	14880.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.220	2890.00	983.41	10.11	10.00	14880.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.220	5250.00	986.80	13.50	10.00	14880.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.230	3510.00	984.42	11.12	1.00	14881.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.230	3510.00	984.76	11.46	1.00	14881.00	1968.00	1968.00	1968.00	2032.00	2032.00	2032.00	64.00
10.230	1640.00	980.88	7.58	1.00	14881.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.230	2890.00	983.41	10.11	1.00	14881.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.230	5250.00	986.82	13.52	1.00	14881.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.250	3510.00	984.62	11.62	50.00	14931.00	1947.07	0.0	1969.00	2018.00	0.0	2105.15	157.57
10.250	3510.00	984.87	11.87	50.00	14931.00	1969.00	1969.00	1969.00	2018.00	2062.70	2062.70	53.70
10.250	1640.00	980.57	7.57	50.00	14931.00	1959.18	0.0	1969.00	2018.00	0.0	2077.57	118.39
10.250	2890.00	983.56	10.56	50.00	14931.00	1930.55	0.0	1969.00	2018.00	0.0	2102.74	172.19
10.250	5250.00	987.18	14.18	50.00	14931.00	1938.61	0.0	1969.00	2018.00	0.0	2110.20	171.59
11.000	3510.00	986.77	10.27	859.00	15790.00	1711.65	0.0	1975.00	2013.00	0.0	2028.14	316.49
11.000	3510.00	987.47	10.97	859.00	15790.00	1845.49	1845.49	1975.00	2013.00	2013.00	2013.00	167.51
11.000	1640.00	983.86	7.36	859.00	15790.00	1740.72	0.0	1975.00	2013.00	0.0	2017.20	276.58
11.000	2890.00	985.87	9.37	859.00	15790.00	1714.40	0.0	1975.00	2013.00	0.0	2024.65	310.21
11.000	5250.00	989.06	12.56	859.00	15790.00	1680.75	0.0	1975.00	2013.00	0.0	2032.21	344.41
12.000	2950.00	985.51	9.51	1000.00	16790.00	1952.92	0.0	1983.00	2028.00	0.0	2402.54	450.02
12.000	2950.00	985.74	9.74	1000.00	16790.00	1983.00	1983.00	1983.00	2028.00	2237.60	2237.60	254.60
12.000	1380.00	983.63	7.63	1000.00	16790.00	1964.50	0.0	1983.00	2028.00	0.0	2391.25	426.75
12.000	2430.00	985.12	9.26	1000.00	16790.00	1956.70	0.0	1983.00	2028.00	0.0	2400.27	443.57
12.000	4400.00	990.70	11.80	1000.00	16790.00	1920.52	0.0	1983.00	2028.00	0.0	2403.76	483.24
12.100	2950.00	993.53	10.53	961.00	17751.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00
12.100	2950.00	991.53	11.33	961.00	17751.00	1979.00	1979.00	1979.00	2022.00	2022.00	2022.00	43.00
12.100	1380.00	986.23	6.23	961.00	17751.00	1979.00	0.0	1979.00	2022.00	0.0	2026.65	46.65
12.100	2430.00	[illegible]	9.64	961.00	17751.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00
12.100	4400.00	991.56	11.56	961.00	17751.00	1975.00	0.0	1979.00	2022.00	0.0	2131.35	156.20

	SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
	12.110	2950.00	990.51	10.51	1.00	17752.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00
	12.110	2950.00	991.33	11.33	1.00	17752.00	1979.00	1979.00	1979.00	2022.00	2022.00	2022.00	43.00
	12.110	1380.00	988.24	8.24	1.00	17752.00	1979.00	0.0	1979.00	2022.00	0.0	2020.22	41.22
	12.110	2400.00	989.85	9.85	1.00	17752.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	42.00
	12.110	4400.00	991.98	11.98	1.00	17752.00	1979.00	0.0	1979.00	2022.00	0.0	2130.76	136.61
	12.120	2950.00	990.70	10.70	16.00	17768.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00
	12.120	2950.00	991.59	11.59	16.00	17768.00	1979.00	1979.00	1979.00	2022.00	2022.00	2022.00	43.00
	12.120	1380.00	988.28	8.28	16.00	17768.00	1979.00	0.0	1979.00	2022.00	0.0	2020.50	41.50
	12.120	2400.00	990.01	10.01	16.00	17768.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00
	12.120	4400.00	993.99	13.99	16.00	17768.00	1843.19	0.0	1979.00	2022.00	0.0	2166.72	323.53
	12.130	2950.00	991.17	11.17	1.00	17769.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00
	12.130	2950.00	992.13	12.13	1.00	17769.00	1979.00	1979.00	1979.00	2022.00	2022.00	2022.00	43.00
	12.130	1380.00	988.29	8.29	1.00	17769.00	1979.00	0.0	1979.00	2022.00	0.0	2020.91	41.91
	12.130	2400.00	990.16	10.16	1.00	17769.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00
	12.130	4400.00	994.19	14.19	1.00	17769.00	1636.36	0.0	1979.00	2022.00	0.0	2166.63	530.27
	12.150	2950.00	991.35	11.76	50.00	17819.00	1565.78	0.0	1988.00	2013.00	0.0	2088.30	522.00
	12.150	2950.00	992.26	12.66	50.00	17819.00	1576.55	1576.55	1988.00	2013.00	2051.42	2051.42	474.87
	12.150	1380.00	988.39	8.79	50.00	17819.00	1574.16	0.0	1988.00	2013.00	0.0	2041.53	467.37
	12.150	2400.00	990.32	10.72	50.00	17819.00	1577.66	0.0	1988.00	2013.00	0.0	2071.56	493.90
	12.150	4400.00	994.34	14.74	50.00	17819.00	1862.33	0.0	1988.00	2013.00	0.0	2135.50	273.17
M	13.000	2950.00	994.50	11.10	806.00	18625.00	1841.35	0.0	1982.00	2020.00	0.0	2028.51	187.31
	13.000	2950.00	995.58	12.18	806.00	18625.00	1916.54	1916.54	1982.00	2020.00	2020.00	2020.00	103.46
	13.000	1380.00	991.71	7.91	806.00	18625.00	1867.18	0.0	1982.00	2020.00	0.0	2023.21	159.53
	13.000	2400.00	993.52	10.12	806.00	18625.00	1848.82	0.0	1982.00	2020.00	0.0	2027.11	178.29
	13.000	4400.00	997.13	13.33	806.00	18625.00	1801.00	0.0	1982.00	2020.00	0.0	2032.56	231.56
N	14.000	2950.00	996.73	11.00	655.00	15520.00	1841.45	0.0	1970.00	2013.00	0.0	2097.44	255.99
	14.000	2950.00	997.63	11.93	655.00	15520.00	1915.29	1915.29	1970.00	2013.00	2050.50	2050.90	135.61
	14.000	1380.00	993.87	8.17	655.00	15520.00	1849.79	0.0	1970.00	2013.00	0.0	2085.32	235.73
	14.000	2400.00	995.00	10.10	655.00	15520.00	1844.09	0.0	1970.00	2013.00	0.0	2094.52	240.43
	14.000	4400.00	998.75	13.05	855.00	15520.00	1835.30	0.0	1970.00	2013.00	0.0	2134.87	295.57
O	15.000	2950.00	998.01	11.41	650.00	20210.00	1914.55	0.0	1975.00	2016.00	0.0	2118.26	201.72
	15.000	2950.00	999.03	12.43	650.00	20210.00	1973.00	1973.00	1973.00	2016.00	2083.85	2083.85	110.85
	15.000	1380.00	995.31	8.71	650.00	20210.00	1939.01	0.0	1975.00	2016.00	0.0	2109.65	170.63
	25.000	2400.00	997.16	10.56	650.00	20210.00	1916.49	0.0	1975.00	2016.00	0.0	2114.15	197.70
	15.000	4400.00	999.98	13.38	650.00	20210.00	1910.03	0.0	1975.00	2016.00	0.0	2121.14	211.06

100 YR FLOOD-25-DCK-CHAN

SUMMARY PRINTOUT

ICO_VR_FLOCD-2S-OCR-CHAR

SUMMARY PRINTOUT

SECNO	XLCH	ELMIN	KMCHSL	ELTRD	ELLC	CHSEL	DIFHSP	DIFHSX	DIFHAS	EG	DIFEC	INPUT E
0.010	0.0	936.50	0.0	0.0	0.0	945.53	0.0	0.0	-11.47	949.20	0.0	0.0
0.010	0.0	936.50	0.0	0.0	0.0	945.51	1.00	0.0	-1.00	950.[illegible]	-1.64	0.46
0.010	0.0	936.50	0.0	0.0	0.0	945.36	-4.15	0.0	-14.02	949.96	-3.[illegible]	0.0
0.010	0.0	936.50	0.0	0.0	0.0	947.07	2.29	0.0	-12.33	948.28	-0.51	0.0
0.010	0.0	936.50	0.0	0.0	0.0	950.21	2.93	0.0	-9.19	951.46	-1.01	0.0
0.100	422.00	938.10	3.79	0.0	0.0	949.21	0.0	0.98	0.0	950.38	0.0	0.0
0.100	422.00	938.10	3.79	0.0	0.0	950.46	0.89	0.87	0.85	951.13	-0.77	0.46
0.100	422.00	938.10	3.79	0.0	0.0	948.38	-4.02	1.00	0.0	949.13	-3.05	0.0
0.100	422.00	938.10	3.79	0.0	0.0	948.03	2.24	0.98	0.0	949.30	-1.[illegible]	0.0
0.100	422.00	938.10	3.79	0.0	0.0	951.19	2.97	0.99	0.0	952.[illegible]	-0.[illegible]	0.0
0.110	1.00	938.10	0.0	951.50	947.00	949.21	0.0	0.00	0.0	950.[illegible]	0.0	0.0
0.110	1.00	938.10	0.0	951.50	947.00	950.46	0.89	0.87	0.85	951.13	-0.77	0.46
0.110	1.00	938.10	0.0	951.50	947.00	948.38	-4.02	1.00	0.0	949.13	-3.05	0.0
0.110	1.00	938.10	0.0	951.50	947.00	948.03	2.24	0.98	0.0	949.30	-1.[illegible]	0.0
0.110	1.00	938.10	0.0	951.50	947.00	951.19	2.97	0.99	0.0	952.[illegible]	-0.[illegible]	0.0
0.120	14.00	938.10	0.0	951.50	947.00	949.65	0.0	0.14	0.0	950.31	0.0	0.0
0.120	14.00	938.10	0.0	951.50	947.00	950.34	0.69	0.14	0.85	951.81	-0.[illegible]	0.[illegible]
0.120	14.00	938.10	0.0	951.50	947.00	948.41	-4.14	0.02	0.0	949.13	-3.[illegible]	0.0
0.120	14.00	938.10	0.0	951.50	947.00	948.72	2.31	0.05	0.0	949.[illegible]	-1.[illegible]	0.0
0.120	14.00	938.10	0.0	951.50	947.00	951.[illegible]	3.[illegible]	0.[illegible]	0.0	952.[illegible]	-0.[illegible]	0.0
0.130	1.00	938.10	0.0	0.0	0.0	950.45	0.0	0.[illegible]	0.0	951.[illegible]	0.0	0.0
0.130	1.00	938.10	0.0	0.0	0.0	951.49	1.04	0.93	1.04	952.[illegible]	-0.[illegible]	0.[illegible]
0.130	1.00	938.10	0.0	0.0	0.0	949.41	-3.08	0.00	0.0	950.[illegible]	-4.[illegible]	0.0
0.130	1.00	938.10	0.0	0.0	0.0	949.02	2.82	0.31	0.0	950.[illegible]	-1.[illegible]	0.0
0.130	1.00	938.10	0.0	0.0	0.0	952.[illegible]	3.[illegible]	0.[illegible]	0.0	953.[illegible]	-0.[illegible]	0.0
0.200	91.00	938.80	7.69	0.0	0.0	951.[illegible]	0.0	0.[illegible]	0.0	951.[illegible]	0.0	0.0
0.200	91.00	938.80	7.69	0.0	0.0	952.[illegible]	0.96	0.91	0.[illegible]	952.[illegible]	0.[illegible]	0.[illegible]
0.200	91.00	938.80	7.69	0.0	0.0	949.21	-3.[illegible]	0.[illegible]	0.0	950.[illegible]	-4.[illegible]	0.0
0.200	91.00	938.80	7.69	0.0	0.0	949.[illegible]	2.[illegible]	0.[illegible]	0.0	949.[illegible]	-1.[illegible]	0.0
0.200	91.00	938.80	7.69	0.0	0.0	952.[illegible]	3.[illegible]	0.[illegible]	0.0	953.[illegible]	-0.[illegible]	0.0
0.210	1.00	938.80	0.0	950.30	948.00	951.[illegible]	0.0	0.00	0.0	951.[illegible]	0.0	0.0
0.210	1.00	938.80	0.0	950.30	948.00	952.[illegible]	0.[illegible]	0.00	0.[illegible]	952.[illegible]	-0.[illegible]	12.46
0.210	1.00	938.80	0.0	950.30	948.00	949.21	-3.[illegible]	0.00	0.0	947.[illegible]	-4.[illegible]	0.0
0.210	1.00	938.80	0.0	950.30	948.00	949.[illegible]	2.[illegible]	0.00	0.0	950.[illegible]	-1.[illegible]	0.0
0.210	1.00	938.80	0.0	950.30	948.00	952.[illegible]	3.[illegible]	0.[illegible]	0.0	953.[illegible]	-0.[illegible]	0.0
0.220	49.00	938.80	0.0	950.30	948.00	951.[illegible]	0.0	0.[illegible]	0.0	951.[illegible]	0.0	0.0
0.220	49.00	938.80	0.0	950.30	948.00	952.[illegible]	0.[illegible]	0.[illegible]	0.[illegible]	952.[illegible]	-1.[illegible]	12.46
0.220	49.00	938.80	0.0	950.30	948.00	948.[illegible]	-3.[illegible]	0.[illegible]	0.0	947.[illegible]	-4.[illegible]	0.0
0.220	49.00	938.80	0.0	950.30	948.00	951.[illegible]	4.[illegible]	2.[illegible]	0.0	951.[illegible]	-0.[illegible]	0.0
0.220	49.00	938.80	0.0	950.30	948.00	952.[illegible]	3.[illegible]	0.[illegible]	0.0	953.[illegible]	0.[illegible]	0.0
0.230	1.00	938.80	0.0	0.0	0.0	951.[illegible]	0.0	-0.[illegible]	0.0	951.[illegible]	0.0	0.0
0.230	1.00	938.80	0.0	0.0	0.0	952.[illegible]	0.[illegible]	1.00	0.[illegible]	952.[illegible]	-1.[illegible]	12.[illegible]
0.230	1.00	938.80	0.0	0.0	0.0	947.[illegible]	-3.[illegible]	0.00	0.0	947.[illegible]	-3.[illegible]	0.0
0.230	1.00	938.80	0.0	0.0	0.0	951.[illegible]	3.[illegible]	-0.[illegible]	0.0	951.[illegible]	-0.[illegible]	0.0
0.230	1.00	938.80	0.0	0.0	0.0	952.[illegible]	3.[illegible]	-0.[illegible]	0.0	953.[illegible]	0.[illegible]	0.0

SECNO	XLCH	ELMIN	K*CHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
0.250	50.00	938.20	-12.00	0.0	0.0	951.65	0.0	0.07	0.0	952.89	0.0	0.0
0.250	50.00	938.20	-12.00	0.0	0.0	952.67	1.02	0.06	1.02	953.76	0.87	2.40
0.250	50.00	938.20	-12.00	0.0	0.0	947.59	-5.08	0.09	0.0	948.38	-4.51	0.0
0.250	50.00	938.20	-12.00	0.0	0.0	951.34	3.74	0.03	0.0	952.24	-0.65	0.0
0.250	50.00	938.20	-12.00	0.0	0.0	955.25	3.91	0.0	0.0	955.56	3.07	0.0
0.300	359.00	940.40	6.13	0.0	0.0	953.49	0.0	1.04	0.0	955.56	0.0	0.0
0.300	359.00	940.40	6.13	0.0	0.0	954.23	0.74	1.30	0.74	956.04	0.72	4.40
0.300	359.00	940.40	6.13	0.0	0.0	948.71	-5.52	1.12	0.0	949.38	-4.96	0.0
0.300	359.00	940.40	6.13	0.0	0.0	952.48	3.77	1.14	0.0	953.62	-0.90	0.0
0.300	359.00	940.40	6.13	0.0	0.0	956.34	3.86	1.05	0.0	957.53	2.61	0.0
0.310	1.00	940.40	0.0	945.70	947.90	953.63	0.0	0.34	0.0	954.03	0.0	0.0
0.310	1.00	940.10	0.0	949.70	947.90	954.40	0.56	0.18	0.56	954.63	0.60	6.40
0.310	1.00	940.40	0.0	945.70	947.90	948.71	-5.68	0.00	0.0	949.23	-4.45	0.0
0.310	1.00	940.40	0.0	945.70	947.90	952.75	4.04	0.27	0.0	953.11	-0.92	0.0
0.310	1.00	940.40	0.0	945.70	947.50	956.49	3.74	0.15	0.0	956.58	2.25	0.0
0.320	20.00	940.40	0.0	945.70	947.90	953.93	0.0	0.07	0.0	954.09	0.0	0.0
0.320	20.00	940.40	0.0	945.70	947.90	954.48	0.58	0.09	0.58	954.70	0.61	6.40
0.320	20.00	940.40	0.0	945.70	947.90	948.87	-5.61	0.16	0.0	949.70	-4.38	0.0
0.320	20.00	940.40	0.0	945.70	947.90	952.91	4.03	0.16	0.0	953.22	-0.87	0.0
0.320	20.00	940.40	0.0	945.70	947.50	956.51	3.60	0.02	0.0	956.60	2.51	0.0
0.330	1.00	940.40	0.0	0.0	0.0	953.65	0.0	-0.04	0.0	954.15	0.0	0.0
0.330	1.00	940.40	0.0	0.0	0.0	954.45	0.60	-0.03	0.66	954.83	0.64	6.40
0.330	1.00	940.40	0.0	0.0	0.0	949.29	-5.16	0.42	0.0	949.65	-4.33	0.0
0.330	1.00	940.40	0.0	0.0	0.0	952.87	3.58	-0.05	0.0	953.30	-0.65	0.0
0.330	1.00	940.40	0.0	0.0	0.0	956.48	3.61	-0.07	0.0	956.60	2.57	0.0
0.350	50.00	941.10	14.00	0.0	0.0	954.16	0.0	[illegible]	0.0	954.31	0.0	0.0
0.350	50.00	941.10	14.00	0.0	0.0	954.75	0.59	[illegible]	0.59	954.90	0.64	12.40
0.350	50.00	941.10	14.00	0.0	0.0	949.48	-5.27	0.19	0.0	949.57	[illegible]	0.0
0.350	50.00	941.10	14.00	0.0	0.0	953.33	3.85	0.43	0.0	953.47	-0.84	0.0
0.350	50.00	941.10	14.00	0.0	0.0	956.52	3.27	0.69	0.0	956.70	2.39	0.0
0.400	342.00	941.30	0.58	0.0	0.0	954.40	0.0	0.25	0.0	954.46	0.0	0.0
0.400	342.00	941.30	0.58	0.0	0.0	954.96	0.55	0.21	0.55	955.17	0.70	30.40
0.400	342.00	941.30	0.58	0.0	0.0	950.36	-4.60	0.08	0.0	950.48	-3.55	0.0
0.400	342.00	941.30	0.58	0.0	0.0	953.58	3.22	0.27	0.0	953.84	-0.63	0.0
0.400	342.00	941.30	0.58	0.0	0.0	956.75	3.17	0.17	0.0	956.92	2.35	0.0
0.410	1.00	941.30	0.0	945.80	944.80	954.44	0.0	0.04	0.0	954.49	0.0	0.0
0.410	1.00	941.30	0.0	945.80	944.80	955.06	0.62	0.10	0.62	955.21	0.72	35.40
0.410	1.00	941.30	0.0	945.80	944.80	950.45	-4.61	0.10	0.0	950.71	-3.51	0.0
0.410	1.00	941.30	0.0	945.80	944.80	953.62	3.16	0.04	0.0	953.66	-0.83	0.0
0.410	1.00	941.30	0.0	945.80	944.80	956.78	3.17	0.04	0.0	956.84	2.35	0.0
0.420	11.00	941.30	0.0	945.80	944.80	954.45	0.0	0.00	0.0	954.49	0.0	0.0
0.420	11.00	941.30	0.0	945.80	944.80	955.07	0.62	0.01	0.62	955.22	0.72	35.40
0.420	11.00	941.30	0.0	945.80	944.80	950.46	-4.61	0.01	0.0	950.53	-3.57	0.0
0.420	11.00	941.30	0.0	945.80	944.80	953.62	3.16	0.00	0.0	953.66	-0.83	0.0
0.420	11.00	941.30	0.0	945.80	944.80	956.79	3.17	0.00	0.0	956.84	2.35	0.0

SECNO	XLCH	ELMIN	K*CHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
0.430	1.00	941.30	0.0	0.0	0.0	954.44	0.0	-0.01	0.0	954.51	0.0	0.0
0.430	1.00	941.30	0.0	0.0	0.0	955.05	0.61	-0.02	0.61	955.20	0.73	36.40
0.430	1.00	941.30	0.0	0.0	0.0	950.43	-4.61	-0.02	0.0	950.57	-3.95	0.0

0.420	11.00	941.30	0.0	945.80	944.80	955.27	0.22	0.01	[illegible]	955.22	0.72	55.40
0.420	11.00	941.30	0.0	945.80	944.80	950.46	-4.61	0.01	0.0	950.53	-3.57	0.0
0.420	11.00	941.30	0.0	945.80	944.80	953.62	-3.16	0.00	0.0	955.60	-0.63	0.0
0.420	11.00	941.30	0.0	945.80	944.80	956.79	2.17	0.00	0.0	956.84	2.25	0.0

	SECNO	XLCH	ELMIN	K*CHSL	ELTRD	ELLC	CHSEL	DIF*SP	DIF*SX	DIFKWS	EG	DIFEG	INPUT E	
	0.430	1.00	941.30	0.0	0.0	0.0	954.44	0.0	-0.01	0.0	954.51	0.0	0.0	
	0.430	1.00	941.30	0.0	0.0	0.0	955.05	0.61	-0.02	0.61	955.28	0.75	20.40	
	0.430	1.00	941.30	0.0	0.0	0.0	950.45	-4.61	-0.02	0.0	950.57	-3.95	0.0	
	0.430	1.00	941.30	0.0	0.0	0.0	955.61	3.16	-0.01	0.0	955.60	-0.63	0.0	
	0.430	1.00	941.30	0.0	0.0	0.0	956.78	3.17	-0.01	0.0	956.80	2.25	0.0	
A	1.000	819.00	941.70	0.49	0.0	0.0	954.66	0.0	0.24	0.0	954.71	0.0	0.0	A
	1.000	819.00	941.70	0.45	0.0	0.0	955.51	0.85	0.46	0.83	955.56	0.85	12.40	
	1.000	819.00	941.70	0.49	0.0	0.0	950.55	-4.06	0.56	0.0	951.02	-3.69	0.0	
	1.000	819.00	941.70	0.49	0.0	0.0	953.05	2.50	0.24	0.0	953.80	-0.63	0.0	
	1.000	819.00	941.70	0.45	0.0	0.0	957.66	3.15	0.22	0.0	957.03	2.32	0.0	
B	2.000	760.00	943.40	2.24	0.0	0.0	954.93	0.0	0.25	0.0	955.02	0.0	0.0	B
	2.000	760.00	943.40	2.24	0.0	0.0	955.40	0.67	0.25	0.67	955.51	0.65	5.40	
	2.000	760.00	943.40	2.24	0.0	0.0	951.55	-4.21	0.04	0.0	951.82	-3.20	0.0	
	2.000	760.00	943.40	2.24	0.0	0.0	954.11	2.52	0.20	0.0	954.21	-0.81	0.0	
	2.000	760.00	943.40	2.24	0.0	0.0	957.19	3.08	0.19	0.0	957.28	2.25	0.0	
	2.100	802.00	944.40	1.25	0.0	0.0	955.82	0.0	0.09	0.0	956.91	0.0	0.0	
	2.100	802.00	944.40	1.25	0.0	0.0	956.79	0.96	0.99	0.58	957.65	0.78	8.40	
	2.100	802.00	944.40	1.25	0.0	0.0	952.76	-3.04	2.27	0.0	954.15	-2.76	0.0	
	2.100	802.00	944.40	1.25	0.0	0.0	955.21	1.45	1.10	0.0	956.60	-0.65	0.0	
	2.100	802.00	944.40	1.25	0.0	0.0	957.86	2.65	0.07	0.0	956.62	1.71	0.0	
	2.110	1.00	944.40	0.0	958.80	958.00	955.82	0.0	0.01	0.0	956.92	0.0	0.0	
	2.110	1.00	944.40	0.0	958.80	958.00	956.78	0.56	-0.01	0.56	957.30	0.75	5.10	
	2.110	1.00	944.40	0.0	958.80	958.00	953.76	-3.02	0.00	0.0	954.10	-2.76	0.0	
	2.110	1.00	944.40	0.0	958.80	958.00	955.21	1.45	0.00	0.0	956.06	-0.65	0.0	
	2.110	1.00	944.40	0.0	958.80	958.00	958.11	2.90	0.25	0.0	958.65	1.74	0.0	
	2.120	14.00	944.40	0.0	958.80	958.00	955.50	0.0	0.14	0.0	957.02	0.0	0.0	
	2.120	14.00	944.40	0.0	958.80	958.00	956.50	0.94	0.12	0.94	957.80	0.78	5.10	
	2.120	14.00	944.40	0.0	958.80	958.00	953.81	-3.09	0.04	0.0	954.20	-2.82	0.0	
	2.120	14.00	944.40	0.0	958.80	958.00	955.32	1.51	0.10	0.0	956.14	-0.82	0.0	
	2.120	14.00	944.40	0.0	958.80	958.00	958.31	3.00	0.20	0.0	958.00	1.78	0.0	
	2.130	1.00	944.40	0.0	0.0	0.0	955.97	0.0	0.01	0.0	957.01	0.0	0.0	
	2.130	1.00	944.40	0.0	0.0	0.0	956.97	1.00	0.07	1.00	957.85	0.81	8.40	
	2.130	1.00	944.40	0.0	0.0	0.0	953.81	-3.16	0.00	0.0	954.00	-2.85	0.0	
	2.130	1.00	944.40	0.0	0.0	0.0	955.32	1.51	0.01	0.0	956.15	-0.88	0.0	
	2.130	1.00	944.40	0.0	0.0	0.0	958.32	3.00	0.00	0.0	958.54	1.52	0.0	
	2.150	50.00	944.70	6.00	0.0	0.0	956.80	0.0	0.93	0.0	957.28	0.0	0.0	
	2.150	50.00	944.70	6.00	0.0	0.0	957.07	0.21	0.76	0.81	958.08	0.80	10.40	
	2.150	50.00	944.70	6.00	0.0	0.0	953.93	-3.72	0.14	0.0	954.33	-2.94	0.0	
	2.150	50.00	944.70	6.00	0.0	0.0	955.55	1.59	0.62	0.0	956.37	-0.51	0.0	
	2.150	50.00	944.70	6.00	0.0	0.0	958.07	2.73	0.35	0.0	959.12	1.84	0.0	
C	3.000	807.00	946.00	1.61	0.0	0.0	958.69	0.0	1.82	0.0	959.15	0.0	0.0	C
	3.000	807.00	946.00	1.61	0.0	0.0	959.83	0.94	1.45	0.94	960.15	0.55	5.40	
	3.000	807.00	946.00	1.61	0.0	0.0	955.76	-3.65	1.82	0.0	956.07	-3.12	0.0	
	3.000	807.00	946.00	1.61	0.0	0.0	957.83	2.05	1.58	0.0	958.27	-0.92	0.0	
	3.000	807.00	946.00	1.61	0.0	0.0	960.54	2.71	1.87	0.0	961.21	2.02	0.0	

SECNO	XLCH	ELMIN	K*CHSL	ELTRO	ELLC	CHSEL	DIFHSP	DIFHSX	DIFHHS	EG	DIFEG	INPLT E	
4.000	895.00	949.70	4.13	0.0	0.0	960.62	0.0	1.93	0.0	960.55	0.0	0.0	D
4.000	895.00	949.70	4.13	0.0	0.0	961.37	0.74	1.74	0.74	961.74	0.19	0.74	
4.000	895.00	949.70	4.13	0.0	0.0	957.47	-3.50	1.00	0.0	957.72	-3.42	0.0	
4.000	895.00	949.70	4.13	0.0	0.0	959.70	2.24	1.87	0.0	960.01	-0.54	0.0	
4.000	895.00	949.70	4.13	0.0	0.0	962.68	2.98	2.14	0.0	963.03	2.82	0.0	
4.100	792.00	951.10	1.77	0.0	0.0	962.24	0.0	1.86	0.0	962.91	0.0	0.0	
4.100	792.00	951.10	1.77	0.0	0.0	962.89	0.65	1.91	0.65	963.48	0.57	0.74	
4.100	792.00	951.10	1.77	0.0	0.0	959.05	-3.84	1.59	0.0	959.33	-3.20	0.0	
4.100	792.00	951.10	1.77	0.0	0.0	961.33	2.28	1.83	0.0	961.87	-1.04	0.0	
4.100	792.00	951.10	1.77	0.0	0.0	964.23	2.89	1.93	0.0	964.53	2.65	0.0	
4.110	1.00	951.10	0.0	962.60	962.40	962.25	0.0	0.00	0.0	962.91	0.0	0.0	
4.110	1.00	951.10	0.0	963.60	962.93	962.86	0.61	-0.03	0.61	963.21	0.29	0.10	
4.110	1.00	951.10	0.0	963.60	962.40	959.06	-3.80	0.00	0.0	959.33	-3.20	0.0	
4.110	1.00	951.10	0.0	963.60	962.40	961.34	2.28	0.00	0.0	961.88	-1.04	0.0	
4.110	1.00	951.10	0.0	963.60	962.40	964.22	2.89	-0.00	0.0	964.53	2.65	0.0	
4.120	33.00	951.10	0.0	963.60	962.40	962.37	0.0	0.15	0.0	963.02	0.0	0.0	
4.120	33.00	951.10	0.0	963.60	962.40	963.07	0.70	0.22	0.70	963.12	0.10	0.10	
4.120	33.00	951.10	0.0	963.60	962.40	959.13	-3.94	0.07	0.0	959.42	-3.66	0.0	
4.120	33.00	951.10	0.0	963.60	962.40	961.45	2.31	0.11	0.0	961.56	-1.85	0.0	
4.120	33.00	951.10	0.0	963.60	962.40	964.72	3.27	0.45	0.0	965.23	3.21	0.0	
4.130	1.00	951.10	0.0	0.0	0.0	962.38	0.0	0.00	0.0	962.93	0.0	0.0	
4.130	1.00	951.10	0.0	0.0	0.0	963.17	0.79	0.07	0.79	963.23	0.31	0.10	
4.130	1.00	951.10	0.0	0.0	0.0	959.13	-4.03	0.00	0.0	959.42	-3.80	0.0	
4.130	1.00	951.10	0.0	0.0	0.0	961.45	2.32	0.00	0.0	961.56	-1.85	0.0	
4.130	1.00	951.10	0.0	0.0	0.0	964.89	3.44	-0.03	0.0	965.23	3.66	0.0	
4.150	50.00	951.40	0.00	0.0	0.0	962.61	0.0	0.24	0.0	963.17	0.0	0.0	
4.150	50.00	951.40	0.00	0.0	0.0	963.33	0.71	0.10	0.71	963.43	0.26	0.10	
4.150	50.00	951.40	0.00	0.0	0.0	959.17	-4.16	0.03	0.0	959.47	-3.96	0.0	
4.150	50.00	951.40	0.00	0.0	0.0	961.58	2.41	0.13	0.0	962.11	-1.36	0.0	
4.150	50.00	951.40	0.00	0.0	0.0	964.79	3.21	0.05	0.0	965.46	3.35	0.0	
5.000	673.00	952.60	2.08	0.0	0.0	964.42	0.0	1.81	0.0	965.00	0.0	0.0	E
5.000	673.00	952.60	2.08	0.0	0.0	964.86	0.44	1.93	0.44	965.48	0.48	1.48	
5.000	673.00	952.60	2.08	0.0	0.0	961.19	-3.67	2.02	0.0	961.61	-3.40	0.0	
5.000	673.00	952.60	2.08	0.0	0.0	963.48	2.29	1.90	0.0	964.06	-0.95	0.0	
5.000	673.00	952.60	2.08	0.0	0.0	966.49	3.01	1.73	0.0	967.15	2.11	0.0	
6.000	1300.00	956.60	2.52	0.0	0.0	967.35	0.0	2.54	0.0	967.97	0.0	0.0	F
6.000	1300.00	956.60	2.52	0.0	0.0	968.01	0.65	2.19	0.65	968.60	0.63	1.48	
6.000	1300.00	956.60	2.52	0.0	0.0	964.40	-3.61	2.21	0.0	964.96	-3.64	0.0	
6.000	1300.00	956.60	2.52	0.0	0.0	966.40	2.00	2.01	0.0	966.99	2.03	0.0	
6.000	1300.00	956.60	2.52	0.0	0.0	969.28	2.88	2.76	0.0	969.92	2.93	0.0	
7.000	905.00	958.50	2.10	0.0	0.0	968.64	0.0	1.28	0.0	969.03	0.0	0.0	G
7.000	905.00	958.50	2.10	0.0	0.0	969.31	0.67	1.50	0.67	969.71	0.68	1.48	
7.000	905.00	958.50	2.10	0.0	0.0	965.86	-3.45	1.60	0.0	966.29	-3.42	0.0	
7.000	905.00	958.50	2.10	0.0	0.0	967.85	1.99	1.80	0.0	968.04	1.75	0.0	
7.000	905.00	958.50	2.10	0.0	0.0	970.50	2.65	1.22	0.0	970.81	2.77	0.0	

SECNO	XLCH	ELMIN	K*CHSL	ELTRO	ELLC	CHSEL	DIFHSP	DIFHSX	DIFHHS	EG	DIFEG	INPLT E	
7.100	1209.00	958.70	0.17	0.0	0.0	971.45	0.0	2.82	0.0	971.81	0.0	0.0	
7.100	1209.00	958.70	0.17	0.0	0.0	972.10	0.70	2.64	0.70	972.35	0.54	0.10	
7.100	1209.00	958.70	0.17	0.0	0.0	968.64	-3.46	2.68	0.0	969.04	-3.31	0.0	
7.100	1209.00	958.70	0.17	0.0	0.0	970.43	1.79	2.83	0.0	970.83	1.79	0.0	

7.000	905.00	958.50	2.10	0.0	0.0	969.51	0.07	1.50	0.07	969.71	[illegible]	[illegible]
7.000	905.00	958.50	2.10	0.0	0.0	966.06	-3.45	1.00	0.0	966.25	-2.5[illegible]	0.0
7.000	905.00	958.50	2.10	0.0	0.0	967.85	1.79	1.36	0.0	968.04	-0.79	0.0
7.000	905.00	958.50	2.10	0.0	0.0	970.50	2.65	1.22	0.0	97[illegible]	1.[illegible]	0.0

SECNO	XECH	ELMIN	K*CHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
7.100	1209.00	958.70	0.17	0.0	0.0	971.45	0.0	2.82	0.0	971.6[illegible]	0.0	0.0
7.100	1209.00	958.70	0.17	0.0	0.0	972.16	0.70	2.64	0.70	972.35	0.72	5.16
7.100	1209.00	958.70	0.17	0.0	0.0	968.94	-3.21	2.88	0.0	969.24	-2.63	0.0
7.100	1209.00	958.70	0.17	0.0	0.0	970.[illegible]	1.79	2.85	0.0	971.13	-0.74	0.0
7.100	1209.00	958.70	0.17	0.0	0.0	973.[illegible]	2.45	2.68	0.0	973.03	1.76	0.0
7.110	1.00	958.70	0.0	566.50	967.00	971.67	0.0	0.22	0.0	971.85	0.0	0.0
7.110	1.00	958.70	0.0	566.50	567.00	972.35	0.68	0.15	0.68	972.61	0.72	5.16
7.110	1.00	958.70	0.0	565.50	567.00	968.98	-3.37	0.04	0.0	969.23	-2.64	0.0
7.110	1.00	958.70	0.0	566.50	567.00	970.92	1.94	0.18	0.0	971.19	-0.75	0.0
7.110	1.00	958.70	0.0	568.50	567.00	973.45	2.55	0.26	0.0	973.63	1.76	0.0
7.120	9.00	958.70	0.0	566.50	567.00	971.75	0.0	0.07	0.0	971.96	0.0	0.0
7.120	9.00	958.70	0.0	568.50	567.00	972.42	0.67	0.07	0.67	972.67	0.72	5.16
7.120	9.00	958.70	0.0	568.50	567.00	969.08	-3.34	0.10	0.0	969.33	-2.65	0.0
7.120	9.00	958.70	0.0	566.50	567.00	971.00	1.91	0.08	0.0	971.22	-0.74	0.0
7.120	9.00	958.70	0.0	568.[illegible]	567.00	973.51	2.51	0.06	0.0	973.71	1.75	0.0
7.130	1.00	958.70	0.0	0.0	0.0	971.75	0.0	0.00	0.0	972.11	0.0	0.0
7.130	1.00	958.70	0.0	0.0	0.0	972.42	0.68	0.00	0.68	972.82	0.71	5.16
7.130	1.00	958.70	0.0	0.0	0.0	969.09	-3.34	0.00	0.0	969.36	-2.75	0.0
7.130	1.00	958.70	0.0	0.0	0.0	971.00	1.91	0.00	0.0	971.35	-0.77	0.0
7.130	1.00	958.70	0.0	0.0	0.0	973.51	2.51	0.00	0.0	973.56	1.75	0.0
H 8.000	125.00	960.20	12.00	0.0	0.0	972.14	0.0	0.39	0.0	972.40	0.0	0.0
8.000	125.00	960.20	12.00	0.0	0.0	972.77	0.63	0.35	0.63	973.11	0.71	5.16 H
8.000	125.00	960.20	12.00	0.0	0.0	969.43	-3.34	0.34	0.0	969.51	-2.75	0.0
8.000	125.00	960.20	12.00	0.0	0.0	971.35	1.96	0.36	0.0	971.63	-0.76	0.0
8.000	125.00	960.20	12.00	0.0	0.0	973.84	2.50	0.37	0.0	974.20	1.75	0.0
I 9.000	1070.00	962.50	2.15	0.0	0.0	974.03	0.0	1.87	0.0	974.15	0.0	0.0
9.000	1070.00	962.50	2.15	0.0	0.0	974.82	0.79	2.05	0.79	975.04	0.88	10.40 I
9.000	1070.00	962.50	2.15	0.0	0.0	971.35	-3.47	1.92	0.0	971.54	-2.64	0.0
9.000	1070.00	962.50	2.15	0.0	0.0	973.27	1.92	1.88	0.0	973.43	-0.75	0.0
9.000	1070.00	962.50	2.15	0.0	0.0	975.78	2.51	1.90	0.0	975.94	1.75	0.0
9.100	158.00	963.70	0.38	0.0	0.0	974.50	0.0	0.47	0.0	974.55	0.0	0.0
9.100	158.00	963.70	0.38	0.0	0.0	975.30	0.86	0.51	0.86	975.45	0.90	10.40
9.100	158.00	963.70	0.38	0.0	0.0	971.97	-3.19	0.62	0.0	972.14	-2.45	0.0
9.100	158.00	963.70	0.38	0.0	0.0	974.77	1.90	0.50	0.0	973.67	-0.72	0.0
9.100	158.00	963.70	0.38	0.0	0.0	976.21	2.44	0.42	0.0	976.30	1.76	0.0
9.110	1.00	963.70	0.0	571.60	569.00	974.55	0.0	0.08	0.0	974.60	0.0	0.0
9.110	1.00	963.70	0.0	571.60	569.00	975.43	0.88	0.08	0.88	975.50	0.90	10.40
9.110	1.00	963.70	0.0	571.60	569.00	972.10	-3.34	0.13	0.0	972.20	-2.44	0.0
9.110	1.00	963.70	0.0	571.60	569.00	973.83	1.74	0.07	0.0	973.80	-0.72	0.0
9.110	1.00	963.70	0.0	571.60	569.60	976.25	2.41	0.04	0.0	976.30	1.76	0.0
9.120	12.00	963.70	0.0	571.60	569.00	974.60	0.0	0.04	0.0	974.64	0.0	0.0
9.120	12.00	963.70	0.0	571.60	569.00	975.48	0.88	0.05	0.88	975.53	0.90	10.40
9.120	12.00	963.70	0.0	571.60	569.00	972.15	-3.25	0.09	0.0	972.24	-2.44	0.0
9.120	12.00	963.70	0.0	571.60	569.00	973.39	1.70	0.05	0.0	973.93	-0.71	0.0
9.120	12.00	963.70	0.0	571.60	569.00	976.28	2.40	0.33	0.0	976.34	1.65	0.0

SECNO	XLCH	ELMIN	K*CHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
9.130	1.00	963.70	0.0	0.0	0.0	974.57	0.0	-0.03	0.0	974.62	0.0	0.0
9.130	1.00	963.70	0.0	0.0	0.0	975.44	0.87	-0.04	0.87	975.57	0.81	10.40
9.130	1.00	963.70	0.0	0.0	0.0	972.13	-3.31	-0.00	0.0	972.20	-2.38	0.0
9.130	1.00	963.70	0.0	0.0	0.0	973.85	1.72	-0.03	0.0	973.95	-0.71	0.0
9.130	1.00	963.70	0.0	0.0	0.0	976.26	2.41	-0.02	0.0	976.35	1.65	0.0
10.000	788.00	966.50	3.55	0.0	0.0	976.47	0.0	1.51	0.0	976.62	0.0	0.0
10.000	788.00	966.50	3.55	0.0	0.0	977.39	0.92	1.95	0.92	977.45	0.87	[illegible]
10.000	788.00	966.50	3.55	0.0	0.0	974.30	-3.09	2.17	0.0	974.34	-2.22	0.0
10.000	788.00	966.50	3.55	0.0	0.0	975.85	1.55	2.00	0.0	976.17	-0.65	0.0
10.000	788.00	966.50	3.55	0.0	0.0	977.99	2.14	1.73	0.0	978.30	1.58	0.0
10.100	1057.00	969.20	2.55	0.0	0.0	979.72	0.0	3.24	0.0	980.15	0.0	0.0
10.100	1057.00	969.20	2.55	0.0	0.0	980.34	0.62	2.54	0.62	980.80	-0.65	5.10
10.100	1057.00	969.20	2.55	0.0	0.0	976.98	-3.36	2.65	0.0	977.23	-2.92	0.0
10.100	1057.00	969.20	2.55	0.0	0.0	978.95	2.03	3.14	0.0	979.38	-0.77	0.0
10.100	1057.00	969.20	2.55	0.0	0.0	981.35	2.36	3.38	0.0	981.88	1.72	0.0
10.110	1.00	969.20	0.0	978.90	977.70	979.75	0.0	0.01	0.0	980.17	0.0	0.0
10.110	1.00	969.20	0.0	978.90	977.70	980.35	0.62	0.01	0.62	980.92	0.75	5.10
10.110	1.00	969.20	0.0	978.90	977.70	976.98	-3.35	0.00	0.0	977.24	-2.92	0.0
10.110	1.00	969.20	0.0	978.90	977.70	979.00	2.04	0.01	0.0	979.40	-0.69	0.0
10.110	1.00	969.20	0.0	978.50	977.70	981.04	2.03	0.20	0.0	982.41	1.44	0.0
10.120	23.00	969.20	0.0	978.90	977.70	980.20	0.0	0.40	0.0	980.59	0.0	0.0
10.120	23.00	969.20	0.0	978.90	977.70	980.64	0.63	0.49	0.63	981.02	0.77	5.10
10.120	23.00	969.20	0.0	978.90	977.70	977.04	-3.20	0.00	0.0	977.31	-3.23	0.0
10.120	23.00	969.20	0.0	978.90	977.70	979.42	2.38	0.40	0.0	979.79	-0.75	0.0
10.120	23.00	969.20	0.0	978.90	977.70	981.96	2.54	0.33	0.0	982.27	1.75	0.0
10.130	1.00	969.20	0.0	0.0	0.0	980.20	0.0	-0.00	0.0	980.30	0.0	0.0
10.130	1.00	969.20	0.0	0.0	0.0	980.90	0.70	0.12	0.70	981.35	0.75	5.10
10.130	1.00	969.20	0.0	0.0	0.0	977.04	-3.91	0.00	0.0	977.31	-3.24	0.0
10.130	1.00	969.20	0.0	0.0	0.0	979.50	2.45	0.00	0.0	979.82	-0.74	0.0
10.130	1.00	969.20	0.0	0.0	0.0	981.91	2.41	-0.05	0.0	982.35	1.75	0.0
10.150	50.00	969.00	-3.55	0.0	0.0	980.23	0.0	0.04	0.0	980.65	0.0	0.0
10.150	50.00	969.00	-3.55	0.0	0.0	980.99	0.75	0.03	0.75	981.72	0.75	3.40
10.150	50.00	969.00	-3.55	0.0	0.0	977.15	-3.84	0.10	0.0	977.65	-2.25	0.0
10.150	50.00	969.00	-3.55	0.0	0.0	979.55	2.40	0.03	0.0	980.23	-0.80	0.0
10.150	50.00	969.00	-3.55	0.0	0.0	981.90	2.34	-0.01	0.0	982.55	1.42	0.0
10.200	1012.00	973.30	4.25	0.0	0.0	984.39	0.0	4.15	0.0	984.65	0.0	0.0
10.200	1012.00	973.30	4.25	0.0	0.0	984.73	0.34	3.74	0.34	985.10	0.31	10.40
10.200	1012.00	973.30	4.25	0.0	0.0	980.85	-3.87	3.71	0.0	981.10	-3.70	0.0
10.200	1012.00	973.30	4.25	0.0	0.0	983.30	2.55	3.83	0.0	983.77	-1.60	0.0
10.200	1012.00	973.30	4.25	0.0	0.0	986.74	3.36	4.04	0.0	987.42	2.57	0.0
10.210	1.00	973.30	0.0	994.40	986.70	984.39	0.0	0.00	0.0	984.60	0.0	0.0
10.210	1.00	973.30	0.0	994.40	986.70	984.73	0.34	0.00	0.34	985.10	0.31	10.40
10.210	1.00	973.30	0.0	994.40	986.70	980.85	-3.87	0.00	0.0	981.10	-3.70	0.0
10.210	1.00	973.30	0.0	994.40	986.70	983.30	2.53	0.00	0.0	983.77	-1.60	0.0
10.210	1.00	973.30	0.0	994.40	986.70	986.74	3.35	0.00	0.0	987.43	2.57	0.0

SECNO	XLCH	ELMIN	K*CHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
10.220	10.00	973.30	0.0	994.40	986.70	984.46	0.0	[illegible]	0.0	984.88	0.0	0.0
10.220	10.00	973.30	0.0	994.40	986.70	984.75	0.33	0.03	0.33	985.17	0.31	10.40
10.220	10.00	973.30	0.0	994.40	986.70	980.88	-3.88	0.02	0.0	981.18	-3.70	0.0
10.220	10.00	973.30	0.0	994.40	986.70	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

10.210	1.00	973.30	0.0	994.40	986.70	984.23	0.24	0.00	0.34	985.16	-0.31	10.40
10.210	1.00	973.30	0.0	994.40	986.70	980.65	-3.67	0.00	0.0	981.16	-3.76	0.0
10.210	1.00	973.30	0.0	994.40	986.70	983.30	2.53	0.00	0.0	983.71	-1.66	0.0
10.210	1.00	973.30	0.0	994.40	986.70	986.74	3.35	0.00	0.0	987.43	2.57	0.0

SECNO.	XLCH.	ELMIN	K*CHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
10.220	10.00	973.30	0.0	994.40	986.70	984.42	0.0	0.03	0.0	984.68	0.0	0.0
10.220	10.00	973.30	0.0	994.40	986.70	984.75	0.33	0.02	0.33	985.17	0.31	10.40
10.220	10.00	973.30	0.0	994.40	986.70	980.88	-3.68	0.02	0.0	981.12	-3.70	0.0
10.220	10.00	973.30	0.0	994.40	985.70	983.41	2.55	0.03	0.0	983.60	-1.62	0.0
10.220	10.00	973.30	0.0	994.40	986.70	986.80	3.39	0.07	0.0	987.44	2.61	0.0
10.230	1.00	973.30	0.0	0.0	0.0	984.42	0.0	0.00	0.0	984.69	0.0	0.0
10.230	1.00	973.30	0.0	0.0	0.0	984.76	0.33	0.00	0.33	985.35	0.31	10.40
10.230	1.00	973.30	0.0	0.0	0.0	980.88	-3.88	0.00	0.0	981.12	-3.70	0.0
10.230	1.00	973.30	0.0	0.0	0.0	983.41	2.53	0.00	0.0	983.60	-1.62	0.0
10.230	1.00	973.30	0.0	0.0	0.0	986.82	3.41	0.02	0.0	987.50	2.61	0.0
10.250	50.00	973.60	6.00	0.0	0.0	984.62	0.0	0.20	0.0	985.01	0.0	0.0
10.250	50.00	973.60	6.00	0.0	0.0	984.87	0.25	0.11	0.25	985.33	0.31	10.40
10.250	50.00	973.60	6.00	0.0	0.0	980.97	-3.90	0.09	0.0	981.20	-3.75	0.0
10.250	50.00	973.60	6.00	0.0	0.0	983.56	2.59	0.15	0.0	983.92	-1.65	0.0
10.250	50.00	973.60	6.00	0.0	0.0	987.18	3.62	0.38	0.0	987.64	2.62	0.0
11.000	859.00	976.50	3.38	0.0	0.0	986.77	0.0	2.15	0.0	987.82	0.0	0.0
11.000	859.00	976.50	3.38	0.0	0.0	987.47	0.71	2.01	0.71	987.60	0.06	5.40
11.000	859.00	976.50	3.38	0.0	0.0	983.86	-3.61	2.50	0.0	984.22	-2.64	0.0
11.000	859.00	976.50	3.38	0.0	0.0	985.87	2.00	2.31	0.0	986.25	-0.66	0.0
11.000	859.00	976.50	3.38	0.0	0.0	989.08	3.21	1.90	0.0	989.34	2.28	0.0
12.000	1000.00	978.90	2.40	0.0	0.0	985.21	0.0	2.04	0.0	985.93	0.0	0.0
12.000	1000.00	978.90	2.40	0.0	0.0	985.74	0.53	2.27	0.53	985.87	0.05	7.40
12.000	1000.00	978.90	2.40	0.0	0.0	982.53	-3.21	2.07	0.0	982.03	-3.86	0.0
12.000	1000.00	978.90	2.40	0.0	0.0	984.10	1.57	2.23	0.0	984.22	-0.72	0.0
12.000	1000.00	978.90	2.40	0.0	0.0	986.70	2.61	1.03	0.0	988.02	1.65	0.0
12.100	961.00	980.00	1.14	0.0	0.0	990.50	0.0	1.69	0.0	991.33	0.0	0.0
12.100	961.00	980.00	1.14	0.0	0.0	991.33	0.82	1.59	0.82	992.02	0.70	10.40
12.100	961.00	980.00	1.14	0.0	0.0	988.23	-3.09	1.40	0.0	988.33	-2.70	0.0
12.100	961.00	980.00	1.14	0.0	0.0	989.34	1.01	1.74	0.0	990.07	-0.60	0.0
12.100	961.00	980.00	1.14	0.0	0.0	991.96	2.62	1.20	0.0	993.31	1.96	0.0
12.110	1.00	980.00	0.0	992.50	989.30	990.51	0.0	0.01	0.0	991.53	0.0	0.0
12.110	1.00	980.00	0.0	992.50	989.30	991.33	0.82	0.01	0.82	992.42	0.82	5.10
12.110	1.00	980.00	0.0	992.50	989.30	988.24	-3.10	0.00	0.0	988.33	-3.04	0.0
12.110	1.00	980.00	0.0	992.50	989.30	989.85	1.61	0.01	0.0	990.50	-1.02	0.0
12.110	1.00	980.00	0.0	992.50	989.30	991.98	2.13	0.01	0.0	994.24	2.09	0.0
12.120	16.00	980.00	0.0	992.50	989.30	990.76	0.0	0.25	0.0	991.05	0.0	0.0
12.120	16.00	980.00	0.0	992.50	989.30	991.54	0.63	0.20	0.63	992.60	0.83	5.10
12.120	16.00	980.00	0.0	992.50	989.30	988.26	-3.31	0.05	0.0	988.59	-3.22	0.0
12.120	16.00	980.00	0.0	992.50	989.30	990.01	1.73	0.16	0.0	990.73	-1.12	0.0
12.120	16.00	980.00	0.0	992.50	989.30	993.94	3.94	0.01	0.0	994.04	2.59	0.0
12.130	1.00	980.00	0.0	0.0	0.0	991.17	0.0	0.41	0.0	991.57	0.0	0.0
12.130	1.00	980.00	0.0	0.0	0.0	992.13	0.96	0.54	0.56	992.73	0.64	10.40
12.130	1.00	980.00	0.0	0.0	0.0	988.29	-3.83	0.00	0.0	988.39	-3.30	0.0
12.130	1.00	980.00	0.0	0.0	0.0	990.16	1.87	0.15	0.0	990.75	-1.15	0.0
12.130	1.00	980.00	0.0	0.0	0.0	994.19	4.04	0.20	0.0	994.06	2.51	0.0

SECNO	XECH	ELMIN	XOCHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT
12.150	50.00	979.60	-8.01	0.0	0.0	991.35	0.0	0.16	0.0	992.47	0.0	0.0
12.150	50.00	979.60	-8.01	0.0	0.0	992.26	0.91	0.13	0.51	99[illegible]	[illegible]	1.40
12.150	50.00	979.60	-8.01	0.0	0.0	988.39	-3.67	0.11	0.0	989.00	[illegible]	0.0
12.150	50.00	979.60	-8.01	0.0	0.0	990.32	1.93	0.16	0.0	991.36	-1.11	0.0
12.150	50.00	979.60	-8.01	0.0	0.0	994.34	4.02	0.14	0.0	995.24	2.77	0.0
13.000	806.00	983.80	5.21	0.0	0.0	994.50	0.0	3.34	0.0	995.17	0.0	0.0
13.000	806.00	983.80	5.21	0.0	0.0	995.50	0.69	3.32	0.69	995.95	0.78	10.40
13.000	806.00	983.80	5.21	0.0	0.0	991.71	-3.87	3.32	0.0	991.93	-3.24	0.0
13.000	806.00	983.80	5.21	0.0	0.0	993.92	2.21	3.00	0.0	994.17	-1.00	0.0
13.000	806.00	983.80	5.21	0.0	0.0	997.13	3.21	2.74	0.0	997.44	2.27	0.0
14.000	895.00	985.70	2.12	0.0	0.0	996.70	0.0	1.60	0.0	996.55	0.0	0.0
14.000	895.00	985.70	2.12	0.0	0.0	997.63	0.93	2.05	0.93	997.98	1.42	10.40
14.000	895.00	985.70	2.12	0.0	0.0	993.87	-3.76	[illegible]	0.0	994.12	-2.84	0.0
14.000	895.00	985.70	2.12	0.0	0.0	995.30	1.43	1.88	0.0	996.05	-0.56	0.0
14.000	895.00	985.70	2.12	0.0	0.0	998.79	2.99	1.60	0.0	999.05	2.10	0.0
15.000	690.00	986.60	1.30	0.0	0.0	996.01	0.0	1.31	0.0	996.24	0.0	0.0
15.000	690.00	986.60	1.30	0.0	0.0	997.03	1.03	1.40	1.03	997.27	1.04	7.40
15.000	690.00	986.60	1.30	0.0	0.0	993.31	-3.72	1.44	0.0	993.46	-2.75	0.0
15.000	690.00	986.60	1.30	0.0	0.0	997.16	1.65	1.36	0.0	997.37	-0.67	0.0
15.000	690.00	986.60	1.30	0.0	0.0	999.58	2.52	1.23	0.0	1000.24	2.03	0.0

	1.000	50.000	51.000	52.000	3.000	61.000	64.000	200.000	0.0	0.0
QT	9.000	1920.000	3400.000	4200.000	6300.000	4200.000	4200.000	4200.000	4200.000	4200.000
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	1.400	0.0	0.0	0.0
X1	0.010	3.000	1970.000	2055.000	300.000	300.000	300.000	0.0	0.0	0.0
GR	960.000	950.000	948.900	1970.000	935.600	1990.000	935.600	2020.000	947.300	2055.000
GR	948.000	2135.000	950.000	2140.000	960.000	2150.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.040	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2024.000
X1	0.100	9.000	1975.000	2024.000	422.000	422.000	422.000	0.0	0.0	0.0
GR	980.000	1900.000	950.000	1900.000	951.500	1975.000	938.100	1975.000	938.100	2024.000
GR	951.500	2024.000	951.800	2095.000	949.100	2170.000	960.000	2440.000	0.0	0.0
NC	0.0	0.0	0.0	0.800	1.000	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2024.000
X1	0.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
BT	4.000	1975.000	951.500	0.0	1975.000	953.800	947.600	2024.000	953.800	947.600
BT	2024.000	951.500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.500	0.700	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2024.000
X1	0.120	0.0	0.0	0.0	14.000	14.000	14.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2024.000
X1	0.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	951.500	951.500	0.0
NC	0.0	0.0	0.0	0.800	1.000	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1976.000	2024.000
X1	0.150	21.000	1976.000	2024.000	41.000	41.000	41.000	0.0	0.0	0.0

Future Conditions
Conditions after Completion of COE Proposed Unit 2B

This information should be retained on file and is to be used to revise the flood insurance study for this community after the COE proposed channelization project, Unit 2B, is completed.

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 HEC2-RELEASE DATED NOV 76-UPDATED AUG1977
 ERROR CORR    01.02
 MODIFICATION    50,51,52,53; MBJ UPDATE MADE 16 JAN 3 PM
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T1    35-MPA FLS (CONTRACT H-4553)
T2    CHARTIERS TOWNSHIP, WASHINGTON CO.
T3    100-YR FLOOD-29-DCK-CHARTIERS RUN  proposed channel

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    NVINS     Q         WSEL      FQ
        0.        4.        3.        0.   0.002500       0.0       0.0       0.   960.000       0.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH        FN       LOC       IBW      CHNIM     ITRACE
    1.000       0.0    -1.000       0.0       0.0       0.0       0.0       0.0       0.0       0.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
   33.000    43.000     1.000     8.000    39.000    65.000    53.000    27.000    21.000    22.000

   29.000    54.000     4.000     0.0      38.000    59.000    42.000    33.000    40.000    41.000

    1.000    50.000    51.000    52.000     3.000    61.000    64.000   200.000     0.0       0.0

QT      9.000  1920.000  3400.000  4200.000  6300.000  4200.000  4200.000  4200.000  4200.000  4200.000
NC      0.0       0.0       0.0       0.100     0.300     0.0       0.0       0.0       0.0       0.0
NT      0.100     0.100     0.030     0.0       0.0       0.0       0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       0.0       1.400     0.0       0.0       0.0

X1      0.010     8.000  1970.000  2055.000   300.000   300.000   300.000     0.0       0.0       0.0
GR    960.000   950.000   948.900  1970.000   935.600  1990.000   935.600  2020.000   947.300  2055.000
GR    948.000  2135.000   950.000  2140.000   960.000  2150.000     0.0       0.0       0.0       0.0
NC      0.100     0.100     0.040     0.0       0.0       0.0       0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       0.0       9.100     0.0    1975.000  2024.000

X1      0.100     9.000  1975.000  2024.000   422.000   422.000   422.000     0.0       0.0       0.0
GR    980.000  1901.000   950.000  1900.000   951.500  1975.000   938.100  1975.000   938.100  2024.000
GR    951.500  2024.000   951.800  2095.000   949.100  2176.000   960.300  2440.000     0.0       0.0
NC      0.0       0.0       0.0       0.800     1.000     0.0       0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       0.0       9.100     0.0    1975.000  2024.000

X1      0.110     0.0       0.0       0.0       1.000     1.000     1.000     0.0       0.0       0.0
BT      4.000  1975.000   951.500     0.0    1975.000   953.800   947.000  2024.000   953.800   947.000
BT   2024.000   951.500     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
NC      0.0       0.0       0.0       0.500     0.700     0.0       0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       0.0       9.100     0.0    1975.000  2024.000

X1      0.120     0.0       0.0       0.0      14.000    14.000    14.000     0.0       0.0       0.0
X2      0.0       0.0       0.0       0.0       0.0       0.0       1.000     0.0       0.0       0.0
NC      0.0       0.0       0.0       0.100     0.300     0.0       0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       0.0       9.100     0.0    1975.000  2024.000

X1      0.130     0.0       0.0       0.0       1.000     1.000     1.000     0.0       0.0       0.0
X3     10.000     0.0       0.0       0.0       0.0       0.0       0.0     951.500   951.500     0.0
NC      0.0       0.0       0.0       0.800     1.000     0.0       0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       0.0       9.100     0.0    1976.000  2024.000

X1      0.150    21.000  1970.000  2024.000    41.000    41.000    41.000     0.0       0.0       0.0
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NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2024.000
X1	0.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	951.500	951.500	0.0
NC	0.0	0.0	0.0	0.800	1.000	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1976.000	2024.000
Y1	0.150	21.000	1976.000	2024.000	41.000	41.000	41.000	0.0	0.0	0.0
GR	959.800	1185.000	957.900	1255.000	955.800	1378.000	955.300	1400.000	952.400	1500.000
GR	950.300	1600.000	948.300	1700.000	947.500	1800.000	949.000	1897.000	950.300	1954.000
GR	940.400	1976.000	939.500	1988.000	938.500	2000.000	938.500	2004.000	939.000	2012.000
GR	942.100	2024.000	951.700	2046.000	951.800	2086.000	949.100	2269.000	955.300	2393.000
GR	960.600	2440.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1976.000	2024.000
Y1	0.160	21.000	1976.000	2024.000	25.000	25.000	25.000	0.0	0.0	0.0
GR	959.800	1185.000	957.900	1255.000	955.800	1378.000	955.300	1400.000	952.400	1500.000
GR	950.300	1600.000	948.300	1700.000	947.500	1800.000	949.000	1897.000	950.300	1954.000
GR	940.500	1976.000	939.600	1988.000	938.700	2000.000	938.700	2004.000	940.000	2012.000
GR	942.200	2024.000	951.700	2046.000	951.800	2086.000	949.100	2269.000	955.300	2393.000
GR	960.600	2440.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	3.400	0.0	0.0	0.0
Y1	0.200	21.000	1976.000	2024.000	25.000	25.000	25.000	0.0	0.0	0.0
Y3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	947.500	947.500	0.0
GR	959.800	1185.000	957.900	1255.000	955.800	1378.000	955.300	1400.000	952.400	1500.000
GR	950.300	1600.000	948.300	1700.000	947.500	1800.000	949.000	1897.000	950.300	1954.000
GR	940.700	1976.000	939.800	1988.000	938.800	2000.000	938.800	2004.000	940.200	2012.000
GR	942.400	2024.000	951.700	2046.000	951.800	2086.000	949.100	2269.000	955.300	2393.000
GR	960.600	2440.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	20.400	0.0	0.0	0.0
Y1	0.210	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
Y3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	947.500	947.500	0.0
BT	9.000	1954.000	950.300	0.0	1954.000	953.800	0.0	1976.000	954.100	940.700
BT	1988.000	954.300	946.900	2030.000	954.500	948.600	2012.000	954.700	947.300	2024.000
BT	954.900	942.400	2046.000	955.200	0.0	2046.000	951.700	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	45.400	0.0	0.0	0.0
Y1	0.220	0.0	0.0	0.0	49.000	49.000	49.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
Y3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	949.000	949.000	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	19.400	0.0	0.0	0.0
X1	0.230	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
Y3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	950.500	950.500	0.0
NC	0.0	0.0	0.0	0.800	1.000	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	2.400	0.0	0.0	0.0
X1	0.250	10.000	1994.000	2017.000	50.000	50.000	50.000	0.0	0.0	0.0
Y4	1.000	948.700	1980.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GR	960.000	1500.000	939.800	1994.000	939.200	1995.000	938.400	1997.000	938.200	2000.000
GR	939.200	2011.000	949.400	2017.000	947.100	2030.000	950.700	2043.000	960.000	2440.000
NC	0.100	0.060	0.035	0.0	0.0	0.0	0.0	0.0	0.0	0.0
QT	9.000	1640.000	2890.000	3510.000	5250.000	3510.000	3510.000	3510.000	3510.000	3510.000
NC	0.0	0.0	0.0	0.500	0.700	0.0	0.0	0.0	0.0	0.0

ET	0.0	0.0	0.0	0.0	0.0	0.0	5.400	0.0	0.0	0.0
X1	0.300	12.000	1982.000	2018.000	375.000	325.000	359.000	0.0	0.0	0.0
X4	1.000	954.000	1930.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GR	960.000	1500.000	952.000	1940.000	952.000	1960.000	951.000	1965.000	949.700	1982.000
GR	943.900	1982.000	940.400	1999.000	940.400	2006.000	943.100	2018.000	949.700	2018.000
GR	953.000	2300.000	960.000	2400.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.500	1.000	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0
X1	0.310	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X4	1.000	954.000	1930.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BT	3.000	1982.000	949.700	947.900	2018.000	949.700	947.900	2018.000	949.700	947.900
NC	0.0	0.0	0.0	0.500	0.700	0.0	0.0	0.0	0.0	0.0
X1	0.320	0.0	0.0	0.0	20.000	20.000	20.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X4	1.000	954.000	1930.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	7.400	0.0	0.0	0.0
X1	0.330	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X4	1.000	954.000	1930.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	13.400	0.0	0.0	0.0
X1	0.350	21.000	1985.000	2015.000	50.000	50.000	50.000	0.0	0.0	0.0
GR	961.600	1880.000	957.600	1923.000	954.700	1941.000	953.300	1950.500	952.700	1971.000
GR	943.900	1985.000	942.700	1991.000	941.800	1992.000	941.200	1996.000	941.100	2003.000
GR	941.400	2009.000	942.800	2010.000	943.600	2015.000	946.800	2027.000	949.300	2105.000
GR	950.900	2200.000	951.100	2270.000	952.800	2300.000	953.600	2326.000	957.200	2360.000
GR	962.000	2369.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	35.400	0.0	0.0	0.0
X1	0.400	15.000	1989.000	2011.000	400.000	300.000	342.000	0.0	0.0	0.0
GR	962.700	1819.000	949.300	1842.000	948.300	1893.000	948.200	1936.000	945.800	1976.000
GR	945.800	1989.000	941.300	1989.000	941.200	2005.000	944.800	2011.000	945.200	2011.000
GR	945.800	2015.000	946.100	2030.000	948.800	2144.000	953.700	2169.000	960.000	2200.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	40.400	0.0	0.0	0.0
X1	0.410	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
BT	3.000	1989.000	945.800	944.800	2011.000	945.800	944.800	2011.000	945.800	944.800
X1	0.420	0.0	0.0	0.0	11.000	11.000	11.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	35.400	0.0	0.0	0.0
X1	0.430	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
QT	9.000	1640.000	2890.000	3510.000	5250.000	3510.000	3510.000	3510.000	3510.000	3510.000
NC	0.100	0.100	0.040	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	12.400	0.0	0.0	0.0
X1	1.000	22.000	1981.000	2021.000	750.000	850.000	819.000	0.0	0.0	0.0
GR	970.270	1697.000	961.900	1820.000	960.500	1838.000	955.000	1868.000	949.700	1971.000
GR	946.600	1971.000	947.100	1981.000	945.100	1988.000	942.500	1990.000	942.200	1991.000
GR	941.700	2000.000	941.900	2012.000	943.500	2013.000	947.000	2021.000	948.400	2034.000
GR	947.500	2100.000	948.900	2300.000	950.500	2500.000	954.700	2600.000	958.700	2630.000
GR	963.000	2643.000	963.500	2650.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.150	0.150	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0
X1	2.000	17.000	1980.000	2021.000	650.000	800.000	760.000	0.0	0.0	0.0
GR	963.200	1932.000	960.800	1948.000	957.600	1961.000	950.000	1980.000	946.400	1989.000
GR	944.600	1993.000	943.400	2000.000	943.600	2005.000	944.600	2007.000	947.400	2019.000
GR	949.800	2021.000	949.500	2340.000	952.500	2900.000	955.600	2542.000	962.700	2577.000
GR	972.700	2595.000	971.900	2612.000	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0

	GR	963.000	2643.000	963.500	2450.000	0.0	0.0	0.0	0.0	0.0	0.0
	NC	0.150	0.150	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0
	XI	2.000	17.000	1980.000	2021.000	650.000	800.000	760.000	0.0	0.0	0.0
	GR	983.200	1932.000	960.800	1948.000	957.600	1961.000	950.000	1980.000	946.400	1989.000
B	GR	944.600	1993.000	943.400	2000.000	943.600	2005.000	944.600	2007.000	947.400	2010.000
	GR	969.800	2021.000	949.500	2340.000	952.500	2500.000	955.600	2542.000	962.700	2577.000
	GR	972.700	2595.000	971.900	2612.000	0.0	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0
	XI	2.100	16.000	1978.000	2023.000	700.000	700.000	802.000	0.0	0.0	0.0
	X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	958.000	956.200	0.0
	GR	971.800	1928.000	962.900	1943.000	960.700	1975.000	960.600	1978.000	951.100	1978.000
	GR	944.400	1995.000	944.400	2005.000	948.700	2023.000	958.800	2023.000	958.700	2025.000
	GR	955.300	2058.000	953.700	2100.000	953.600	2158.000	956.400	2300.000	962.700	2415.000
	GR	967.000	2500.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1978.000	2023.000
	XI	2.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
	X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	958.000	956.200	0.0
	BT	3.000	1978.000	960.600	958.000	2023.000	958.800	956.200	2023.000	958.800	956.200
	NC	0.0	0.0	0.0	0.800	1.000	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1978.000	2023.000
	XI	2.120	0.0	0.0	0.0	14.000	14.000	14.000	0.0	0.0	0.0
	X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
	X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	958.000	956.200	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0
	XI	2.1	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
	X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	958.000	956.200	0.0
	NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0
	XI	2.150	12.000	1990.000	2011.000	50.000	50.000	50.000	0.0	0.0	0.0
	GR	970.300	1936.000	952.700	1966.000	946.500	1990.000	945.500	1992.000	944.700	1994.000
	GR	944.700	2000.000	945.100	2005.000	945.900	2007.000	949.700	2011.000	950.300	2014.000
	GR	960.000	2400.000	980.000	2750.000	0.0	0.0	0.0	0.0	0.0	0.0
	NC	0.150	0.150	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	5.400	0.0	0.0	0.0
C	XI	3.000	20.000	1981.000	2020.000	775.000	750.000	807.000	0.0	0.0	0.0
	GR	973.900	1860.000	963.400	1870.000	963.400	1898.000	953.300	1925.000	952.300	1971.000
	GR	951.400	1981.000	948.000	1999.000	947.000	1991.000	946.500	2000.000	946.000	2006.000
	GR	946.300	2008.000	947.900	2011.000	951.900	2020.000	953.200	2043.000	957.300	2055.000
	GR	959.500	2100.000	961.900	2175.000	962.000	2400.000	961.400	2529.000	966.700	2540.000
	ET	0.0	0.0	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0
D	XI	4.000	19.000	1975.000	2017.000	895.000	895.000	895.000	0.0	0.0	0.0
	GR	975.100	1888.000	970.400	1900.000	965.500	1927.000	955.200	1955.000	953.000	1975.000
	GR	951.400	1983.000	950.100	1990.000	949.700	1991.000	949.700	2000.000	949.700	2009.000
	GR	950.100	2010.000	954.100	2017.000	955.000	2120.000	958.100	2143.000	960.500	2200.000
	GR	962.100	2376.000	962.300	2459.000	961.600	2529.000	974.900	2553.000	0.0	0.0
	NC	0.150	0.150	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ET	0.0	0.0	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0

X1	4.100	17.000	1975.000	2025.000	792.000	775.000	792.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	962.400	962.400	0.0
GR	973.700	1795.000	961.900	1819.000	962.300	1845.000	962.700	1900.000	963.600	1975.000
GR	951.100	1975.000	951.100	1987.000	952.500	2000.000	951.100	2018.000	951.100	2025.000
GR	963.600	2025.000	963.300	2100.000	962.800	2194.000	962.200	2246.000	962.400	2308.000
GR	961.900	2420.000	968.400	2432.000	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2025.000
X1	4.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	962.400	962.400	0.0
BT	4.000	1975.000	963.600	0.0	1975.000	965.200	962.400	2025.000	965.200	962.400
BT	2025.000	963.600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2025.000
X1	4.120	0.0	0.0	0.0	33.000	33.000	33.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	963.600	963.600	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1975.000	2025.000
X1	4.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	963.600	963.600	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	2.400	0.0	0.0	0.0
X1	4.150	12.000	1974.000	2015.000	50.000	50.000	50.000	0.0	0.0	0.0
X4	22.000	960.000	1920.000	957.900	1957.000	0.0	0.0	0.0	0.0	0.0
GR	980.000	1800.000	953.600	1974.000	953.000	1988.000	952.000	1950.000	951.500	1992.000
GR	951.400	2000.000	951.500	2007.000	952.000	2010.000	953.000	2012.000	953.700	2015.000
GR	960.200	2050.000	980.000	2550.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.150	0.150	0.055	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	1.400	0.0	0.0	0.0
X1	5.000	17.000	1966.000	2014.000	650.000	600.000	673.000	0.0	0.0	0.0
GR	977.100	1893.000	963.800	1913.000	964.200	1933.000	963.700	1947.000	957.200	1966.000
GR	955.000	1991.000	953.500	1994.000	952.800	2000.000	953.000	2008.000	953.500	2009.000
GR	957.900	2014.000	962.800	2057.000	963.900	2100.000	967.500	2366.000	965.900	2452.000
GR	967.800	2500.000	972.900	2615.000	0.0	0.0	0.0	0.0	0.0	0.0
QT	9.000	1640.000	2890.000	3510.000	5250.000	3510.000	3510.000	3510.000	3510.000	3510.000
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
NC	0.150	0.150	0.055	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	13.400	0.0	0.0	0.0
X1	6.000	15.000	1980.000	2012.000	1000.000	600.000	1300.000	0.0	0.0	0.0
GR	980.700	1695.000	963.500	1737.000	962.200	1755.000	961.200	1826.000	960.600	1868.000
GR	961.000	1980.000	958.900	1991.000	957.400	1992.000	955.600	2003.000	957.200	2009.000
GR	957.400	2010.000	959.300	2012.000	960.900	2055.000	991.000	2106.000	991.000	2126.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	6.600	0.0	0.0	0.0
X1	7.000	18.000	1977.000	2025.000	800.000	905.000	905.000	0.0	0.0	0.0
GR	981.700	1600.000	968.300	1675.000	964.300	1710.000	964.200	1803.000	963.700	1860.000
GR	962.600	1916.000	964.000	1949.000	964.300	1977.000	960.500	1984.000	958.600	1987.000
GR	958.000	2000.000	958.500	2011.000	959.200	2014.000	960.500	2016.000	963.100	2020.000
GR	964.500	2025.000	990.100	2065.000	991.000	2075.000	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1925.000	2042.000
X1	7.100	11.000	1985.000	2015.000	1174.000	1209.000	1209.000	0.0	0.0	0.0
GR	985.000	1679.000	972.500	1793.000	968.600	1915.000	967.000	1954.000	968.500	1985.000
GR	958.700	1985.000	958.700	2015.000	968.500	2015.000	965.200	2100.000	998.000	2175.000
GR	993.800	2187.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1925.000	2042.000
X1	7.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
BT	3.000	1985.000	968.500	967.000	2015.000	968.500	967.000	2015.000	968.500	967.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1925.000	2042.000
X1	7.120	0.0	0.0	0.0	9.000	9.000	9.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
BT	0.0	0.0	0.0	0.0	0.500	1.000	0.0	0.0	0.0	0.0

ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1925.000	2042.000
X1	7.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
BT	3.000	1985.000	968.500	967.000	2015.000	968.500	967.000	2015.000	968.500	967.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1925.000	2042.000
X1	7.120	0.0	0.0	0.0	9.000	9.000	9.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
NC	10.0	0.0	0.0	0.800	1.000	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1925.000	2042.000
X1	7.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0
H X1	8.000	13.000	1978.000	2016.000	90.000	125.000	125.000	0.0	0.0	0.0
GR	985.000	1679.000	972.500	1793.000	968.600	1915.000	967.000	1954.000	964.000	1978.000
GR	961.500	1986.000	961.200	2000.000	960.200	2013.000	960.600	2014.000	966.200	2016.000
GR	965.200	2100.000	996.000	2170.000	993.800	2187.000	0.0	0.0	0.0	0.0
NC	0.150	0.150	0.055	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0
I X1	9.000	16.000	1985.000	2016.000	950.000	925.000	1070.000	0.0	0.0	0.0
GR	985.300	1600.000	973.900	1700.000	969.100	1800.000	968.700	1658.000	970.400	1937.000
GR	971.100	1960.000	969.200	1985.000	963.700	1992.000	963.300	1996.000	962.500	2000.000
GR	963.700	2010.000	966.900	2016.000	967.800	2086.000	972.100	2155.000	976.000	2200.000
GR	985.700	2250.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	9.100	14.000	1992.000	2009.000	188.000	188.000	188.000	0.0	0.0	0.0
GR	985.300	1600.000	973.900	1700.000	969.100	1800.000	968.700	1858.000	970.400	1937.000
GR	971.100	1960.000	971.800	1992.000	963.700	1992.000	963.700	2009.000	971.800	2009.000
GR	967.800	2086.000	972.100	2155.000	976.000	2200.000	985.700	2250.000	0.0	0.0
X1	9.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
BT	3.000	1992.000	971.800	969.600	2009.000	971.800	969.600	2009.000	971.800	969.600
Y1	9.120	0.0	0.0	0.0	12.000	12.000	12.000	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
Y1	9.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	4.400	0.0	0.0	0.0
X1	10.000	14.000	1980.000	2020.000	788.000	788.000	788.000	0.0	0.0	0.0
GR	990.900	1500.000	987.800	1540.000	976.300	1665.000	973.600	1800.000	971.300	1919.000
J GR	971.300	1943.000	970.300	1952.000	970.700	1980.000	966.600	1980.000	966.500	2000.000
GR	966.600	2014.000	968.100	2018.000	970.000	2020.000	992.800	2050.000	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1915.000	2031.000
X1	10.100	17.000	1969.000	2031.000	1000.000	1100.000	1057.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	977.700	0.0
GR	989.800	1748.000	981.500	1800.000	979.300	1822.000	977.300	1858.000	976.200	1939.000
GR	976.800	1920.000	977.000	1935.000	978.900	1969.000	969.200	1969.000	969.200	1969.000
GR	977.400	1999.000	977.500	2002.000	970.200	2002.000	972.900	2031.000	979.500	2031.000
GR	982.600	2100.000	989.800	2184.000	0.0	0.0	0.0	0.0	0.0	0.0

NC	0.0	0.0	0.0	0.800	1.000	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1915.000	2031.000
X1	10.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	977.700	0.0
BT	3.000	1969.000	978.900	977.200	2031.000	979.500	977.700	2031.000	979.500	977.700
NC	0.0	0.0	0.0	0.300	0.500	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1915.000	2031.000
X1	10.120	0.0	0.0	0.0	23.000	23.000	23.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	979.500	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1915.000	2031.000
X1	10.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	977.200	979.500	0.0
NC	0.0	0.0	0.0	0.400	0.600	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	3.400	0.0	0.0	0.0
X1	10.150	15.000	1987.000	2010.000	50.000	50.000	50.000	0.0	0.0	0.0
X4	2.000	980.000	1960.000	977.100	1976.000	0.0	0.0	0.0	0.0	0.0
GR	1000.000	1750.000	972.400	1987.000	971.000	1995.000	969.700	1996.000	969.200	1997.000
GR	969.000	2000.000	969.200	2003.000	969.800	2004.000	970.700	2005.000	971.600	2010.000
GR	971.900	2029.000	970.100	2035.000	974.000	2048.000	980.000	2100.000	1000.000	2200.000
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0
X1	10.200	10.000	1968.000	2032.000	1100.000	900.000	1012.000	0.0	0.0	0.0
GR	1000.000	1000.000	992.500	1100.000	994.400	1960.000	977.000	1988.000	973.300	1992.000
GR	973.300	2006.000	975.200	2032.000	994.600	2032.000	994.800	2100.000	1000.000	2130.000
X1	10.210	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
BT	3.000	1968.000	994.400	986.700	2032.000	994.600	986.700	2032.000	994.600	986.700
X1	10.220	0.0	0.0	0.0	10.000	10.000	10.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X1	10.230	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	5.400	0.0	0.0	0.0
X1	10.250	11.000	1969.000	2018.000	50.000	50.000	50.000	0.0	0.0	0.0
GR	993.100	1919.000	978.000	1969.000	975.000	1985.000	973.600	2000.000	974.900	2010.000
GR	975.500	2018.000	977.200	2036.000	978.000	2064.000	982.500	2082.000	982.300	2100.000
GR	993.800	2125.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0
X1	11.000	18.000	1975.000	2013.000	750.000	950.000	859.000	0.0	0.0	0.0
GR	996.800	1510.000	988.400	1674.000	992.100	1690.000	992.500	1694.000	986.400	1714.000
GR	982.400	1800.000	982.200	1847.000	983.700	1923.000	983.000	1934.000	980.400	1942.000
GR	979.200	1975.000	977.400	1991.000	976.500	2000.000	977.000	2011.000	977.400	2011.000
GR	982.700	2013.000	983.300	2030.000	996.800	2045.000	0.0	0.0	0.0	0.0
OT	9.000	1380.000	2490.000	2950.000	4400.000	2950.000	2950.000	2951.000	2950.000	2950.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	7.400	0.0	0.0	0.0
X1	12.000	19.000	1983.000	2028.000	875.000	1100.000	1000.000	0.0	0.0	0.0
GR	1000.500	1672.000	996.400	1913.000	990.500	1927.000	989.700	1937.000	990.500	1944.000
GR	985.000	1973.000	984.600	1983.000	979.200	1992.000	978.900	2000.000	979.200	2009.000
GR	980.100	2019.000	984.800	2028.000	984.000	2061.000	988.600	2200.000	984.700	2232.000
GR	985.400	2300.000	985.700	2350.000	986.600	2395.000	1000.500	2445.000	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0
X1	12.100	15.000	1979.000	2022.000	1000.000	850.000	961.000	0.0	0.0	0.0
GR	1003.000	1743.000	998.900	1750.000	996.800	1775.000	995.900	1797.000	994.400	1822.000
GR	993.000	1866.000	992.500	1979.000	980.000	1979.000	980.300	2011.000	987.300	2021.000
GR	992.500	2022.000	991.300	2052.000	991.400	2120.000	993.800	2165.000	1002.500	2249.000

GR	1000.500	1872.000	996.400	1913.000	990.500	1927.000	989.700	1937.000	990.500	1944.000
GR	985.000	1973.000	984.600	1983.000	979.200	1992.000	978.900	2000.000	979.200	2009.000
GR	980.100	2019.000	984.800	2028.000	984.000	2061.000	983.600	2200.000	984.700	2232.000
GR	985.400	2300.000	985.700	2350.000	986.600	2395.000	1000.500	2445.000	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0

X1	12.100	15.000	1979.000	2022.000	1000.000	850.000	961.000	0.0	0.0	0.0
GR	1003.000	1758.000	998.900	1756.000	996.800	1776.000	995.900	1799.000	994.600	1629.000
GR	993.000	1866.000	992.500	1979.000	980.000	1979.000	980.000	2012.000	989.300	2022.000
GR	992.500	2022.000	991.300	2052.000	991.400	2120.000	993.800	2165.000	1002.500	2245.000
NC	0.0	0.0	0.0	0.800	1.000	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1979.000	2022.000

X1	12.110	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
BT	3.000	1979.000	992.500	989.300	2022.000	992.500	989.300	2022.000	992.500	989.300
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	1979.000	2022.000

X1	12.120	0.0	0.0	0.0	16.000	16.000	16.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0

X1	12.130	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	992.700	992.700	0.0
NC	0.0	0.0	0.0	0.600	0.800	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	1.400	0.0	0.0	0.0

X1	12.150	11.000	1986.000	2013.000	50.000	50.000	50.000	0.0	0.0	0.0
X4	1.000	991.600	1965.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GR	1000.000	1650.000	986.000	1981.000	985.500	1986.000	983.000	1989.000	980.900	1992.000
GR	979.600	2000.000	979.600	2006.000	983.000	2011.000	984.800	2013.000	987.600	2029.000
GR	1000.000	2225.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0

X1	13.000	22.000	1982.000	2020.000	806.000	806.000	806.000	0.0	0.0	0.0
GR	1000.500	1505.000	1000.300	1552.000	1000.500	1563.000	1000.500	1574.000	1000.200	1600.000
GR	1001.900	1719.000	996.200	1817.000	993.600	1847.000	992.700	1852.000	992.400	1858.000
GR	990.600	1882.000	988.100	1891.000	986.600	1982.000	985.700	1987.000	984.200	1990.000
GR	983.800	1994.000	983.900	2000.000	984.300	2008.000	990.000	2020.000	997.700	2034.000
GR	998.700	2061.000	1005.400	2075.000	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0

X1	14.000	23.000	1976.000	2013.000	895.000	845.000	695.000	0.0	0.0	0.0
GR	1006.300	1715.000	1000.400	1725.000	1000.400	1773.000	1001.300	1782.000	1001.800	1793.000
GR	1001.400	1808.000	999.900	1832.000	993.800	1850.000	993.300	1866.000	992.300	1901.000
GR	990.600	1976.000	986.700	1987.000	986.200	1997.000	985.900	2000.000	985.700	2005.000
GR	986.200	2006.000	990.800	2013.000	990.300	2038.000	991.900	2084.000	976.900	2098.000
GR	999.300	2145.000	1007.000	2222.000	1026.600	2222.000	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	7.400	0.0	0.0	0.0

X1	15.000	14.000	1973.000	2016.000	690.000	690.000	690.000	0.0	0.0	0.0
GR	1008.300	1891.000	996.500	1918.000	994.800	1948.000	994.200	1973.000	988.000	1986.000
GR	987.100	1988.000	986.600	1994.000	987.600	2000.000	987.300	2008.000	983.500	2009.000
GR	991.800	2016.000	989.700	2031.000	992.600	2103.000	1008.500	2142.000	0.0	0.0
EJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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                                                                                THIS RUN EXECUTED 08/15/78   11.07
**************************************************
HEC2 RELEASE DATED NOV 76 UPDATED  AUG1977
ERROR CORR - 01,02
MODIFICATION - 50,51,52,53, HBJ UPDATE MADE 16 JAN 5 PM
**************************************************

T1      35 WPA FIS (CONTRACT H-4553)
T2      CHARTIERS TOWNSHIP WASHINGTON CO.
T3      100E 29 DCK CHARTIERS RUN

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
      0.       7.       0.       0.      0.0      0.0      0.0      0.     945.180    0.0

J2  NPROF    IPLOT    PREVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
    2.000     0.0    -1.000     0.0      0.0      0.0      0.0      0.0      0.0      0.0

*PROF 2

CCHV=  0.100 CFHV=   0.300
*SECNO .010
 2800 NAT Q1=    840.24  WSEL=    945.18  ENC Q1=    857.45  WSEL=    945.28  RATIO= [illegible]
 NAT Q1=    857.  RATIOS LOB,CH,ROB=  0.0      1.0000  0.0     WSEL=    945.26
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THIS RUN EXECUTED 08/15/78 11.19

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**************************************************
HEC2 RELEASE DATED NOV 76 UPDATED AUG1977
ERRCR CORR - 01,02
MODIFICATION - 50,51,52,53, 48J UPDATE MADE 16 JAN 5 PM
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T1    35 WPA FIS (CONTRACT H-4553)
T2    CHARTIERS TOWNSHIP WASHINGTON CO.
T3    10 YR FLOOD-29-DCK-CHARTIERS RUN
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J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	2.	0.	0.	0.002500	0.0	0.0	0.	960.000	0.0

J2	NPROF	IPLOT	PREVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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*PROF 3

CCHV=  0.100 CEHV=   0.300
*SECNO .010
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG     HV     HL     OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH    AROB   VOL    TWA     LEFT/RIGHT
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THIS RUN EXECUTED 08/15/78 11.25

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* HEC2 RELEASE DATED NOV 76 UPDATED AUG1977
  ERROR CORR - 01,02
  MODIFICATION - 50,51,52,53, MBJ UPDATE MADE 16 JAN 5 PM
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T1      35 WPA/FIS (CONTRACT H-4553)
T2      CHARTIERS TOWNSHIP WASHINGTON CO.
T3      50 YR FLOOD-29-DCK-CHARTIERS RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
          0.        3.        0.        0.  0.002500      0.0       0.0       0.  960.000      0.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     EN        ALLOC     IBW       CHNIM     ITRACE
      4.000     0.0    -1.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0
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THIS RUN EXECUTED 08/15/78 11.35

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HEC2 RELEASE DATED NOV 76 UPDATED AUG1977
ERROR CORR - 01,02
MODIFICATION - 50,51,52,53, HBJ UPDATE MADE 16 JAN 5 PM
**************************************************

T1     35 WPC FIS (CONTRACT H-4553)
T2     CHARTIERS TOWNSHIP WASHINGTON CO.
T3     500F=29-DCK-CHARTIERS RUN

J1  ICHECK    INQ     NINV     IDIR      STRT    METRIC    HVINS      Q       WSEL       FQ
      0.       5.       0.       0.  0.002500       0.0      0.0      0.   960.000      0.0

J2  NPROF    IPLOT    PRFVS    XSECV     XSECH       FN     ALLDC     IBW     CHNIM    ITRACE
   15.000     0.0   -1.000      0.0       0.0       0.0      0.0      0.0      0.0       0.0

*PROF 5

CCHV=  0.100 CEHV=   0.300
*SECNO .010
   SECNO    DEPTH    CWSEL    CRIWS    WSELK      EG       HV       HL     OLOSS   BANK ELEV
     Q      QLOB      QCH     QROB     ALOB      ACH     AROB      VOL     TWA    LEFT/RIGHT
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THIS RUN EXECUTED 08/15/78 12.00

HECZERELEASE DATED NOV 76 UPDATED AUG1977
ERROR CORR - 01,02
MODIFICATION - 50,51,52,53, MBJ UPDATE MADE 16 JAN 5 PM

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

100 YR FLOOD-25-DCK-CHAR

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
0.010	4200.00	945.18	9.58	300.00	0.0	1975.59	0.0	1970.00	2055.00	0.0	2048.66	73.06
0.010	4200.00	945.18	9.58	300.00	0.0	1975.59	1970.00	1970.00	2055.00	2055.00	2048.66	73.07
0.010	1920.00	941.97	6.37	300.00	0.0	1980.41	0.0	1970.00	2055.00	0.0	2039.07	58.66
0.010	3400.00	944.19	8.59	300.00	0.0	1977.08	0.0	1970.00	2055.00	0.0	2049.71	68.63
0.010	6300.00	947.36	11.76	300.00	0.0	1972.32	0.0	1970.00	2055.00	0.0	2061.66	89.35
0.100	4200.00	946.44	8.34	422.00	422.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.100	4200.00	946.44	8.34	422.00	422.00	1975.00	1975.00	1975.00	2024.00	2024.00	2024.00	49.00
0.100	1920.00	943.38	5.29	422.00	422.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.100	3400.00	945.52	7.42	422.00	422.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.100	6300.00	948.38	10.28	422.00	422.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.110	4200.00	946.45	8.35	1.00	423.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.110	4200.00	946.45	8.35	1.00	423.00	1975.00	1975.00	1975.00	2024.00	2024.00	2024.00	49.00
0.110	1920.00	943.39	5.29	1.00	423.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.110	3400.00	945.53	7.43	1.00	423.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.110	6300.00	948.39	10.29	1.00	423.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.120	4200.00	946.47	8.57	14.00	437.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.120	4200.00	946.47	8.57	14.00	437.00	1975.00	1975.00	1975.00	2024.00	2024.00	2024.00	49.00
0.120	1920.00	943.53	5.43	14.00	437.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.120	3400.00	945.71	7.61	14.00	437.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.120	6300.00	948.69	10.59	14.00	437.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.130	4200.00	946.67	8.57	1.00	438.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.130	4200.00	946.67	8.58	1.00	438.00	1975.00	1975.00	1975.00	2024.00	2024.00	2024.00	49.00
0.130	1920.00	943.54	5.44	1.00	438.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.130	3400.00	945.72	7.62	1.00	438.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.130	6300.00	948.74	11.64	1.00	438.00	1975.00	0.0	1975.00	2024.00	0.0	2024.00	49.00
0.150	4200.00	946.95	8.45	41.00	479.00	1961.47	0.0	1976.00	2024.00	0.0	2039.08	73.01
0.150	4200.00	946.99	8.49	41.00	479.00	1976.00	1976.00	1976.00	2024.00	2024.00	2024.00	48.00
0.150	1920.00	943.83	5.33	41.00	479.00	1966.38	0.0	1976.00	2024.00	0.0	2027.46	34.59
0.150	3400.00	945.99	7.49	41.00	479.00	1963.68	0.0	1976.00	2024.00	0.0	2032.91	64.33
0.150	6300.00	949.90	11.40	41.00	479.00	1629.18	0.0	1976.00	2024.00	0.0	2264.93	473.00

SECNO	Q	CHSEL	DEPTH	YLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
0.160	4200.00	947.86	9.16	25.00	504.00	1754.29	0.0	1976.00	2024.00	0.0	2037.12	147.00
0.160	4200.00	947.15	8.46	25.00	504.00	1976.00	1976.00	1976.00	2024.00	2024.00	2024.00	48.00
0.160	1920.00	944.92	6.22	25.00	504.00	1966.08	0.0	1976.00	2024.00	0.0	2030.30	64.21
0.160	3400.00	946.82	8.12	25.00	504.00	1961.82	0.0	1976.00	2024.00	0.0	2034.69	82.86
0.160	6300.00	951.61	12.91	25.00	504.00	1537.82	0.0	1976.00	2024.00	0.0	2319.12	827.93
0.200	4200.00	947.99	9.19	25.00	529.00	1739.15	0.0	1976.00	2024.00	0.0	2037.22	176.24
0.200	4200.00	948.08	9.28	25.00	529.00	1976.00	1976.00	1976.00	2024.00	2024.00	2024.00	48.00
0.200	1920.00	945.05	6.25	25.00	529.00	1976.00	0.0	1976.00	2024.00	0.0	2024.00	48.00
0.200	3400.00	946.96	8.16	25.00	529.00	1976.00	0.0	1976.00	2024.00	0.0	2024.00	48.00
0.200	6300.00	951.68	12.89	25.00	529.00	1534.26	0.0	1976.00	2024.00	0.0	2320.61	736.21
0.210	4200.00	948.00	9.20	1.00	530.00	1738.53	0.0	1976.00	2024.00	0.0	2037.23	171.19
0.210	4200.00	948.09	9.29	1.00	530.00	1815.62	1815.62	1976.00	2024.00	2024.00	2025.09	87.46
0.210	1920.00	945.05	6.25	1.00	530.00	1976.00	0.0	1976.00	2024.00	0.0	2024.00	48.00
0.210	3400.00	946.97	8.17	1.00	530.00	1976.00	0.0	1976.00	2024.00	0.0	2024.00	48.00
0.210	6300.00	952.37	13.57	1.00	530.00	1501.30	0.0	1976.00	2024.00	0.0	2334.45	833.15
0.220	4200.00	951.83	13.03	49.00	579.00	1526.65	0.0	1976.00	2024.00	0.0	2323.42	796.87
0.220	4200.00	949.99	11.19	49.00	579.00	1858.87	1858.87	1976.00	2024.00	2024.00	2024.00	153.54
0.220	1920.00	945.55	6.75	49.00	579.00	1976.00	0.0	1976.00	2024.00	0.0	2024.00	48.00
0.220	3400.00	947.73	8.93	49.00	579.00	1976.00	0.0	1976.00	2024.00	0.0	2024.00	48.00
0.220	6300.00	952.68	13.88	49.00	579.00	1490.33	0.0	1976.00	2024.00	0.0	2343.61	853.29
0.230	4200.00	951.77	12.97	1.00	580.00	1529.88	0.0	1976.00	2024.00	0.0	2322.45	776.77
0.230	4200.00	952.56	13.76	1.00	580.00	1879.57	1879.57	1976.00	2024.00	2024.00	2024.00	144.44
0.230	1920.00	945.76	6.96	1.00	580.00	1976.00	0.0	1976.00	2024.00	0.0	2024.00	48.00
0.230	3400.00	948.40	9.60	1.00	580.00	1976.00	0.0	1976.00	2024.00	0.0	2024.00	48.00
0.230	6300.00	952.54	13.74	1.00	580.00	1495.02	0.0	1976.00	2024.00	0.0	2337.89	842.68
0.250	4200.00	951.83	13.63	50.00	630.00	1846.98	0.0	1994.00	2017.00	0.0	2091.32	244.32
0.250	4200.00	952.64	14.44	50.00	630.00	1938.92	1938.92	1994.00	2017.00	2037.42	2037.42	98.50
0.250	1920.00	945.98	7.78	50.00	630.00	1984.27	0.0	1994.00	2017.00	0.0	2036.61	52.34
0.250	3400.00	948.61	10.41	50.00	630.00	1980.14	0.0	1994.00	2017.00	0.0	2040.17	60.03
0.250	6300.00	952.63	14.44	50.00	630.00	1812.85	0.0	1994.00	2017.00	0.0	2125.60	312.75
0.300	3510.00	953.96	13.16	359.00	989.00	1932.22	0.0	1982.00	2018.00	0.0	2307.94	375.73
0.300	3510.00	954.14	13.74	359.00	989.00	1982.00	1982.00	1982.00	2018.00	2125.74	2125.73	143.74
0.300	1640.00	948.26	7.88	359.00	989.00	1982.00	0.0	1982.00	2018.00	0.0	2018.00	36.00
0.300	2690.00	951.38	10.98	359.00	989.00	1963.12	0.0	1982.00	2018.00	0.0	2161.21	196.09
0.300	5250.00	955.78	15.38	359.00	989.00	1802.50	0.0	1982.00	2018.00	0.0	2339.78	537.20
0.310	3510.00	953.86	13.48	1.00	990.00	1930.58	0.0	1982.00	2018.00	0.0	2312.63	380.69
0.310	3510.00	954.32	13.92	1.00	990.00	1982.00	1982.00	1982.00	2018.00	2125.32	2125.32	143.32
0.310	1640.00	948.28	7.88	1.00	990.00	1982.00	0.0	1982.00	2018.00	0.0	2018.00	36.00
0.310	2690.00	951.39	10.99	1.00	990.00	1963.06	0.0	1982.00	2018.00	0.0	2162.23	196.17
0.310	5250.00	955.98	15.58	1.00	990.00	1787.87	0.0	1982.00	2018.00	0.0	2342.62	554.74
0.320	3510.00	953.95	13.55	20.00	1010.00	1930.36	0.0	1982.00	2018.00	0.0	2313.53	380.27
0.320	3510.00	954.41	14.01	20.00	1010.00	1982.00	1982.00	1982.00	2018.00	2126.66	2126.66	144.66
0.320	1640.00	948.44	8.04	20.00	1010.00	1982.00	0.0	1982.00	2018.00	0.0	2018.00	36.00
0.320	2690.00	952.56	12.16	20.00	1010.00	1937.21	0.0	1982.00	2018.00	0.0	2262.22	325.01
0.320	5250.00	956.01	15.61	20.00	1010.00	1786.11	0.0	1982.00	2018.00	0.0	2342.89	556.36

SECNO	Q	CHSEL	DEPTH	YLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
0.330	3510.00	953.90	13.51	1.00	1011.00	1930.48	0.0	1982.00	2018.00	0.0	2312.93	382.45
0.330	3510.00	954.38	13.98	1.00	1011.00	1982.00	1982.00	1982.00	2018.00	2124.05	2124.05	142.05
0.330	1640.00	948.71	8.31	1.00	1011.00	1982.00	0.0	1982.00	2018.00	0.0	2018.00	36.00

	SECNO	Q	CHSEL	DEPTH	XLCH	CUM DIS	SSTA	SIENGL	STCHL	STCHR	STEACR	ENDST	TOPWID	
	0.330	3510.00	953.90	13.51	1.00	1011.00	1930.48	0.0	1982.00	2018.00	0.0	2312.93	382.45	
	0.330	3510.00	954.38	13.98	1.00	1011.00	1982.00	1982.00	1982.00	2018.00	2124.05	2124.05	142.05	
	0.330	1640.00	948.71	8.31	1.00	1011.00	1982.00	0.0	1982.00	2018.00	0.0	2018.00	36.00	
	0.330	2890.00	952.54	12.14	1.00	1011.00	1937.31	0.0	1982.00	2018.00	0.0	2260.47	323.15	
	0.330	5250.00	955.98	15.58	1.00	1011.00	1788.38	0.0	1982.00	2018.00	0.0	2342.52	554.13	
	0.350	3510.00	954.19	13.09	50.00	1061.00	1944.24	0.0	1985.00	2015.00	0.0	2328.03	383.79	
	0.350	3510.00	954.70	13.60	50.00	1061.00	1985.00	1985.00	1985.00	2015.00	2131.45	2131.45	146.45	
	0.350	1640.00	946.82	7.73	50.00	1061.00	1977.16	0.0	1985.00	2015.00	0.0	2086.16	138.94	
	0.350	2890.00	953.07	11.97	50.00	1061.00	1957.73	0.0	1985.00	2015.00	0.0	2305.08	351.35	
	0.350	5250.00	956.11	15.02	50.00	1061.00	1932.21	0.0	1985.00	2015.00	0.0	2334.55	402.36	
	0.400	3510.00	954.44	13.14	342.00	1403.00	1833.20	0.0	1989.00	2011.00	0.0	2172.98	339.35	
	0.400	3510.00	954.9	13.62	342.00	1403.00	1967.97	1967.97	1989.00	2011.00	2086.77	2086.77	118.60	
	0.400	1640.00	950.06	8.76	342.00	1403.00	1840.69	0.0	1989.00	2011.00	0.0	2150.44	309.75	
	0.400	2890.00	953.39	12.09	342.00	1403.00	1834.97	0.0	1989.00	2011.00	0.0	2167.43	332.46	
	0.400	5250.00	956.32	15.02	342.00	1403.00	1829.94	0.0	1989.00	2011.00	0.0	2181.91	351.46	
	0.410	3510.00	954.48	13.18	1.00	1404.00	1833.11	0.0	1989.00	2011.00	0.0	2172.82	339.71	
	0.410	3510.00	955.05	13.75	1.00	1404.00	1967.43	1967.44	1989.00	2011.00	2088.02	2088.02	120.59	
	0.410	1640.00	950.18	8.88	1.00	1404.00	1840.49	0.0	1989.00	2011.00	0.0	2151.05	310.57	
	0.410	2890.00	953.43	12.13	1.00	1404.00	1834.91	0.0	1989.00	2011.00	0.0	2167.62	332.70	
	0.410	5250.00	956.37	15.07	1.00	1404.00	1829.87	0.0	1989.00	2011.00	0.0	2182.13	352.26	
	0.420	3510.00	954.48	13.18	11.00	1415.00	1833.11	0.0	1989.00	2011.00	0.0	2172.84	339.73	
	0.420	3510.00	955.06	13.76	11.00	1415.00	1967.41	1967.42	1989.00	2011.00	2088.05	2088.05	120.64	
	0.420	1640.00	950.20	8.90	11.00	1415.00	1840.46	0.0	1989.00	2011.00	0.0	2151.11	310.66	
	0.420	2890.00	953.43	12.13	11.00	1415.00	1834.71	0.0	1989.00	2011.00	0.0	2167.64	332.74	
	0.420	5250.00	956.37	15.07	11.00	1415.00	1829.86	0.0	1989.00	2011.00	0.0	2182.14	352.28	
	0.430	3510.00	954.47	13.17	1.00	1416.00	1833.11	0.0	1989.00	2011.00	0.0	2172.84	339.74	
	0.430	3510.00	955.04	13.74	1.00	1416.00	1966.99	1966.99	1989.00	2011.00	2087.38	2087.38	120.39	
	0.430	1640.00	950.18	8.88	1.00	1416.00	1840.49	0.0	1989.00	2011.00	0.0	2151.13	310.64	
	0.430	2890.00	953.43	12.13	1.00	1416.00	1834.90	0.0	1989.00	2011.00	0.0	2167.64	332.74	
	0.430	5250.00	956.36	15.06	1.00	1416.00	1829.86	0.0	1989.00	2011.00	0.0	2182.15	352.29	
A	1.000	3510.00	954.71	13.01	819.00	2235.00	1967.21	0.0	1981.00	2021.00	0.0	2600.96	737.85	A
	1.000	3510.00	955.55	13.85	819.00	2235.00	1974.51	1974.51	1981.00	2021.00	2397.66	2397.66	423.17	
	1.000	1640.00	950.78	9.08	819.00	2235.00	1891.54	0.0	1981.00	2021.00	0.0	2506.70	614.66	
	1.000	2890.00	953.46	11.98	819.00	2235.00	1969.94	0.0	1981.00	2021.00	0.0	2575.76	709.83	
	1.000	5250.00	957.62	16.14	819.00	2235.00	1853.64	0.0	1981.00	2021.00	0.0	2614.37	760.83	
B	2.000	3510.00	954.95	11.55	760.00	2995.00	1967.62	0.0	1980.00	2021.00	0.0	2533.22	565.60	B
	2.000	3510.00	955.63	12.43	760.00	2995.00	1980.00	1980.00	1980.00	2021.00	2315.70	2315.70	335.70	
	2.000	1640.00	951.52	8.12	760.00	2995.00	1976.19	0.0	1980.00	2021.00	0.0	2447.98	471.79	
	2.000	2890.00	953.97	10.57	760.00	2995.00	1970.07	0.0	1980.00	2021.00	0.0	2519.42	546.85	
	2.000	5250.00	957.64	14.24	760.00	2995.00	1962.90	0.0	1980.00	2021.00	0.0	2548.12	585.22	
	2.100	3510.00	955.82	11.42	802.00	3797.00	1976.00	0.0	1978.00	2023.00	0.0	2023.00	45.00	
	2.100	3510.00	956.81	12.41	802.00	3797.00	1978.00	1978.00	1978.00	2023.00	2023.00	2023.00	45.00	
	2.100	1640.00	951.77	9.37	802.00	3797.00	1976.00	0.0	1978.00	2023.00	0.0	2023.00	45.00	
	2.100	2890.00	955.14	10.78	802.00	3797.00	1976.00	0.0	1978.00	2023.00	0.0	2023.00	45.00	
	2.100	5250.00	957.63	13.23	802.00	3797.00	1978.00	0.0	1978.00	2023.00	0.0	2332.52	332.16	

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
2.110	3510.00	955.83	11.43	1.00	3798.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.110	3510.00	956.80	12.40	1.00	3798.00	1978.00	1978.00	1978.00	2023.00	2023.00	2023.00	45.00
2.110	1640.00	953.78	9.38	1.00	3798.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.110	2890.00	955.19	10.79	1.00	3798.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.110	5250.00	957.91	13.51	1.00	3798.00	1978.00	0.0	1978.00	2023.00	0.0	2327.69	343.09
2.120	3510.00	955.97	11.57	14.00	3812.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.120	3510.00	956.91	12.51	14.00	3812.00	1978.00	1978.00	1978.00	2023.00	2023.00	2023.00	45.00
2.120	1640.00	953.82	9.42	14.00	3812.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.120	2890.00	955.29	10.89	14.00	3812.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.120	5250.00	958.14	13.74	14.00	3812.00	1978.00	0.0	1978.00	2023.00	0.0	2331.60	346.38
2.130	3510.00	955.97	11.57	1.00	3813.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.130	3510.00	956.98	12.58	1.00	3813.00	1978.00	1978.00	1978.00	2023.00	2023.00	2023.00	45.00
2.130	1640.00	953.83	9.43	1.00	3813.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.130	2890.00	955.30	10.90	1.00	3813.00	1978.00	0.0	1978.00	2023.00	0.0	2023.00	45.00
2.130	5250.00	958.15	13.75	1.00	3813.00	1978.00	0.0	1978.00	2023.00	0.0	2331.92	346.57
2.150	3510.00	956.87	12.17	50.00	3863.00	1956.89	0.0	1990.00	2011.00	0.0	2289.98	321.00
2.150	3510.00	957.68	12.98	50.00	3863.00	1990.00	1990.00	1990.00	2011.00	2129.07	2129.06	139.06
2.150	1640.00	953.97	9.27	50.00	3863.00	1963.85	0.0	1990.00	2011.00	0.0	2187.78	224.93
2.150	2890.00	955.92	11.22	50.00	3863.00	1960.50	0.0	1990.00	2011.00	0.0	2256.87	296.38
2.150	5250.00	958.54	13.84	50.00	3863.00	1956.05	0.0	1990.00	2011.00	0.0	2346.63	342.58
3.000	3510.00	958.69	12.69	807.00	4670.00	1910.69	0.0	1981.00	2020.00	0.0	2084.18	173.56
3.000	3510.00	959.63	13.63	807.00	4670.00	1934.83	1934.83	1981.00	2020.00	2036.51	2036.51	101.69
3.000	1640.00	955.78	9.78	807.00	4670.00	1918.37	0.0	1981.00	2020.00	0.0	2050.74	132.36
3.000	2890.00	957.82	11.82	807.00	4670.00	1912.91	0.0	1981.00	2020.00	0.0	2067.19	154.29
3.000	5250.00	960.49	14.49	807.00	4670.00	1905.78	0.0	1981.00	2020.00	0.0	2130.92	225.14
4.000	3510.00	960.62	10.92	895.00	5565.00	1944.32	0.0	1975.00	2017.00	0.0	2213.38	269.95
4.000	3510.00	961.37	11.67	895.00	5565.00	1974.68	1974.68	1975.00	2017.00	2119.48	2119.48	144.79
4.000	1640.00	957.47	7.77	895.00	5565.00	1950.56	0.0	1975.00	2017.00	0.0	2138.35	187.73
4.000	2890.00	959.70	10.00	895.00	5565.00	1946.19	0.0	1975.00	2017.00	0.0	2181.01	234.62
4.000	5250.00	962.66	12.96	895.00	5565.00	1940.39	0.0	1975.00	2017.00	0.0	2530.58	593.18
4.100	3510.00	962.24	11.14	792.00	6357.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.100	3510.00	962.89	11.79	792.00	6357.00	1975.00	1975.00	1975.00	2025.00	2025.00	2025.00	50.00
4.100	1640.00	959.06	7.96	792.00	6357.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.100	2890.00	961.33	10.23	792.00	6357.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.100	5250.00	964.22	13.12	792.00	6357.00	1814.28	0.0	1975.00	2025.00	0.0	2424.28	610.00
4.110	3510.00	962.25	11.15	1.00	6358.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.110	3510.00	962.86	11.76	1.00	6358.00	1975.00	1975.00	1975.00	2025.00	2025.00	2025.00	50.00
4.110	1640.00	959.06	7.96	1.00	6358.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.110	2890.00	961.34	10.24	1.00	6358.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.110	5250.00	964.22	13.12	1.00	6358.00	1814.29	0.0	1975.00	2025.00	0.0	2424.29	610.01
4.120	3510.00	962.37	11.27	33.00	6391.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.120	3510.00	963.08	11.98	33.00	6391.00	1975.00	1975.00	1975.00	2025.00	2025.00	2025.00	50.00
4.120	1640.00	959.13	8.03	33.00	6391.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.120	2890.00	961.45	10.35	33.00	6391.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.120	5250.00	964.71	13.61	33.00	6391.00	1813.26	0.0	1975.00	2025.00	0.0	2425.21	614.94

SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
4.130	3510.00	962.38	11.28	1.00	6392.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.130	3510.00	963.17	12.07	1.00	6392.00	1975.00	1975.00	1975.00	2025.00	2025.00	2025.00	50.00
4.130	1640.00	959.23	8.13	1.00	6392.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.130	2890.00	961.45	10.35	1.00	6392.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00

SECNO	Q	CWSEL	DEPTH	XLCH	CUM_DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
4.130	3510.00	962.38	11.28	1.00	6392.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.130	3510.00	963.17	12.07	1.00	6392.00	1975.00	1975.00	1975.00	2025.00	2025.00	2025.00	50.00
4.130	1640.00	959.17	8.04	1.00	6392.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.130	2890.00	961.45	10.35	1.00	6392.00	1975.00	0.0	1975.00	2025.00	0.0	2025.00	50.00
4.130	5250.00	964.69	13.59	1.00	6392.00	1813.33	0.0	1975.00	2025.00	0.0	2425.15	611.82
4.150	3510.00	962.61	11.21	50.00	6442.00	1904.32	0.0	1974.00	2015.00	0.0	2110.94	206.61
4.150	3510.00	963.33	11.93	50.00	6442.00	1934.20	1934.20	1974.00	2015.00	2067.64	2067.63	113.44
4.150	1640.00	959.17	7.77	50.00	6442.00	1934.67	0.0	1974.00	2015.00	0.0	2044.44	109.78
4.150	2890.00	961.58	10.18	50.00	6442.00	1910.48	0.0	1974.00	2015.00	0.0	2085.01	174.53
4.150	5250.00	964.74	13.34	50.00	6442.00	1891.55	0.0	1974.00	2015.00	0.0	2164.70	273.15
E 5.000	3510.00	964.42	11.62	673.00	7115.00	1912.08	0.0	1966.00	2014.00	0.0	2137.70	225.62 E
5.000	3510.00	964.86	12.06	673.00	7115.00	1956.92	1956.92	1966.00	2014.00	2057.77	2057.77	100.85
5.000	1640.00	961.19	8.39	673.00	7115.00	1954.67	0.0	1966.00	2014.00	0.0	2042.62	88.35
5.000	2890.00	963.48	10.68	673.00	7115.00	1947.66	0.0	1966.00	2014.00	0.0	2083.49	135.83
5.000	5250.00	966.49	13.69	673.00	7115.00	1908.95	0.0	1966.00	2014.00	0.0	2466.90	428.99
F 6.000	3510.00	967.35	10.75	1300.00	8415.00	1727.59	0.0	1980.00	2012.00	0.0	2056.36	335.78 F
6.000	3510.00	968.01	11.41	1300.00	8415.00	1800.39	1800.39	1980.00	2012.00	2014.47	2014.47	214.07
6.000	1640.00	964.30	7.80	1300.00	8415.00	1734.79	0.0	1980.00	2012.00	0.0	2061.17	326.37
6.000	2890.00	966.46	9.88	1300.00	8415.00	1729.71	0.0	1980.00	2012.00	0.0	2064.83	339.12
6.000	5250.00	969.28	12.68	1300.00	8415.00	1722.88	0.0	1980.00	2012.00	0.0	2069.76	346.88
G 7.000	3510.00	968.64	10.14	905.00	9320.00	1673.15	0.0	1977.00	2025.00	0.0	2031.45	356.30
7.000	3510.00	969.51	11.01	905.00	9320.00	1789.87	1789.87	1977.00	2025.00	2025.00	2025.00	235.13 G
7.000	1640.00	966.06	7.56	905.00	9320.00	1694.67	0.0	1977.00	2025.00	0.0	2027.42	352.75
7.000	2890.00	967.85	9.35	905.00	9320.00	1679.03	0.0	1977.00	2025.00	0.0	2030.22	351.19
7.000	5250.00	970.50	12.00	905.00	9320.00	1662.70	0.0	1977.00	2025.00	0.0	2034.37	371.68
7.100	3510.00	971.45	12.75	1209.00	10529.00	1825.70	0.0	1985.00	2015.00	0.0	2114.22	288.52
7.100	3510.00	972.16	13.46	1209.00	10529.00	1925.00	1925.00	1985.00	2015.00	2092.00	2092.00	167.00
7.100	1640.00	968.94	10.24	1209.00	10529.00	1904.20	0.0	1985.00	2015.00	0.0	2108.51	204.31
7.100	2890.00	970.74	12.04	1209.00	10529.00	1848.19	0.0	1985.00	2015.00	0.0	2112.58	264.39
7.100	5250.00	973.19	14.49	1209.00	10529.00	1786.71	0.0	1985.00	2015.00	0.0	2118.18	331.45
7.110	3510.00	971.47	12.97	1.00	10530.00	1818.83	0.0	1985.00	2015.00	0.0	2114.71	295.68
7.110	3510.00	972.35	13.65	1.00	10530.00	1925.00	1925.00	1985.00	2015.00	2092.00	2092.00	167.00
7.110	1640.00	968.98	10.29	1.00	10530.00	1903.03	0.0	1985.00	2015.00	0.0	2108.60	205.56
7.110	2890.00	970.92	12.23	1.00	10530.00	1842.42	0.0	1985.00	2015.00	0.0	2113.00	270.58
7.110	5250.00	973.45	14.75	1.00	10530.00	1784.33	0.0	1985.00	2015.00	0.0	2118.35	334.42
7.120	3510.00	971.75	13.05	9.00	10539.00	1816.60	0.0	1985.00	2015.00	0.0	2114.88	296.27
7.120	3510.00	972.42	13.72	9.00	10539.00	1925.00	1925.00	1985.00	2015.00	2092.00	2092.00	167.00
7.120	1640.00	969.08	10.38	9.00	10539.00	1899.63	0.0	1985.00	2015.00	0.0	2108.63	206.99
7.120	2690.00	971.00	12.30	9.00	10539.00	1839.96	0.0	1985.00	2015.00	0.0	2113.16	273.22
7.120	5250.00	973.51	14.81	9.00	10539.00	1783.87	0.0	1985.00	2015.00	0.0	2118.87	335.00
7.130	3510.00	971.75	13.05	1.00	10540.00	1816.38	0.0	1985.00	2015.00	0.0	2114.89	296.52
7.130	3510.00	972.42	13.73	1.00	10540.00	1925.00	1925.00	1985.00	2015.00	2092.00	2092.00	167.00
7.130	1640.00	969.09	10.39	1.00	10540.00	1899.55	0.0	1985.00	2015.00	0.0	2108.65	206.90
7.130	2890.00	971.00	12.30	1.00	10540.00	1839.73	0.0	1985.00	2015.00	0.0	2113.20	273.40
7.130	5250.00	973.51	14.81	1.00	10540.00	1783.74	0.0	1985.00	2015.00	0.0	2118.90	335.17

	SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID	
H	8.000	3510.00	972.14	11.94	125.00	10665.00	1804.33	0.0	1978.00	2016.00	0.0	2115.77	311.44	H
	8.000	3510.00	972.77	12.57	125.00	10665.00	1931.72	1931.72	1978.00	2016.00	2083.12	2083.12	151.40	
	8.000	1640.00	969.43	9.23	125.00	10665.00	1889.02	0.0	1978.00	2016.00	0.0	2109.81	220.79	
	8.000	2890.00	971.39	11.19	125.00	10665.00	1827.81	0.0	1978.00	2016.00	0.0	2114.06	286.26	
	8.000	5250.00	973.88	13.68	125.00	10665.00	1780.40	0.0	1978.00	2016.00	0.0	2119.73	339.33	
I	9.000	3510.00	974.03	11.53	1070.00	11735.00	1696.90	0.0	1985.00	2016.00	0.0	2177.21	476.31	I
	9.000	3510.00	974.82	12.32	1070.00	11735.00	1821.95	1821.95	1985.00	2016.00	2082.34	2082.34	260.39	
	9.000	1640.00	971.35	8.85	1070.00	11735.00	1753.00	0.0	1985.00	2016.00	0.0	2143.01	389.55	
	9.000	2890.00	973.27	10.77	1070.00	11735.00	1713.15	0.0	1985.00	2016.00	0.0	2168.48	455.33	
	9.000	5250.00	975.78	13.28	1070.00	11735.00	1683.51	0.0	1985.00	2016.00	0.0	2197.46	513.55	
	9.100	3510.00	974.50	10.80	188.00	11923.00	1694.77	0.0	1992.00	2009.00	0.0	2182.65	487.86	
	9.100	3510.00	975.36	11.66	188.00	11923.00	1803.49	1803.49	1992.00	2009.00	2090.21	2090.21	286.71	
	9.100	1640.00	971.97	8.27	188.00	11923.00	1748.28	0.0	1992.00	2009.00	0.0	2152.86	412.57	
	9.100	2890.00	973.77	10.07	188.00	11923.00	1702.75	0.0	1992.00	2009.00	0.0	2174.24	471.49	
	9.100	5250.00	976.21	12.51	188.00	11923.00	1679.76	0.0	1992.00	2009.00	0.0	2201.87	521.31	
	9.110	3510.00	974.55	10.85	1.00	11924.00	1694.28	0.0	1992.00	2009.00	0.0	2183.29	489.02	
	9.110	3510.00	975.41	11.71	1.00	11924.00	1800.31	1800.31	1992.00	2009.00	2093.12	2093.12	292.81	
	9.110	1640.00	972.10	8.40	1.00	11924.00	1737.58	0.0	1992.00	2009.00	0.0	2154.94	417.36	
	9.110	2890.00	973.83	10.13	1.00	11924.00	1701.36	0.0	1992.00	2009.00	0.0	2175.02	473.66	
	9.110	5250.00	976.25	12.55	1.00	11924.00	1679.39	0.0	1992.00	2009.00	0.0	2201.29	521.90	
	9.120	3510.00	974.60	10.90	12.00	11936.00	1693.94	0.0	1992.00	2009.00	0.0	2183.74	489.80	
	9.120	3510.00	975.46	11.78	12.00	11936.00	1799.97	1799.97	1992.00	2009.00	2093.32	2093.32	293.35	
	9.120	1640.00	972.19	8.49	12.00	11936.00	1735.84	0.0	1992.00	2009.00	0.0	2155.42	420.08	
	9.120	2890.00	973.89	10.19	12.00	11936.00	1700.43	0.0	1992.00	2009.00	0.0	2175.53	476.10	
	9.120	5250.00	976.28	12.58	12.00	11936.00	1679.12	0.0	1992.00	2009.00	0.0	2201.44	522.52	
	9.130	3510.00	974.57	10.87	1.00	11937.00	1694.15	0.0	1992.00	2009.00	0.0	2183.46	489.31	
	9.130	3510.00	975.44	11.74	1.00	11937.00	1802.54	1802.54	1992.00	2009.00	2090.89	2090.89	288.34	
	9.130	1640.00	972.13	8.43	1.00	11937.00	1736.82	0.0	1992.00	2009.00	0.0	2155.37	418.55	
	9.130	2890.00	973.85	10.15	1.00	11937.00	1701.00	0.0	1992.00	2009.00	0.0	2175.22	474.22	
	9.130	5250.00	976.26	12.56	1.00	11937.00	1679.28	0.0	1992.00	2009.00	0.0	2201.35	522.07	
J	10.000	3510.00	976.47	9.97	788.00	12725.00	1683.14	0.0	1980.00	2020.00	0.0	2026.51	365.37	J
	10.000	3510.00	977.39	10.89	788.00	12725.00	1836.14	1836.14	1980.00	2020.00	2026.60	2026.60	183.86	
	10.000	1640.00	974.30	7.80	788.00	12725.00	1764.51	0.0	1980.00	2020.00	0.0	2025.67	261.16	
	10.000	2890.00	975.85	9.35	788.00	12725.00	1687.65	0.0	1980.00	2020.00	0.0	2027.69	334.64	
	10.000	5250.00	977.99	11.49	788.00	12725.00	1646.59	0.0	1980.00	2020.00	0.0	2030.52	383.53	
	10.100	3510.00	979.72	10.52	1057.00	13782.00	1817.82	0.0	1969.00	2031.00	0.0	2035.84	218.02	
	10.100	3510.00	980.34	11.14	1057.00	13782.00	1915.00	1915.00	1969.00	2031.00	2031.00	2031.00	116.00	
	10.100	1640.00	976.96	7.76	1057.00	13782.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	59.00	
	10.100	2890.00	978.99	9.79	1057.00	13782.00	1827.56	0.0	1969.00	2031.00	0.0	2031.00	203.44	
	10.100	5250.00	981.35	12.15	1057.00	13782.00	1801.52	0.0	1969.00	2031.00	0.0	2072.15	270.63	
	10.110	3510.00	979.73	10.53	1.00	13783.00	1817.78	0.0	1969.00	2031.00	0.0	2035.53	218.15	
	10.110	3510.00	980.35	11.15	1.00	13783.00	1915.00	1915.00	1969.00	2031.00	2031.00	2031.00	116.00	
	10.110	1640.00	976.96	7.76	1.00	13783.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	59.00	
	10.110	2890.00	979.00	9.80	1.00	13783.00	1827.52	0.0	1969.00	2031.00	0.0	2031.00	203.48	
	10.110	5250.00	981.63	12.43	1.00	13783.00	1799.16	0.0	1969.00	2031.00	0.0	2078.49	275.32	

	SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID	
	10.120	3510.00	980.20	11.00	23.00	13806.00	1812.95	0.0	1969.00	2031.00	0.0	2046.68	233.73	
	10.120	3510.00	980.84	11.64	23.00	13806.00	1915.00	1915.00	1969.00	2031.00	2031.00	2031.00	116.00	
	10.120	1640.00	977.04	7.84	23.00	13806.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	59.00	
	10.120	2890.00	979.43	10.23	23.00	13806.00	1820.87	0.0	1969.00	2031.00	0.0	2031.00	210.13	

SECND	Q	CHSEL	DEPTH	XLCH	CUM DIS	STA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID
10.120	3510.00	980.20	11.00	23.00	13806.00	1812.95	0.0	1969.00	2031.00	0.0	2044.88	233.73
10.120	3510.00	980.84	11.64	23.00	13806.00	1915.00	1915.00	1969.00	2031.00	2031.00	2031.00	116.00
10.120	1640.00	977.04	7.84	23.00	13806.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	59.00
10.120	2890.00	979.42	10.22	23.00	13806.00	1820.82	0.0	1969.00	2031.00	0.0	2031.00	210.13
10.120	5250.00	981.96	12.76	23.00	13806.00	1797.12	0.0	1969.00	2031.00	0.0	2085.74	288.62
10.130	3510.00	980.20	11.00	1.00	13807.00	1812.91	0.0	1969.00	2031.00	0.0	2044.77	233.66
10.130	3510.00	980.96	11.76	1.00	13807.00	1915.00	1915.00	1969.00	2031.00	2031.00	2031.00	116.00
10.130	1640.00	977.04	7.84	1.00	13807.00	1969.00	0.0	1969.00	2031.00	0.0	2031.00	59.00
10.130	2890.00	979.50	10.30	1.00	13807.00	1820.82	0.0	1969.00	2031.00	0.0	2031.00	210.98
10.130	5250.00	981.91	12.71	1.00	13807.00	1797.43	0.0	1969.00	2031.00	0.0	2084.64	288.21
10.150	3510.00	980.23	11.23	50.00	13857.00	1957.52	0.0	1987.00	2010.00	0.0	2101.18	143.66
10.150	3510.00	980.99	11.99	50.00	13857.00	1980.91	1980.91	1987.00	2010.00	2066.00	2065.94	85.08
10.150	1640.00	977.15	8.15	50.00	13857.00	1975.74	0.0	1987.00	2010.00	0.0	2075.28	99.54
10.150	2890.00	979.55	10.55	50.00	13857.00	1962.47	0.0	1987.00	2010.00	0.0	2096.12	133.65
10.150	5250.00	981.90	12.90	50.00	13857.00	1940.07	0.0	1987.00	2010.00	0.0	2109.49	169.42
10.200	3510.00	984.39	11.09	1012.00	14869.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.200	3510.00	984.73	11.43	1012.00	14869.00	1968.00	1968.00	1968.00	2032.00	2032.00	2032.00	64.00
10.200	1640.00	980.85	7.55	1012.00	14869.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.200	2890.00	983.39	10.08	1012.00	14869.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.200	5250.00	986.74	13.44	1012.00	14869.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.210	3510.00	984.39	11.09	1.00	14870.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.210	3510.00	984.73	11.43	1.00	14870.00	1968.00	1968.00	1968.00	2032.00	2032.00	2032.00	64.00
10.210	1640.00	980.85	7.56	1.00	14870.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.210	2890.00	983.38	10.08	1.00	14870.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.210	5250.00	986.74	13.44	1.00	14870.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.220	3510.00	984.42	11.12	10.00	14880.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.220	3510.00	984.75	11.45	10.00	14880.00	1968.00	1968.00	1968.00	2032.00	2032.00	2032.00	64.00
10.220	1640.00	980.88	7.58	10.00	14880.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.220	2890.00	983.41	10.11	10.00	14880.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.220	5250.00	986.80	13.50	10.00	14880.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.230	3510.00	984.42	11.12	1.00	14881.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.230	3510.00	984.76	11.46	1.00	14881.00	1968.00	1968.00	1968.00	2032.00	2032.00	2032.00	64.00
10.230	1640.00	980.88	7.58	1.00	14881.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.230	2890.00	983.41	10.11	1.00	14881.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.230	5250.00	986.82	13.52	1.00	14881.00	1968.00	0.0	1968.00	2032.00	0.0	2032.00	64.00
10.250	3510.00	984.62	11.02	50.00	14931.00	1947.07	0.0	1969.00	2018.00	0.0	2109.05	197.97
10.250	3510.00	984.87	11.27	50.00	14931.00	1969.00	1969.00	1969.00	2018.00	2062.78	2062.78	92.78
10.250	1640.00	980.97	7.37	50.00	14931.00	1959.12	0.0	1969.00	2018.00	0.0	2077.57	118.35
10.250	2890.00	983.56	9.96	50.00	14931.00	1950.59	0.0	1969.00	2018.00	0.0	2102.74	152.15
10.250	5250.00	987.18	13.58	50.00	14931.00	1936.61	0.0	1969.00	2018.00	0.0	2110.60	171.99
11.000	3510.00	986.77	10.27	859.00	15790.00	1711.69	0.0	1975.00	2013.00	0.0	2026.04	316.35
11.000	3510.00	987.47	10.97	859.00	15790.00	1845.49	1845.49	1975.00	2013.00	2013.00	2013.00	167.51
11.000	1640.00	983.86	7.36	859.00	15790.00	1740.72	0.0	1975.00	2013.00	0.0	2017.36	276.56
11.000	2890.00	986.97	9.37	859.00	15790.00	1714.48	0.0	1975.00	2013.00	0.0	2024.65	310.21
11.000	5250.00	989.08	12.58	859.00	15790.00	1660.76	0.0	1975.00	2013.00	0.0	2032.81	344.41

	SECNO	Q	CWSEL	DEPTH	XLCH	CUM DIS	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	TOPWID	
L	12.000	2950.00	986.81	9.91	1000.00	16790.00	1952.92	0.0	1983.00	2028.00	0.0	2402.44	450.02	L
	12.000	2950.00	989.74	10.84	1000.00	16790.00	1983.00	1983.00	1983.00	2028.00	2237.67	2237.67	254.67	
	12.000	1380.00	986.53	7.63	1000.00	16790.00	1944.96	0.0	1983.00	2028.00	0.0	2391.25	426.24	
	12.000	2400.00	988.10	9.20	1000.00	16790.00	1956.70	0.0	1983.00	2028.00	0.0	2430.37	443.67	
	12.000	4400.00	990.70	11.80	1000.00	16790.00	1926.52	0.0	1983.00	2028.00	0.0	2409.76	483.24	
	12.100	2950.00	990.50	10.50	961.00	17751.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00	
	12.100	2950.00	991.33	11.33	961.00	17751.00	1979.00	1979.00	1979.00	2022.00	2022.00	2022.00	43.00	
	12.100	1380.00	988.23	8.23	961.00	17751.00	1979.00	0.0	1979.00	2022.00	0.0	2020.85	41.85	
	12.100	2400.00	989.84	9.84	961.00	17751.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00	
	12.100	4400.00	991.96	11.96	961.00	17751.00	1979.00	0.0	1979.00	2022.00	0.0	2130.59	138.20	
	12.110	2950.00	990.51	10.51	1.00	17752.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00	
	12.110	2950.00	991.33	11.33	1.00	17752.00	1979.00	1979.00	1979.00	2022.00	2022.00	2022.00	43.00	
	12.110	1380.00	988.24	8.24	1.00	17752.00	1979.00	0.0	1979.00	2022.00	0.0	2020.86	41.86	
	12.110	2400.00	989.85	9.85	1.00	17752.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00	
	12.110	4400.00	991.98	11.98	1.00	17752.00	1979.00	0.0	1979.00	2022.00	0.0	2130.76	138.61	
	12.120	2950.00	990.76	10.76	16.00	17768.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00	
	12.120	2950.00	991.59	11.59	16.00	17768.00	1979.00	1979.00	1979.00	2022.00	2022.00	2022.00	43.00	
	12.120	1380.00	988.28	8.28	16.00	17768.00	1979.00	0.0	1979.00	2022.00	0.0	2020.90	41.90	
	12.120	2400.00	990.01	10.01	16.00	17768.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00	
	12.120	4400.00	993.99	13.99	16.00	17768.00	1843.19	0.0	1979.00	2022.00	0.0	2166.72	323.54	
	12.130	2950.00	991.17	11.17	1.00	17769.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00	
	12.130	2950.00	992.13	12.13	1.00	17769.00	1979.00	1979.00	1979.00	2022.00	2022.00	2022.00	43.00	
	12.130	1380.00	988.29	8.29	1.00	17769.00	1979.00	0.0	1979.00	2022.00	0.0	2020.91	41.91	
	12.130	2400.00	990.16	10.16	1.00	17769.00	1979.00	0.0	1979.00	2022.00	0.0	2022.00	43.00	
	12.130	4400.00	994.19	14.19	1.00	17769.00	1838.36	0.0	1979.00	2022.00	0.0	2168.63	329.27	
	12.150	2950.00	991.35	11.76	50.00	17819.00	1965.70	0.0	1986.00	2013.00	0.0	2086.36	122.66	
	12.150	2950.00	992.26	12.66	50.00	17819.00	1976.95	1976.95	1986.00	2013.00	2051.42	2051.42	74.47	
	12.150	1380.00	988.39	8.79	50.00	17819.00	1974.16	0.0	1986.00	2013.00	0.0	2041.53	67.37	
	12.150	2400.00	990.32	10.72	50.00	17819.00	1968.66	0.0	1986.00	2013.00	0.0	2071.96	103.30	
	12.150	4400.00	994.34	14.74	50.00	17819.00	1862.33	0.0	1986.00	2013.00	0.0	2235.50	373.17	
M	13.000	2950.00	994.90	11.10	806.00	18625.00	1841.39	0.0	1982.00	2020.00	0.0	2078.91	187.51	M
	13.000	2950.00	995.58	11.78	806.00	18625.00	1916.54	1916.54	1982.00	2020.00	2020.00	2020.00	105.46	
	13.000	1380.00	991.71	7.91	806.00	18625.00	1867.18	0.0	1982.00	2020.00	0.0	2023.11	155.93	
	13.000	2400.00	993.92	10.12	806.00	18625.00	1848.82	0.0	1982.00	2020.00	0.0	2027.11	178.29	
	13.000	4400.00	997.13	13.33	806.00	18625.00	1801.00	0.0	1982.00	2020.00	0.0	2032.56	231.56	
N	14.000	2950.00	996.70	11.00	895.00	19520.00	1841.45	0.0	1976.00	2013.00	0.0	2097.44	256.99	N
	14.000	2950.00	997.63	11.93	895.00	19520.00	1915.29	1915.29	1976.00	2013.00	2050.90	2050.90	135.61	
	14.000	1380.00	993.87	8.17	895.00	19520.00	1849.79	0.0	1976.00	2013.00	0.0	2059.52	224.73	
	14.000	2400.00	995.80	10.10	895.00	19520.00	1844.09	0.0	1976.00	2013.00	0.0	2094.62	250.63	
	14.000	4400.00	998.79	13.09	895.00	19520.00	1835.30	0.0	1976.00	2013.00	0.0	2134.27	299.57	
O	15.000	2950.00	998.01	11.41	650.00	20210.00	1914.55	0.0	1973.00	2016.00	0.0	2116.26	201.78	O
	15.000	2950.00	999.03	12.43	650.00	20210.00	1973.00	1973.00	1973.00	2016.00	2083.85	2083.85	110.65	
	15.000	1380.00	995.31	8.71	650.00	20210.00	1939.01	0.0	1973.00	2016.00	0.0	2109.65	170.63	
	15.000	2400.00	997.16	10.56	650.00	20210.00	1915.49	0.0	1973.00	2016.00	0.0	2114.19	197.70	
	15.000	4400.00	999.98	13.38	650.00	20210.00	1910.03	0.0	1973.00	2016.00	0.0	2121.11	211.08	

100 YR FLOOD-29-DCR-CHAR

SUMMARY PRINTOUT

100 YR FLOOD-29-DCK-CHAR

SUMMARY PRINTOUT

SECNO	XLCH	ELMIN	KRCHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
0.010	300.00	935.60	0.0	0.0	0.0	945.18	0.0	0.0	-14.82	946.30	0.0	0.0
0.010	300.00	935.60	0.0	0.0	0.0	945.18	0.00	0.0	0.00	946.30	0.00	1.40
0.010	300.00	935.60	0.0	0.0	0.0	941.97	-3.21	0.0	-18.04	942.69	-3.61	0.0
0.010	300.00	935.60	0.0	0.0	0.0	944.19	2.22	0.0	-15.81	945.19	2.11	0.0
0.010	300.00	935.60	0.0	0.0	0.0	947.36	3.16	0.0	-12.64	948.76	3.45	0.0
0.100	422.00	938.10	5.92	0.0	0.0	946.44	0.0	1.26	0.0	946.58	0.0	0.0
0.100	422.00	938.10	5.92	0.0	0.0	946.44	0.00	1.26	0.00	946.58	0.00	5.10
0.100	422.00	938.10	5.92	0.0	0.0	943.38	-3.06	1.41	0.0	944.24	-3.04	0.0
0.100	422.00	938.10	5.92	0.0	0.0	945.52	2.14	1.33	0.0	946.88	-1.20	0.0
0.100	422.00	938.10	5.92	0.0	0.0	948.38	2.85	1.02	0.0	950.21	2.73	0.0
0.110	1.00	938.10	0.0	951.50	947.60	946.45	0.0	0.01	0.0	946.59	0.0	0.0
0.110	1.00	938.10	0.0	951.50	947.60	946.45	0.00	0.01	0.00	946.59	0.00	9.10
0.110	1.00	938.10	0.0	951.50	947.60	943.39	-3.06	0.01	0.0	944.24	-3.05	0.0
0.110	1.00	938.10	0.0	951.50	947.60	945.53	2.14	0.01	0.0	946.89	-1.20	0.0
0.110	1.00	938.10	0.0	951.50	947.60	948.39	2.86	0.01	0.0	951.23	3.14	0.0
0.120	14.00	938.10	0.0	951.50	947.60	946.67	0.0	0.21	0.0	946.22	0.0	0.0
0.120	14.00	938.10	0.0	951.50	947.60	946.67	0.00	0.21	0.00	946.22	0.00	9.10
0.120	14.00	938.10	0.0	951.50	947.60	943.53	-3.13	0.24	0.0	944.24	-3.05	0.0
0.120	14.00	938.10	0.0	951.50	947.60	945.71	2.18	0.18	0.0	946.88	-1.20	0.0
0.120	14.00	938.10	0.0	951.50	947.60	948.69	2.98	0.16	0.0	951.53	3.81	0.0
0.130	1.00	938.10	0.0	0.0	0.0	946.67	0.0	0.01	0.0	946.23	0.0	0.0
0.130	1.00	938.10	0.0	0.0	0.0	946.67	0.00	0.01	0.00	946.23	0.00	9.10
0.130	1.00	938.10	0.0	0.0	0.0	943.54	-3.13	0.01	0.0	944.25	-3.05	0.0
0.130	1.00	938.10	0.0	0.0	0.0	945.72	2.18	0.01	0.0	947.01	-1.22	0.0
0.130	1.00	938.10	0.0	0.0	0.0	949.74	4.02	1.05	0.0	951.64	3.41	0.0
0.150	41.00	938.50	9.77	0.0	0.0	946.95	0.0	0.27	0.0	946.96	0.0	0.0
0.150	41.00	938.50	9.77	0.0	0.0	946.49	0.05	0.32	0.05	946.23	0.01	9.10
0.150	41.00	938.50	9.77	0.0	0.0	943.83	-3.16	0.29	0.0	945.24	-3.72	0.0
0.150	41.00	938.50	9.77	0.0	0.0	946.99	2.16	0.27	0.0	947.78	-1.47	0.0
0.150	41.00	938.50	9.77	0.0	0.0	949.90	3.91	0.15	0.0	951.44	2.66	0.0
0.160	25.00	938.70	7.99	0.0	0.0	947.85	0.0	0.92	0.0	946.96	0.0	0.0
0.160	25.00	938.70	7.99	0.0	0.0	947.15	-0.71	0.16	-0.71	946.39	-0.57	9.10
0.160	25.00	938.70	7.99	0.0	0.0	944.92	-2.24	1.09	0.0	945.82	-3.63	0.0
0.160	25.00	938.70	7.99	0.0	0.0	946.82	1.90	0.83	0.0	948.24	-1.21	0.0
0.160	25.00	938.70	7.99	0.0	0.0	951.61	4.79	1.71	0.0	952.26	2.64	0.0
0.200	25.00	938.80	3.99	0.0	0.0	947.99	0.0	0.12	0.0	948.38	0.0	0.0
0.200	25.00	938.80	3.99	0.0	0.0	948.08	0.09	0.93	0.09	948.92	0.04	9.10
0.200	25.00	938.80	3.99	0.0	0.0	945.05	-3.03	0.13	0.0	946.03	-3.55	0.0
0.200	25.00	938.80	3.99	0.0	0.0	946.96	1.91	0.14	0.0	948.38	-1.30	0.0
0.200	25.00	938.80	3.99	0.0	0.0	951.68	4.72	0.07	0.0	952.31	2.73	0.0
0.210	1.00	938.80	0.0	950.30	948.60	948.00	0.0	0.01	0.0	951.32	0.0	0.0
0.210	1.00	938.80	0.0	950.30	948.60	948.09	0.10	0.01	0.10	951.43	0.11	9.10
0.210	1.00	938.80	0.0	950.30	948.60	945.05	-3.04	0.01	0.0	946.29	-5.14	0.0
0.210	1.00	938.80	0.0	950.30	948.60	948.97	1.91	0.01	0.0	948.93	-2.42	0.0
0.210	1.00	938.80	0.0	950.30	948.60	952.67	5.40	0.69	0.0	952.62	1.30	0.0

SECNO	XLCH	ELMIN	K*CHSL	ELTRD	ELLC	CHSEL	DIFWSP	DIFWSY	DIFKWS	EG	DIFEG	INPUT E
0.220	49.00	938.80	0.0	950.30	948.60	951.83	0.0	0.06	0.0	952.01	0.0	0.0
0.220	49.00	938.80	0.0	950.30	948.60	949.99	-1.84	1.84	-1.84	952.83	0.82	-15.40
0.220	49.00	938.80	0.0	950.30	948.60	945.55	-4.44	0.60	0.0	946.42	-5.42	0.0
0.220	49.00	938.80	0.0	950.30	948.60	947.73	2.18	0.76	0.0	949.45	-2.57	0.0
0.220	49.00	938.80	0.0	950.30	948.60	952.08	4.35	0.31	0.0	952.87	0.85	0.0
0.230	1.00	938.80	0.0	0.0	0.0	951.77	0.0	-0.05	0.0	952.04	0.0	0.0
0.230	1.00	938.80	0.0	0.0	0.0	952.56	0.79	2.57	0.79	955.07	1.04	19.40
0.230	1.00	938.80	0.0	0.0	0.0	945.76	-6.80	0.21	0.0	946.52	-5.52	0.0
0.230	1.00	938.80	0.0	0.0	0.0	948.40	2.64	0.67	0.0	949.51	-2.52	0.0
0.230	1.00	938.80	0.0	0.0	0.0	952.54	4.14	-0.14	0.0	952.93	0.89	0.0
0.250	50.00	938.20	-12.00	0.0	0.0	951.83	0.0	0.06	0.0	953.00	0.0	0.0
0.250	50.00	938.20	-12.00	0.0	0.0	952.64	0.81	0.06	0.81	953.70	0.71	2.40
0.250	50.00	938.20	-12.00	0.0	0.0	945.98	-6.66	0.21	0.0	947.21	-5.71	0.0
0.250	50.00	938.20	-12.00	0.0	0.0	948.61	2.63	0.21	0.0	950.50	-2.50	0.0
0.250	50.00	938.20	-12.00	0.0	0.0	952.63	4.03	0.09	0.0	954.62	3.62	0.0
0.300	359.00	940.40	6.13	0.0	0.0	953.56	0.0	1.73	0.0	953.97	0.0	0.0
0.300	359.00	940.40	6.13	0.0	0.0	954.14	0.58	1.50	0.58	954.57	0.61	5.40
0.300	359.00	940.40	6.13	0.0	0.0	948.23	-5.86	2.29	0.0	949.01	-4.95	0.0
0.300	359.00	940.40	6.13	0.0	0.0	951.38	3.11	2.77	0.0	952.38	-1.67	0.0
0.300	359.00	940.40	6.13	0.0	0.0	955.78	4.40	3.14	0.0	956.03	2.06	0.0
0.310	1.00	940.40	0.0	949.70	947.90	953.88	0.0	0.33	0.0	954.08	0.0	0.0
0.310	1.00	940.40	0.0	949.70	947.90	954.32	0.43	0.18	0.43	954.64	0.56	5.40
0.310	1.00	940.40	0.0	949.70	947.90	948.28	-6.04	0.00	0.0	949.11	-4.96	0.0
0.310	1.00	940.40	0.0	949.70	947.90	951.39	3.11	0.00	0.0	952.48	-1.59	0.0
0.310	1.00	940.40	0.0	949.70	947.90	955.98	4.59	0.20	0.0	956.10	2.02	0.0
0.320	20.00	940.40	0.0	949.70	947.90	953.95	0.0	0.06	0.0	954.13	0.0	0.0
0.320	20.00	940.40	0.0	949.70	947.90	954.41	0.46	0.04	0.46	954.71	0.58	9.40
0.320	20.00	940.40	0.0	949.70	947.90	948.44	-5.97	0.16	0.0	949.27	-4.88	0.0
0.320	20.00	940.40	0.0	949.70	947.90	952.58	4.13	1.16	0.0	952.99	-1.14	0.0
0.320	20.00	940.40	0.0	949.70	947.90	956.31	3.45	0.03	0.0	956.12	1.99	0.0
0.330	1.00	940.40	0.0	0.0	0.0	953.90	0.0	-0.04	0.0	954.23	0.0	0.0
0.330	1.00	940.40	0.0	0.0	0.0	954.36	0.46	-0.03	0.46	954.79	0.55	7.40
0.330	1.00	940.40	0.0	0.0	0.0	948.71	-5.67	0.23	0.0	949.36	-4.87	0.0
0.330	1.00	940.40	0.0	0.0	0.0	952.54	3.82	-0.03	0.0	953.06	-1.18	0.0
0.330	1.00	940.40	0.0	0.0	0.0	955.98	3.44	-0.03	0.0	956.20	1.97	0.0
0.350	50.00	941.10	14.00	0.0	0.0	954.19	0.0	0.27	0.0	954.35	0.0	0.0
0.350	50.00	941.10	14.00	0.0	0.0	954.70	0.51	0.32	0.51	954.92	0.57	15.40
0.350	50.00	941.10	14.00	0.0	0.0	948.82	-5.88	0.11	0.0	949.50	-4.85	0.0
0.350	50.00	941.10	14.00	0.0	0.0	953.07	4.25	0.54	0.0	953.26	-1.69	0.0
0.350	50.00	941.10	14.00	0.0	0.0	956.11	3.04	0.14	0.0	956.27	1.92	0.0
0.400	342.00	941.30	0.58	0.0	0.0	954.44	0.0	0.24	0.0	954.51	0.0	0.0
0.400	342.00	941.30	0.58	0.0	0.0	954.92	0.48	0.42	0.48	955.13	0.67	35.40
0.400	342.00	941.30	0.58	0.0	0.0	950.06	-4.86	1.23	0.0	950.22	-4.19	0.0
0.400	342.00	941.30	0.58	0.0	0.0	953.39	3.33	0.31	0.0	953.46	-1.05	0.0
0.400	342.00	941.30	0.58	0.0	0.0	956.32	2.94	0.21	0.0	956.41	1.90	0.0

SECNO	XLCH	ELMIN	K*CHSL	ELTRD	ELLC	CHSEL	DIFWSP	DIFWSY	DIFKWS	EG	DIFEG	INPUT E
0.410	1.00	941.30	0.0	945.80	944.80	954.48	0.0	0.04	0.0	954.52	0.0	0.0
0.410	1.00	941.30	0.0	945.80	944.80	955.05	0.57	0.13	0.57	955.22	0.70	48.40
0.410	1.00	941.30	0.0	945.80	944.80	950.18	-4.87	0.12	0.0	950.28	-4.26	0.0
0.410	1.00	941.30	0.0	945.80	944.80	953.43	3.25	0.04	0.0	953.47	-1.05	0.0

	SECNO	XLOC	ELMIN	K*CHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFWMS	EG	DIFEG	INPUT E	
	0.410	1.00	941.30	0.0	945.80	944.80	954.48	0.0	0.04	0.0	954.52	0.0	0.0	
	0.410	1.00	941.30	0.0	945.80	944.80	955.05	0.57	0.13	0.57	955.22	0.70	40.40	
	0.410	1.00	941.30	0.0	945.80	944.80	950.18	-4.87	0.1	0.0	950.26	-4.26	0.0	
	0.410	1.00	941.30	0.0	945.80	944.80	953.41	3.25	0.04	0.0	953.47	-1.05	0.0	
	0.410	1.00	941.30	0.0	945.80	944.80	956.37	2.94	0.04	0.0	956.43	1.91	0.0	
	0.420	11.00	941.30	0.0	945.80	944.80	954.48	0.0	0.00	0.0	954.53	0.0	0.0	
	0.420	11.00	941.30	0.0	945.80	944.80	955.06	0.58	0.01	0.58	955.23	0.71	40.40	
	0.420	11.00	941.30	0.0	945.80	944.80	950.20	-4.86	0.02	0.0	950.27	-4.25	0.0	
	0.420	11.00	941.30	0.0	945.80	944.80	953.43	3.24	0.00	0.0	953.48	-1.03	0.0	
	0.420	11.00	941.30	0.0	945.80	944.80	956.37	2.94	0.00	0.0	956.43	1.91	0.0	
	0.430	1.00	941.30	0.0	0.0	0.0	954.47	0.0	-0.01	0.0	954.54	0.0	0.0	
	0.430	1.00	941.30	0.0	0.0	0.0	955.04	0.57	-0.02	0.57	955.28	0.74	35.40	
	0.430	1.00	941.30	0.0	0.0	0.0	950.18	-4.86	-0.02	0.0	950.32	-4.22	0.0	
	0.430	1.00	941.30	0.0	0.0	0.0	953.43	3.25	-0.01	0.0	953.53	-1.05	0.0	
	0.430	1.00	941.30	0.0	0.0	0.0	956.36	2.94	-0.01	0.0	956.45	1.91	0.0	
A	1.000	819.00	941.70	0.49	0.0	0.0	954.71	0.0	0.23	0.0	954.74	0.0	0.0	A
	1.000	819.00	941.70	0.49	0.0	0.0	955.55	0.84	0.91	0.84	955.60	0.86	12.40	
	1.000	819.00	941.70	0.49	0.0	0.0	950.78	-4.77	0.60	0.0	950.87	-3.87	0.0	
	1.000	819.00	941.70	0.49	0.0	0.0	953.68	2.90	0.26	0.0	953.72	-1.02	0.0	
	1.000	819.00	941.70	0.49	0.0	0.0	956.62	2.93	0.25	0.0	956.65	1.91	0.0	
B	2.000	760.00	943.40	2.24	0.0	0.0	954.95	0.0	0.24	0.0	955.45	0.0	0.0	B
	2.000	760.00	943.40	2.24	0.0	0.0	955.83	0.88	0.24	0.88	955.94	0.90	9.40	
	2.000	760.00	943.40	2.24	0.0	0.0	951.52	-4.31	0.74	0.0	951.77	-3.26	0.0	
	2.000	760.00	943.40	2.24	0.0	0.0	953.97	2.45	0.29	0.0	954.02	-0.97	0.0	
	2.000	760.00	943.40	2.24	0.0	0.0	956.84	2.87	0.22	0.0	956.94	1.84	0.0	
	2.100	802.00	944.40	1.25	0.0	0.0	955.82	0.0	0.97	0.0	956.92	0.0	0.0	
	2.100	802.00	944.40	1.25	0.0	0.0	956.81	0.98	0.97	0.98	957.70	0.78	8.40	
	2.100	802.00	944.40	1.25	0.0	0.0	953.77	-3.03	2.25	0.0	954.17	-2.75	0.0	
	2.100	802.00	944.40	1.25	0.0	0.0	955.18	1.41	1.21	0.0	956.34	-0.68	0.0	
	2.100	802.00	944.40	1.25	0.0	0.0	957.63	2.45	0.79	0.0	958.47	1.56	0.0	
	2.110	1.00	944.40	0.0	958.80	958.00	955.83	0.0	0.01	0.0	956.92	0.0	0.0	
	2.110	1.00	944.40	0.0	958.80	958.00	956.80	0.97	-0.01	0.97	957.71	0.79	9.15	
	2.110	1.00	944.40	0.0	958.80	958.00	953.78	-3.02	0.38	0.0	954.17	-2.75	0.0	
	2.110	1.00	944.40	0.0	958.80	958.00	955.19	1.41	0.40	0.0	956.34	-0.83	0.0	
	2.110	1.00	944.40	0.0	958.80	958.00	957.91	2.73	0.28	0.0	958.51	1.58	0.0	
	2.120	14.00	944.40	0.0	958.80	958.00	955.97	0.0	0.14	0.0	957.03	0.0	0.0	
	2.120	14.00	944.40	0.0	958.80	958.00	956.91	0.95	0.12	0.95	957.61	0.79	9.10	
	2.120	14.00	944.40	0.0	958.80	958.00	953.82	-3.09	0.34	0.0	954.21	-2.52	0.0	
	2.120	14.00	944.40	0.0	958.80	958.00	955.29	1.47	0.10	0.0	956.12	-0.90	0.0	
	2.120	14.00	944.40	0.0	958.80	958.00	957.14	2.85	0.23	0.0	958.07	1.85	0.0	
	2.130	1.00	944.40	0.0	0.0	0.0	955.97	0.0	0.11	0.0	957.03	0.0	0.0	
	2.130	1.00	944.40	0.0	0.0	0.0	956.98	1.01	0.07	1.01	957.65	0.61	6.45	
	2.130	1.00	944.40	0.0	0.0	0.0	953.83	-3.16	0.38	0.0	954.21	-2.82	0.0	
	2.130	1.00	944.40	0.0	0.0	0.0	955.30	1.47	0.01	0.0	956.13	-0.90	0.0	
	2.130	1.00	944.40	0.0	0.0	0.0	956.15	2.85	0.01	0.0	956.82	1.79	0.0	

SECND	XLCH	ELMIN	KPCHSL	ELTRD	ELLC	CHSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
2.150	50.00	944.70	6.00	0.0	0.0	956.87	0.0	0.90	0.0	957.28	0.0	0.0
2.150	50.00	944.70	6.00	0.0	0.0	952.68	0.81	0.70	0.81	956.09	0.81	10.40
2.150	50.00	944.70	6.00	0.0	0.0	953.97	-3.71	0.15	0.0	954.35	-2.93	0.0
2.150	50.00	944.70	6.00	0.0	0.0	955.92	1.95	0.63	0.0	956.35	-0.53	0.0
2.150	50.00	944.70	6.00	0.0	0.0	958.54	2.62	0.39	0.0	959.00	1.72	0.0
3.000	807.00	946.00	1.61	0.0	0.0	958.69	0.0	1.82	0.0	959.19	0.0	0.0
3.000	807.00	946.00	1.61	0.0	0.0	959.63	0.94	1.55	0.94	960.15	0.96	6.40
3.000	807.00	946.00	1.61	0.0	0.0	955.78	-3.85	1.81	0.0	956.67	-3.12	0.0
3.000	807.00	946.00	1.61	0.0	0.0	957.82	2.04	1.90	0.0	958.27	-0.93	0.0
3.000	807.00	946.00	1.61	0.0	0.0	960.49	2.67	1.95	0.0	962.17	1.98	0.0
4.000	895.00	949.70	4.13	0.0	0.0	960.62	0.0	1.93	0.0	960.45	0.0	0.0
4.000	895.00	949.70	4.13	0.0	0.0	961.37	0.75	1.74	0.75	962.74	0.79	6.40
4.000	895.00	949.70	4.13	0.0	0.0	957.47	-3.90	1.69	0.0	957.73	-3.22	0.0
4.000	895.00	949.70	4.13	0.0	0.0	959.70	2.23	1.48	0.0	960.01	-0.94	0.0
4.000	895.00	949.70	4.13	0.0	0.0	962.66	2.96	2.17	0.0	963.01	2.06	0.0
4.100	792.00	951.10	1.77	0.0	0.0	962.24	0.0	1.62	0.0	962.91	0.0	0.0
4.100	792.00	951.10	1.77	0.0	0.0	962.89	0.65	1.52	0.65	963.49	0.57	9.40
4.100	792.00	951.10	1.77	0.0	0.0	959.06	-3.84	1.59	0.0	959.35	-3.56	0.0
4.100	792.00	951.10	1.77	0.0	0.0	961.33	2.28	1.63	0.0	961.87	-1.04	0.0
4.100	792.00	951.10	1.77	0.0	0.0	964.22	2.88	1.56	0.0	964.93	3.02	0.0
4.110	1.00	951.10	0.0	963.60	962.40	962.25	0.0	0.00	0.0	962.91	0.0	0.0
4.110	1.00	951.10	0.0	963.60	962.40	962.86	0.61	-0.03	0.61	963.51	0.59	9.10
4.110	1.00	951.10	0.0	963.60	962.40	959.06	-3.80	0.00	0.0	959.35	-3.56	0.0
4.110	1.00	951.10	0.0	963.60	962.40	961.34	2.28	0.00	0.0	961.88	-1.04	0.0
4.110	1.00	951.10	0.0	963.60	962.40	964.22	2.88	0.00	0.0	964.93	3.02	0.0
4.120	33.00	951.10	0.0	963.60	962.40	962.37	0.0	0.13	0.0	963.02	0.0	0.0
4.120	33.00	951.10	0.0	963.60	962.40	963.08	0.70	0.22	0.70	963.72	0.70	9.10
4.120	33.00	951.10	0.0	963.60	962.40	959.13	-3.94	0.07	0.0	959.42	-3.60	0.0
4.120	33.00	951.10	0.0	963.60	962.40	961.45	2.31	0.11	0.0	961.97	-1.05	0.0
4.120	33.00	951.10	0.0	963.60	962.40	964.71	3.27	0.40	0.0	965.23	3.20	0.0
4.130	1.00	951.10	0.0	0.0	0.0	962.38	0.0	0.00	0.0	963.03	0.0	0.0
4.130	1.00	951.10	0.0	0.0	0.0	963.17	0.79	0.10	0.79	963.74	0.71	9.10
4.130	1.00	951.10	0.0	0.0	0.0	959.13	-4.04	0.00	0.0	959.42	-3.60	0.0
4.130	1.00	951.10	0.0	0.0	0.0	961.45	2.31	0.00	0.0	961.98	-1.05	0.0
4.130	1.00	951.10	0.0	0.0	0.0	964.69	3.24	-0.03	0.0	965.24	3.22	0.0
4.150	50.00	951.40	6.00	0.0	0.0	962.61	0.0	0.24	0.0	963.17	0.0	0.0
4.150	50.00	951.40	6.00	0.0	0.0	963.33	0.72	0.16	0.72	963.89	0.68	2.40
4.150	50.00	951.40	6.00	0.0	0.0	959.17	-4.16	0.03	0.0	959.47	-3.58	0.0
4.150	50.00	951.40	6.00	0.0	0.0	961.58	2.41	0.13	0.0	962.11	-1.76	0.0
4.150	50.00	951.40	6.00	0.0	0.0	964.74	3.16	0.05	0.0	965.40	2.23	0.0
5.000	673.00	952.80	2.08	0.0	0.0	964.42	0.0	1.81	0.0	964.86	0.0	0.0
5.000	673.00	952.80	2.08	0.0	0.0	964.86	0.44	1.53	0.44	965.43	0.40	1.40
5.000	673.00	952.80	2.08	0.0	0.0	961.19	-3.67	2.02	0.0	962.81	-3.46	0.0
5.000	673.00	952.80	2.08	0.0	0.0	963.46	2.29	1.90	0.0	964.08	-0.99	0.0
5.000	673.00	952.80	2.08	0.0	0.0	966.49	3.01	1.75	0.0	967.13	2.11	0.0

SECND	XLCH	ELMIN	KPCHSL	ELTRD	ELLC	CHSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
6.000	1300.00	956.60	2.92	0.0	0.0	967.35	0.0	2.94	0.0	967.47	0.0	0.0
6.000	1300.00	956.60	2.92	0.0	0.0	968.01	0.65	3.15	0.65	968.20	0.74	13.40
6.000	1300.00	956.60	2.92	0.0	0.0	964.40	-3.61	3.21	0.0	964.50	-2.96	0.0

	SECND	XLEN	ELMIN	K*CHSL	ELTRD	ELLC	CHSEL	DIFHSP	DIFHSY	DIFHWS	EG	DIFEG	INPUT E	
F	6.000	1300.00	956.60	2.92	0.0	0.0	967.35	0.0	2.94	0.0	967.47	0.0	0.0	F
	6.000	1300.00	956.60	2.92	0.0	0.0	968.01	0.65	3.15	0.65	968.20	0.74	11.40	
	6.000	1300.00	956.60	2.92	0.0	0.0	964.40	-3.61	3.21	0.0	964.50	-2.96	0.0	
	6.000	1300.00	956.60	2.92	0.0	0.0	966.48	2.08	3.01	0.0	966.59	-0.88	0.0	
	6.000	1300.00	956.60	2.92	0.0	0.0	969.28	2.80	2.79	0.0	969.42	1.55	0.0	
G	7.000	905.00	958.50	2.10	0.0	0.0	968.64	0.0	1.28	0.0	968.83	0.0	0.0	G
	7.000	905.00	958.50	2.10	0.0	0.0	969.51	0.87	1.50	0.07	969.71	0.88	6.40	
	7.000	905.00	958.50	2.10	0.0	0.0	966.06	-3.45	1.66	0.0	966.25	-2.58	0.0	
	7.000	905.00	958.50	2.10	0.0	0.0	967.85	1.79	1.36	0.0	968.04	-0.79	0.0	
	7.000	905.00	958.50	2.10	0.0	0.0	970.50	2.65	1.22	0.0	970.71	1.88	6.0	
	7.100	1209.00	958.70	0.17	0.0	0.0	971.45	0.0	2.82	0.0	971.67	0.0	0.0	
	7.100	1209.00	958.70	0.17	0.0	0.0	972.14	0.70	2.65	0.70	972.59	0.72	5.10	
	7.100	1209.00	958.70	0.17	0.0	0.0	968.94	-3.21	2.88	0.0	969.24	-2.63	0.0	
	7.100	1209.00	958.70	0.17	0.0	0.0	970.74	1.79	2.69	0.0	971.13	-0.74	0.0	
	7.100	1209.00	958.70	0.17	0.0	0.0	973.19	2.45	2.68	0.0	973.63	1.76	0.0	
	7.110	1.00	958.70	0.0	968.50	967.00	971.67	0.0	0.42	0.0	971.79	0.0	0.0	
	7.110	1.00	958.70	0.0	968.50	967.00	972.35	0.68	0.14	0.68	972.62	0.72	5.10	
	7.110	1.00	958.70	0.0	968.50	967.00	968.98	-3.37	0.04	0.0	969.25	-2.64	0.0	
	7.110	1.00	958.70	0.0	968.50	967.00	970.92	1.94	0.18	0.0	971.15	-0.74	0.0	
	7.110	1.00	958.70	0.0	968.50	967.00	973.45	2.53	0.26	0.0	973.69	1.76	0.0	
	7.120	9.00	958.70	0.0	968.50	967.00	971.75	0.0	0.07	0.0	971.96	0.0	0.0	
	7.120	9.00	958.70	0.0	968.50	967.00	972.42	0.67	0.07	0.67	972.67	0.72	5.10	
	7.120	9.00	958.70	0.0	968.50	967.00	969.08	-3.34	0.10	0.0	969.33	-2.63	0.0	
	7.120	9.00	958.70	0.0	968.50	967.00	971.00	1.91	0.08	0.0	971.22	-0.74	0.0	
	7.120	9.00	958.70	0.0	968.50	967.00	973.51	2.51	0.06	0.0	973.71	1.75	0.0	
	7.130	1.00	958.70	0.0	0.0	0.0	971.75	0.0	0.03	0.0	972.11	0.0	0.0	
	7.130	1.00	958.70	0.0	0.0	0.0	972.42	0.68	0.00	0.68	972.82	0.71	5.10	
	7.130	1.00	958.70	0.0	0.0	0.0	969.09	-3.34	0.00	0.0	969.36	-2.75	0.0	
	7.130	1.00	958.70	0.0	0.0	0.0	971.00	1.91	0.00	0.0	971.35	-0.77	0.0	
	7.130	1.00	958.70	0.0	0.0	0.0	973.51	2.51	0.00	0.0	973.93	1.79	0.0	
H	8.000	125.00	960.20	12.00	0.0	0.0	972.14	0.0	0.39	0.0	972.40	0.0	0.0	H
	8.000	125.00	960.20	12.00	0.0	0.0	972.77	0.63	0.35	0.63	973.11	0.71	6.40	
	8.000	125.00	960.20	12.00	0.0	0.0	969.53	-3.34	0.34	0.0	969.81	-2.74	0.0	
	8.000	125.00	960.20	12.00	0.0	0.0	971.39	1.96	0.38	0.0	971.83	-0.77	0.0	
	8.000	125.00	960.20	12.00	0.0	0.0	973.89	2.50	0.37	0.0	974.20	1.79	0.0	
I	9.000	1070.00	962.50	2.15	0.0	0.0	974.03	0.0	1.64	0.0	974.18	0.0	0.0	I
	9.000	1070.00	962.50	2.15	0.0	0.0	974.92	0.79	2.05	0.79	975.04	0.86	10.40	
	9.000	1070.00	962.50	2.15	0.0	0.0	971.35	-3.47	1.92	0.0	971.54	-2.64	0.0	
	9.000	1070.00	962.50	2.15	0.0	0.0	973.27	1.92	1.88	0.0	973.45	-0.75	0.0	
	9.000	1070.00	962.50	2.15	0.0	0.0	975.78	2.51	1.83	0.0	975.94	1.75	0.0	
	9.100	188.00	963.70	6.38	0.0	0.0	974.89	0.0	0.47	0.0	974.99	0.0	0.0	
	9.100	188.00	963.70	6.38	0.0	0.0	975.36	0.46	0.53	0.46	975.49	0.50	10.40	
	9.100	188.00	963.70	6.38	0.0	0.0	971.97	-3.39	0.62	0.0	972.14	-2.65	0.0	
	9.100	188.00	963.70	6.38	0.0	0.0	973.77	1.80	0.50	0.0	973.87	-0.72	0.0	
	9.100	188.00	963.70	6.38	0.0	0.0	976.21	2.44	0.42	0.0	976.30	1.70	0.0	

SECNO	XLCH	ELMIN	X*CHSL	ELTRD	ELLC	CHSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
9.110	1.00	963.70	0.0	971.80	969.60	974.55	0.0	0.06	0.0	974.60	0.0	0.0
9.110	1.00	963.70	0.0	971.80	969.60	975.43	0.88	0.08	0.88	975.50	0.90	10.40
9.110	1.00	963.70	0.0	971.80	969.60	972.10	-3.34	0.13	0.0	972.16	-2.44	0.0
9.110	1.00	963.70	0.0	971.80	969.60	973.83	1.74	0.07	0.0	973.88	-0.72	0.0
9.110	1.00	963.70	0.0	971.80	969.60	976.25	2.41	0.04	0.0	976.30	1.70	0.0
9.120	12.00	963.70	0.0	971.80	969.60	974.60	0.0	0.04	0.0	974.64	0.0	0.0
9.120	12.00	963.70	0.0	971.80	969.60	975.48	0.88	0.05	0.88	975.55	0.90	10.40
9.120	12.00	963.70	0.0	971.80	969.60	972.19	-3.29	0.09	0.0	972.24	-2.40	0.0
9.120	12.00	963.70	0.0	971.80	969.60	973.89	1.70	0.05	0.0	973.95	-0.73	0.0
9.120	12.00	963.70	0.0	971.80	969.60	976.28	2.40	0.03	0.0	976.34	1.69	0.0
9.130	1.00	963.70	0.0	0.0	0.0	974.57	0.0	-0.03	0.0	974.66	0.0	0.0
9.130	1.00	963.70	0.0	0.0	0.0	975.44	0.87	-0.04	0.87	975.57	0.91	10.40
9.130	1.00	963.70	0.0	0.0	0.0	972.13	-3.31	-0.06	0.0	972.28	-2.38	0.0
9.130	1.00	963.70	0.0	0.0	0.0	973.85	1.72	-0.03	0.0	973.95	-0.71	0.0
9.130	1.00	963.70	0.0	0.0	0.0	976.26	2.41	-0.02	0.0	976.35	1.69	0.0
10.000	788.00	966.50	3.55	0.0	0.0	976.47	0.0	1.91	0.0	976.82	0.0	0.0
10.000	788.00	966.50	3.55	0.0	0.0	977.39	0.92	1.95	0.92	977.69	0.87	10.40
10.000	788.00	966.50	3.55	0.0	0.0	974.30	-3.09	2.17	0.0	974.54	-2.28	0.0
10.000	788.00	966.50	3.55	0.0	0.0	975.85	1.55	2.00	0.0	976.17	-0.45	0.0
10.000	788.00	966.50	3.55	0.0	0.0	977.99	2.14	1.73	0.0	978.38	1.56	0.0
10.100	1057.00	969.20	2.55	0.0	0.0	979.72	0.0	3.24	0.0	980.15	0.0	0.0
10.100	1057.00	969.20	2.55	0.0	0.0	980.34	0.62	2.94	0.62	980.80	0.65	9.10
10.100	1057.00	969.20	2.55	0.0	0.0	976.96	-3.38	2.65	0.0	977.23	-2.92	0.0
10.100	1057.00	969.20	2.55	0.0	0.0	978.99	2.03	3.14	0.0	979.36	-0.77	0.0
10.100	1057.00	969.20	2.55	0.0	0.0	981.35	2.36	3.36	0.0	981.83	1.73	0.0
10.110	1.00	969.20	0.0	978.90	977.70	979.73	0.0	3.01	0.0	980.17	0.0	0.0
10.110	1.00	969.20	0.0	978.90	977.70	980.35	0.62	3.01	0.62	980.92	0.75	9.10
10.110	1.00	969.20	0.0	978.90	977.70	976.96	-3.39	0.00	0.0	977.24	-2.94	0.0
10.110	1.00	969.20	0.0	978.90	977.70	979.00	2.04	3.01	0.0	979.48	-0.69	0.0
10.110	1.00	969.20	0.0	978.90	977.70	981.63	2.63	0.28	0.0	982.01	1.64	0.0
10.120	23.00	969.20	0.0	978.90	977.70	980.20	0.0	3.48	0.0	980.54	0.0	0.0
10.120	23.00	969.20	0.0	978.90	977.70	980.84	0.63	3.49	0.63	981.32	0.77	9.10
10.120	23.00	969.20	0.0	978.90	977.70	977.04	-3.80	0.06	0.0	977.31	-3.23	0.0
10.120	23.00	969.20	0.0	978.90	977.70	979.42	2.38	3.42	0.0	979.79	-0.35	0.0
10.120	23.00	969.20	0.0	978.90	977.70	981.96	2.54	0.33	0.0	982.29	1.75	0.0
10.130	1.00	969.20	0.0	0.0	0.0	980.20	0.0	-0.03	0.0	980.56	0.0	0.0
10.130	1.00	969.20	0.0	0.0	0.0	980.96	0.76	0.12	0.76	981.35	0.79	9.10
10.130	1.00	969.20	0.0	0.0	0.0	977.04	-3.91	0.00	0.0	977.31	-3.24	0.0
10.130	1.00	969.20	0.0	0.0	0.0	979.50	2.45	0.08	0.0	979.82	-0.74	0.0
10.130	1.00	969.20	0.0	0.0	0.0	981.91	2.41	-0.05	0.0	982.35	1.79	0.0
10.150	50.00	969.00	-3.99	0.0	0.0	980.23	0.0	0.04	0.0	981.03	0.0	0.0
10.150	50.00	969.00	-3.99	0.0	0.0	980.99	0.75	0.03	0.75	981.78	0.75	9.10
10.150	50.00	969.00	-3.99	0.0	0.0	977.15	-3.84	0.10	0.0	977.69	-3.35	0.0
10.150	50.00	969.00	-3.99	0.0	0.0	979.55	2.40	0.05	0.0	980.23	-0.80	0.0
10.150	50.00	969.00	-3.99	0.0	0.0	981.90	2.34	-0.01	0.0	982.95	1.92	0.0

SECNO	XLCH	ELMIN	X*CHSL	ELTRD	ELLC	CHSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E
10.200	1012.00	973.30	4.25	0.0	0.0	984.39	0.0	4.15	0.0	984.45	0.0	0.0
10.200	1012.00	973.30	4.25	0.0	0.0	984.73	0.34	3.74	0.34	985.16	0.31	10.40
10.200	1012.00	973.30	4.25	0.0	0.0	980.85	-3.87	3.71	0.0	981.10	-3.75	0.0
10.200	1012.00	973.30	4.25	0.0	0.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

	SECND	XLCH	ELMIN	KACHSL	ELTRD	ELLC	CHSEL	DIFWSP	DIFWSX	DIFKHS	EG	DIFEG	INPUT E	
	10.200	1012.00	973.30	4.25	0.0	0.0	984.39	0.0	4.15	0.0	984.85	0.0	0.0	
	10.200	1012.00	973.30	4.25	0.0	0.0	984.73	0.34	3.74	0.34	985.18	0.31	10.40	
	10.200	1012.00	973.30	4.25	0.0	0.0	980.85	-3.87	3.71	0.0	981.10	-3.76	0.0	
	10.200	1012.00	973.30	4.25	0.0	0.0	983.38	2.53	3.83	0.0	983.77	-1.08	0.0	
	10.200	1012.00	973.30	4.25	0.0	0.0	986.74	3.36	4.84	0.0	987.42	2.57	0.0	
	10.210	1.00	973.30	0.0	994.40	986.70	984.39	0.0	0.00	0.0	984.86	0.0	0.0	
	10.210	1.00	973.30	0.0	994.40	986.70	984.73	0.34	0.00	0.34	985.18	0.31	10.40	
	10.210	1.00	973.30	0.0	994.40	986.70	980.85	-3.87	0.00	0.0	981.10	-3.76	0.0	
	10.210	1.00	973.30	0.0	994.40	986.70	983.38	2.53	0.00	0.0	983.77	-1.08	0.0	
	10.210	1.00	973.30	0.0	994.40	986.70	986.74	3.35	0.00	0.0	987.43	2.57	0.0	
	10.220	10.00	973.30	0.0	994.40	986.70	984.42	0.0	0.03	0.0	984.88	0.0	0.0	
	10.220	10.00	973.30	0.0	994.40	986.70	984.75	0.33	0.03	0.33	985.19	0.31	10.40	
	10.220	10.00	973.30	0.0	994.40	986.70	980.83	-3.88	0.02	0.0	981.12	-3.76	0.0	
	10.220	10.00	973.30	0.0	994.40	986.70	983.41	2.53	0.03	0.0	983.80	-1.08	0.0	
	10.220	10.00	973.30	0.0	994.40	986.70	986.80	3.39	0.07	0.0	987.49	2.61	0.0	
	10.230	1.00	973.30	0.0	0.0	0.0	984.42	0.0	0.00	0.0	984.89	0.0	0.0	
	10.230	1.00	973.30	0.0	0.0	0.0	984.76	0.33	0.00	0.33	985.19	0.31	10.40	
	10.230	1.00	973.30	0.0	0.0	0.0	980.88	-3.88	0.00	0.0	981.12	-3.76	0.0	
	10.230	1.00	973.30	0.0	0.0	0.0	983.41	2.53	0.00	0.0	983.80	-1.08	0.0	
	10.230	1.00	973.30	0.0	0.0	0.0	986.82	3.41	0.02	0.0	987.50	2.61	0.0	
	10.250	50.00	973.60	6.00	0.0	0.0	984.62	0.0	0.20	0.0	985.01	0.0	0.0	
	10.250	50.00	973.60	6.00	0.0	0.0	984.87	0.25	0.11	0.25	985.33	0.31	10.40	
	10.250	50.00	973.60	6.00	0.0	0.0	980.97	-3.90	0.09	0.0	981.26	-3.75	0.0	
	10.250	50.00	973.60	6.00	0.0	0.0	983.56	2.59	0.15	0.0	983.92	-1.09	0.0	
	10.250	50.00	973.60	6.00	0.0	0.0	987.18	3.62	0.36	0.0	987.64	2.63	0.0	
K	11.000	859.00	976.50	3.38	0.0	0.0	984.72	0.0	2.15	0.0	987.07	0.0	0.0	K
	11.000	859.00	976.50	3.38	0.0	0.0	987.47	0.71	2.61	0.71	987.88	0.80	9.40	
	11.000	859.00	976.50	3.38	0.0	0.0	983.86	-3.61	2.90	0.0	984.22	-2.84	0.0	
	11.000	859.00	976.50	3.38	0.0	0.0	985.87	2.00	2.31	0.0	986.18	-0.88	0.0	
	11.000	859.00	976.50	3.38	0.0	0.0	989.08	3.21	1.90	0.0	989.34	2.28	0.0	
L	12.000	1000.00	978.90	2.40	0.0	0.0	988.81	0.0	2.04	0.0	986.33	0.0	0.0	L
	12.000	1000.00	978.90	2.40	0.0	0.0	989.74	0.93	2.27	0.93	989.87	0.94	7.40	
	12.000	1000.00	978.90	2.40	0.0	0.0	986.53	-3.21	2.67	0.0	986.65	-2.26	0.0	
	12.000	1000.00	978.90	2.40	0.0	0.0	988.10	1.57	2.26	0.0	988.22	-0.72	0.0	
	12.000	1000.00	978.90	2.40	0.0	0.0	990.70	2.61	1.63	0.0	990.82	1.69	0.0	
	12.100	961.00	980.00	1.14	0.0	0.0	990.50	0.0	1.64	0.0	991.33	0.0	0.0	
	12.100	961.00	980.00	1.14	0.0	0.0	991.33	0.82	1.59	0.82	992.02	0.70	10.40	
	12.100	961.00	980.00	1.14	0.0	0.0	988.23	-3.09	1.70	0.0	988.55	-2.76	0.0	
	12.100	961.00	980.00	1.14	0.0	0.0	989.84	1.61	1.74	0.0	990.47	-0.86	0.0	
	12.100	961.00	980.00	1.14	0.0	0.0	991.96	2.12	1.26	0.0	993.31	1.96	0.0	
	12.110	1.00	980.00	0.0	992.50	989.30	990.51	0.0	0.01	0.0	991.59	0.0	0.0	
	12.110	1.00	980.00	0.0	992.50	989.30	991.33	0.82	0.01	0.82	992.42	0.82	9.40	
	12.110	1.00	980.00	0.0	992.50	989.30	988.24	-3.10	0.00	0.0	988.55	-3.04	0.0	
	12.110	1.00	980.00	0.0	992.50	989.30	989.85	1.61	0.01	0.0	990.56	-1.03	0.0	
	12.110	1.00	980.00	0.0	992.50	989.30	991.98	2.13	0.01	0.0	994.28	2.69	0.0	

	SECND	XLCH	ELMIN	K*CHSL	ELTRD	ELLC	CWSEL	DIFWSP	DIFWSX	DIFKWS	EG	DIFEG	INPUT E	
	12.120	16.00	980.00	0.0	992.50	989.30	990.76	0.0	0.25	0.0	991.85	0.0	0.0	
	12.120	16.00	980.00	0.0	992.50	989.30	991.59	0.83	0.26	0.83	992.68	0.83	9.10	
	12.120	16.00	980.00	0.0	992.50	989.30	988.28	-3.31	0.05	0.0	988.59	-3.26	0.0	
	12.120	16.00	980.00	0.0	992.50	989.30	990.01	1.73	0.16	0.0	990.73	-1.12	0.0	
	12.120	16.00	980.00	0.0	992.50	989.30	993.99	3.98	2.01	0.0	994.84	2.99	0.0	
	12.130	1.00	980.00	0.0	0.0	0.0	991.17	0.0	0.41	0.0	991.89	0.0	0.0	
	12.130	1.00	980.00	0.0	0.0	0.0	992.13	0.96	0.54	0.96	992.73	0.84	10.40	
	12.130	1.00	980.00	0.0	0.0	0.0	988.29	-3.85	0.00	0.0	988.59	-3.30	0.0	
	12.130	1.00	980.00	0.0	0.0	0.0	990.16	1.87	0.15	0.0	990.75	-1.15	0.0	
	12.130	1.00	980.00	0.0	0.0	0.0	994.19	4.04	0.20	0.0	994.66	2.97	0.0	
	12.150	50.00	979.60	-8.01	0.0	0.0	991.35	0.0	0.18	0.0	992.47	0.0	0.0	
	12.150	50.00	979.60	-8.01	0.0	0.0	992.26	0.91	0.13	0.91	993.20	0.73	1.40	
	12.150	50.00	979.60	-8.01	0.0	0.0	988.39	-3.87	0.11	0.0	989.08	-3.39	0.0	
	12.150	50.00	979.60	-8.01	0.0	0.0	990.32	1.93	0.16	0.0	991.36	-1.11	0.0	
	12.150	50.00	979.60	-8.01	0.0	0.0	994.34	4.02	0.14	0.0	995.24	2.77	0.0	
M	13.000	806.00	983.80	5.21	0.0	0.0	994.90	0.0	3.54	0.0	995.17	0.0	0.0	M
	13.000	806.00	983.80	5.21	0.0	0.0	995.58	0.69	3.52	0.69	995.95	0.78	10.40	
	13.000	806.00	983.80	5.21	0.0	0.0	991.71	-3.87	3.52	0.0	991.93	-3.24	0.0	
	13.000	806.00	983.80	5.21	0.0	0.0	993.92	2.21	3.61	0.0	994.17	-1.00	0.0	
	13.000	806.00	983.80	5.21	0.0	0.0	997.13	3.21	2.79	0.0	997.44	2.27	0.0	
N	14.000	895.00	985.70	2.12	0.0	0.0	996.70	0.0	1.80	0.0	996.93	0.0	0.0	N
	14.000	895.00	985.70	2.12	0.0	0.0	997.63	0.93	2.05	0.93	997.78	1.05	10.40	
	14.000	895.00	985.70	2.12	0.0	0.0	993.87	-3.76	2.16	0.0	994.12	-2.84	0.0	
	14.000	895.00	985.70	2.12	0.0	0.0	995.80	1.93	1.88	0.0	996.05	-0.88	0.0	
	14.000	895.00	985.70	2.12	0.0	0.0	998.79	2.99	1.66	0.0	999.05	2.10	0.0	
O	15.000	690.00	986.60	1.30	0.0	0.0	998.01	0.0	1.31	0.0	998.24	0.0	0.0	O
	15.000	690.00	986.60	1.30	0.0	0.0	999.03	1.03	1.40	1.03	999.29	1.04	7.40	
	15.000	690.00	986.60	1.30	0.0	0.0	995.31	-3.72	1.44	0.0	995.46	-2.79	0.0	
	15.000	690.00	986.60	1.30	0.0	0.0	997.16	1.85	1.30	0.0	997.37	-0.87	0.0	
	15.000	690.00	986.60	1.30	0.0	0.0	999.98	2.82	1.20	0.0	1000.26	2.03	0.0	

APPENDIX C

Hydraulic Analysis Documentation
C-1 – HEC-RAS Existing Conditions Model Data
C-1 – HEC-RAS Proposed Conditions Model Data

C-1 HEC-RAS EXISTING CONDITIONS MODEL DATA

HoustonInjection.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    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Houston Injection
Project File : HoustonInjection.prj
Run Date and Time: 10/16/2015 11:08:16 AM

Project in English units

PLAN DATA

Plan Title: Plan 26
Plan File : s:\Marcellus_M-Z - Mark Sladic\Sunoco Logistics (SXL)\Houston Injection HEC-RAS_091415\HoustonInjection.p26

Geometry Title: Houston Injection X-Sections Existing R4
Geometry File : s:\Marcellus_M-Z - Mark Sladic\Sunoco Logistics (SXL)\Houston Injection HEC-RAS_091415\HoustonInjection.g09

Flow Title : 100yr Storm R4
Flow File : s:\Marcellus_M-Z - Mark Sladic\Sunoco Logistics (SXL)\Houston Injection HEC-RAS_091415\HoustonInjection.f04

Plan Summary Information:
Number of: Cross Sections = 25 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 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: 100yr Storm R4
Flow File : s:\Marcellus_M-Z - Mark Sladic\Sunoco Logistics (SXL)\Houston Injection HEC-RAS_091415\HoustonInjection.f04

Flow Data (cfs)

River	Reach	RS	100yr Storm
Chartiers Run	2	1300	1666.75
Chartiers Run	1	690	2950
Westland Run	3	700	1283.25

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Chartiers Run	2	100yr Storm	Normal S = 0.006588	
Chartiers Run	1	100yr Storm	Known WS = 996.7	
Westland Run	3	100yr Storm	Normal S = 0.001774	

GEOMETRY DATA

Geometry Title: Houston Injection X-Sections Existing R4
Geometry File : s:\Marcellus_M-Z - Mark Sladic\Sunoco Logistics (SXL)\Houston Injection HEC-RAS_091415\HoustonInjection.g09

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Chartiers Run	2		1
Chartiers Run	1	1	
Westland Run	3		1

JUNCTION INFORMATION

Name: 1
Description: Junction 1
Energy computation Method

Length across Junction			Tributary			
River	Reach		River	Reach	Length	Angle
Chartiers Run	2	to Chartiers Run	1		100	
Westland Run	3	to Chartiers Run	1		170	

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 1300

```
INPUT
Description: 13+00
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    1022   11.07    1020   20.94    1018   31.74    1016   49.99    1014
   61.77    1012   97.91    1010  114.36    1008  125.87    1006   150.8    1004
  164.76  1003.7  209.44    1002  220.48    1000  241.86  999.64   248.2   994.3
  248.83  994.03  257.48  992.72  266.49  994.07  269.08  994.26  273.78 1002.86
   310.1    1004  365.51    1004  382.39    1004  468.73    1006  483.56    1008
  492.69    1010  501.23    1012  505.96    1014   510.6    1016  516.34    1018
  522.21    1020

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  241.86    .045  273.78      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        241.86  273.78              100     100     100             .1       .3

CROSS SECTION


RIVER: Chartiers Run
REACH: 2                  RS: 1200

INPUT
Description: 12+00
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    1022    6.34    1020   12.32    1018   18.56    1016   24.82    1014
   34.91    1012   47.96    1010   74.92    1008  114.68    1006  133.11    1004
  179.65    1002  263.05     999  325.95     995  328.64  994.32  330.02  993.89
  335.85  993.28  342.23  993.95  344.59  994.23  347.57  995.41  526.28    1008
  539.84    1010  550.59    1012   559.5    1014  568.23    1016  576.34    1018
  583.58    1020

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035  325.95    .045  347.57      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        325.95  347.57              100     100     100             .1       .3

CROSS SECTION


RIVER: Chartiers Run
REACH: 2                  RS: 1100

INPUT
Description: 11+00
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    1020    5.56    1018   11.69    1016   17.69    1014   23.49    1012
   32.37    1010      57    1008    90.4    1006  102.86    1004  141.39    1002
  252.85    1000   324.8   998.7  376.75     997   407.3  995.87  410.28  993.33
  410.45  993.34  424.95  990.76  435.44  993.29  436.12  993.53  441.29  999.99
  481.01    1008  541.23    1010  557.62    1012  570.21    1014  577.45    1016
  584.32    1018  591.16    1020

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

0	.035	407.3	.045	441.29	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
407.3	441.29	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 1000

INPUT
Description: 10+00
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1018	4.56	1016	10.03	1014	16.12	1012	24.25	1010
68.33	1008	85.19	1006	104.4	1004	164.4	1002	258.05	1000
410.45	997.45	412.99	993.5	413.63	993.25	424.72	993.2	444.4	992.71
444.68	992.61	444.8	995.57	463.16	1002	488.84	1002	493.82	1004
502.09	1006	513.73	1008	523.1	1010	529.27	1012	538.81	1014

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	410.45	.045	444.8	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
410.45	444.8	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 900

INPUT
Description: 9+00
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1018	5.23	1016	10.73	1014	17.6	1012	32.87	1010
63.06	1009.01	98.76	1008	125.63	1006	219.27	1004	260.04	1002
318.57	1000	386.21	998	449.32	996.78	455.58	992.73	456.44	992.36
463.97	991.03	472.18	992.35	472.73	992.49	474	993.9	542.58	997
561.7	1000	566.33	1002	570.19	1004	574.97	1006	581.02	1008
587.22	1010	593.8	1012	600.84	1014				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	449.32	.045	474	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
449.32	474	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 800

INPUT
Description: 8+00
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1020	19.45	1018	26.39	1016	31.97	1014	37.47	1012

48.15	1010	129.59	1008	168.44	1006	245.01	1004	291.83	1002
340.73	1000	426.05	998	496.92	996	504.12	996.79	508.56	992.47
509.61	991.92	517.95	990.97	526.71	991.92	530.58	992.42	532.68	993.34
540.9	994	578.32	996	584.86	998	589.05	1000	593.45	1002
599.36	1002.6	620.86	1004	632.98	1006	638.18	1008	640.47	1010
642.81	1012								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	504.12	.045	532.68	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
504.12	532.68	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 700

INPUT
Description: 7+00
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1018	8.32	1016	31.4	1014	48.64	1012	65.7	1010
115.56	1008	130.19	1006	214.37	1004	269.16	1002	304.44	1000.89
335.41	1000	456.48	998	518.32	998	542.34	998	547.32	994
567.4	993.59	569.75	991.78	570.79	991.23	583.23	990.34	594.92	991.58
595.26	991.83	595.92	994.75	611.69	1013	614.49	1014		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	567.4	.045	595.92	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
567.4	595.92	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 600

INPUT
Description: 6+00
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1018	8.28	1016	17.93	1014	24.97	1012	64.42	1010
109.73	1008	134.72	1006	209.95	1004	262.21	1002	285.57	1001.19
328.45	1000	414.43	997	594.77	993.07	596.71	992.38	596.94	991.44
604.59	990.85	612.65	991.44	613.49	991.63	614.48	992.64	644.96	1007
649.16	1010								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	594.77	.045	614.48	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
594.77	614.48	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 500

INPUT
Description: 5+00
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1018	7.61	1016	14.82	1014	28.12	1012	77.14	1010
105.48	1008	169.46	1006	204.58	1004	246.73	1002	265.12	1001.15
289.81	1000	393.16	998	556.64	994.5	574.81	993.73	577.67	991.19
578.9	990.88	585.96	989.8	592.87	991.16	593.94	991.28	594.81	992.76
619.22	1017	626.63	1020						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	574.81	.045	594.81	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
574.81	594.81	100	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 400

INPUT
Description: 4+00
4+00
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1020	8.4	1018	16.74	1016	30.8	1014	87.62	1012
94.14	1010	112.83	1008	180.85	1006	197.47	1004	214.14	1002
268.8	1000	352.86	998.14	390.23	997.06	521.56	996	536.02	994.67
539.35	991.14	540.71	990.65	547.75	990.57	554.17	990.7	559.04	991.62
561.11	995.02	577.68	1007	599.84	1010	605.13	1012		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	536.02	.045	561.11	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
536.02	561.11	100	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 300

INPUT
Description: 3+00
3+00
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1016	13.91	1014	69.69	1012	108.77	1010	117.37	1008
151.47	1006	154.28	1005.17	170.01	1004	190.52	1002	215.39	1000
344.83	998	421.22	995.81	497.59	996	506.88	995.33	509.96	990.82
510.96	990.36	517.04	990.15	522.36	990.36	530.74	991.22	533.86	993.31
543.96	996	554.93	998	558.65	1000	561.82	1002	564.69	1004
567.54	1006	570.49	1008	574.04	1010	578.12	1012		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	506.88	.045	533.86	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
506.88	533.86	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 200

INPUT
Description: 2+00
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1016	34.24	1014	54.23	1012	88.6	1010	105.26	1008
110.95	1006	134.75	1004	155.42	1002.4	157.81	1002	183.48	1000
222.22	998	441.46	995.02	503.4	994	512.46	993.6	516.73	990.33
517.06	990.2	524.95	989.49	531.11	990.03	531.36	990.1	532.92	992.04
553.69	994	559.79	998	564.6	1000	568.47	1002	571.85	1004
575.03	1006	578.47	1008	581.57	1010				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	512.46	.045	532.92	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
512.46	532.92	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 100

INPUT
Description: 1+00
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1016	18.49	1014	33	1012	57.1	1010	95.37	1008
101.51	1006	105.78	1004	121.71	1002	153.3	1000	156.48	999.9
321.97	996.18	388.78	996	456.12	994.2	530.11	993.13	531.92	990.21
532.37	990.09	541.57	989.94	550.34	990.46	550.61	990.82	588.39	998
596.38	1000	599.1	1002	601.43	1004	603.89	1006	606.39	1008
609.02	1010								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	530.11	.045	550.61	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
530.11	550.61	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 000

INPUT
Description: 0+00
0+00

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1016	38.1	1014	49.42	1012	58.9	1010	78.48	1008
110.64	1006	116.83	1004	123.89	1002	144.04	1000	168.76	998
171.2	997.18	272.4	996	316.29	995.75	405.94	993.92	582.13	994
593.22	990.81	594.99	990.31	595.58	990.32	604.62	989.88	612.46	990.26
613.01	990.33	615.31	990.86	648.51	996	655.74	998	666.41	1000
688.85	1002	697.85	1004	702.06	1006	705.65	1008	708.85	1010
711.9	1012								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	593.22	.045	615.31	.1

Bank Sta: Left	Right	Coeff Contr.	Expan.
593.22	615.31	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 1 RS: 690

INPUT
Description: O
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3.83	1008.45	7.56	1006.45	12.24	1004.45	47.44	1002.45
51.87	1000.45	58.45	998.45	72.21	996.45	109.85	994.45	128.4	992.45
147.98	990.45	159.7	990.45	161.79	992.45	175.45	992.45	179.32	992.09
180.95	988.98	181.24	988.97	190.12	989.1	200.05	989.75	205.48	991.62
206.48	992.45	210.98	994.45	215.83	996.45	225.48	998.45	235.58	1000.45
249.66	1002.45	327.39	1003.59	419.76	1004.45	422.29	1006.45	424.19	1008.45
425.67	1010.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	179.32	.045	205.48	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
179.32	205.48	690	690	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 1 RS: 000

INPUT
Description: N
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1715	1006.3	1725	1000.4	1773	1000.4	1782	1001.8	1793	1001.8
1808	1001.4	1832	999.9	1850	993.4	1866	993.3	1901	992.3
1970	990.6	1987	986.7	1997	986.2	2000	985.9	2005	985.7
2006	986.2	2013	990.8	2038	990.3	2084	991.9	2098	998.9
2145	999.3	2222	1007						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1715	.1	1970	.045	2013	.1

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

1970 2013 100 100 100 .1 .3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 700

INPUT
Description: 7+00
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	19.55	1008.45	32.84	1006.45	45.16	1004.45	60.48	1002.45
83.63	1000.45	105	998.45	199.77	996.45	215.09	995.25	216.25	993.4
216.84	992.88	221.96	992.52	226.8	992.87	234.82	992.86	239.2	996.42
241.34	996.45	244.65	998.45	271.7	998.45	295.52	998.45	303.77	1000.45
335.24	1001.1	401.57	1002.45	429.04	1004.45	434.97	1006.45	437.76	1008.45
440.58	1010.45	443.43	1012.45	445.83	1014.45	448.43	1016.45	451.05	1018.45
453.67	1020.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	215.09	.045	239.2	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
215.09	239.2	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 600

INPUT
Description: 6+00
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	2.65	1008.45	5.6	1006.45	9.02	1004.45	12.9	1002.45
17.22	1000.45	24.53	998.45	98.22	996.45	102.18	994.45	108.86	995.33
111.12	992.92	112.83	992.29	116.79	991.61	120.05	992.21	122.46	992.44
126.95	992.92	134.4	994.45	151.84	996.45	161.39	998.45	188.75	998.45
232.09	996.45	239.86	996.45	252.57	998.45	260.19	1000.45	329.76	1002.45
366.35	1004.45	376.68	1006.45	386.51	1008.45	392.81	1010.45	396.78	1012.45
400.8	1014.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	108.86	.045	126.95	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
108.86	126.95	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 500

INPUT
Description: 5+00
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3.08	1008.45	6.16	1006.45	9.23	1004.45	12.31	1002.45

```
   15.44 1000.45   19.05  998.45  122.08   996.6  130.35  996.45  144.22  994.45
  145.87  994.28  146.95  992.58  148.02  992.28  157.18   991.6  166.49  992.18
  166.94  992.63  167.24  992.91  172.62  994.45  178.98  996.45  184.49  998.45
  194.71 1000.45  356.68 1002.45  369.21 1004.45  379.49 1008.45   382.9 1010.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  145.87    .045  167.24      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        145.87  167.24              100     100     100             .1       .3

CROSS SECTION


RIVER: Westland Run
REACH: 3                  RS: 400

INPUT
Description: 4+00
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 1010.45    3.11 1008.45    6.28 1006.45    9.45 1004.45   12.61 1002.45
   15.72 1000.45   19.21  998.45   36.98  996.45   41.65  996.45   99.21  996.45
   153.1  993.51  154.68   991.6  154.95  991.35  162.85  990.47  169.62  991.31
   171.8  991.69  173.25  994.78  184.83  996.45  193.92  998.45  207.07 1000.45
  236.59 1002.45  250.86 1002.45  282.12 1002.45  288.86 1004.45  309.36 1006.45
  317.96 1008.45  327.35 1010.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   153.1    .045  173.25      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         153.1  173.25              100     100     100             .1       .3

CROSS SECTION


RIVER: Westland Run
REACH: 3                  RS: 300

INPUT
Description: 3+00
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 1010.45       3 1008.45    6.97 1006.45   12.45 1004.45   17.34 1002.45
    21.7 1000.45   25.86  998.45   81.48  996.45  131.06  996.45  171.03  996.45
  181.63  994.45  186.94  993.61  188.03   991.3  188.87  991.47  196.07  990.85
  202.62  991.23  203.61   991.2  205.07   994.1   216.1  996.45     231  998.23
  233.34  998.45  318.93 1000.37  321.99 1000.45  334.41 1002.45  349.12 1004.45
  360.12 1006.45  371.36 1008.45  382.06 1010.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  186.94    .045  205.07      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        186.94  205.07               25      25      25             .1       .3

BRIDGE
```

RIVER: Westland Run
REACH: 3 RS: 292

INPUT
Description:
Distance from Upstream XS = 8
Deck/Roadway Width = 16
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 28

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	998.416	996.249	3	998.416	996.249	6.97	998.416	996.249
12.45	998.416	996.249	17.34	998.416	996.249	21.7	998.416	996.249
25.86	998.416	996.249	81.48	998.416	996.249	131.06	998.416	996.249
171.03	998.416	996.249	181.63	998.416	996.249	186.94	998.416	996.249
188.03	998.416	996.249	188.87	998.416	996.249	196.07	998.416	996.249
202.62	998.416	996.249	203.61	998.416	996.249	205.07	998.416	996.249
216.1	998.416	996.249	231	998.416	996.249	233.34	998.416	996.249
318.93	998.416	996.249	321.99	998.416	996.249	334.41	998.416	996.249
349.12	998.416	996.249	360.12	998.416	996.249	371.36	998.416	996.249
382.06	998.416	996.249						

Upstream Bridge Cross Section Data
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3	1008.45	6.97	1006.45	12.45	1004.45	17.34	1002.45
21.7	1000.45	25.86	998.45	81.48	996.45	131.06	996.45	171.03	996.45
181.63	994.45	186.94	993.61	188.03	991.3	188.87	991.47	196.07	990.85
202.62	991.23	203.61	991.2	205.07	994.1	216.1	996.45	231	998.23
233.34	998.45	318.93	1000.37	321.99	1000.45	334.41	1002.45	349.12	1004.45
360.12	1006.45	371.36	1008.45	382.06	1010.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	186.94	.045	205.07	.1

Bank Sta: Left Right Coeff Contr. Expan.
186.94 205.07 .1 .3

Downstream Deck/Roadway Coordinates
num= 28

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	998.416	996.249	3	998.416	996.249	6.97	998.416	996.249
12.45	998.416	996.249	17.34	998.416	996.249	21.7	998.416	996.249
25.86	998.416	996.249	81.48	998.416	996.249	131.06	998.416	996.249
171.03	998.416	996.249	181.63	998.416	996.249	186.94	998.416	996.249
188.03	998.416	996.249	188.87	998.416	996.249	196.07	998.416	996.249
202.62	998.416	996.249	203.61	998.416	996.249	205.07	998.416	996.249
216.1	998.416	996.249	231	998.416	996.249	233.34	998.416	996.249
318.93	998.416	996.249	321.99	998.416	996.249	334.41	998.416	996.249
349.12	998.416	996.249	360.12	998.416	996.249	371.36	998.416	996.249
382.06	998.416	996.249						

Downstream Bridge Cross Section Data
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3	1008.45	6.97	1006.45	12.45	1004.45	17.34	1002.45
21.7	1000.45	25.86	998.45	81.48	996.45	131.06	996.45	171.03	996.45
181.63	994.45	186.94	993.61	188.03	991.3	188.87	991.47	196.07	990.85
202.62	991.23	203.61	991.2	205.07	994.1	216.1	996.45	231	998.23
233.34	998.45	318.93	1000.37	321.99	1000.45	334.41	1002.45	349.12	1004.45
360.12	1006.45	371.36	1008.45	382.06	1010.45				

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  186.94    .045  205.07      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        186.94  205.07             .1       .3

Upstream Embankment side slope              =    .212 horiz. to 1.0 vertical
Downstream Embankment side slope            =    .258 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Westland Run
REACH: 3                  RS: 275

INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 1010.45       3 1008.45    6.97 1006.45   12.45 1004.45   17.34 1002.45
    21.7 1000.45   25.86  998.45   81.48  996.45  131.06  996.45  171.03  996.45
  181.63  994.45  186.94  993.61  188.03   991.3  188.87  991.47  196.07  990.85
  202.62  991.23  203.61   991.2  205.07   994.1   216.1  996.45     231  998.23
  233.34  998.45  318.93 1000.37  321.99 1000.45  334.41 1002.45  349.12 1004.45
  360.12 1006.45  371.36 1008.45  382.06 1010.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  186.94    .045  205.07      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        186.94  205.07               75      75       75             .1       .3

CROSS SECTION


RIVER: Westland Run
REACH: 3                  RS: 200

INPUT
Description: 2+00
```

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3.65	1008.45	6.15	1006.45	8.35	1004.45	10.72	1002.45
14.43	1000.45	18.13	998.45	86.3	996.45	114.76	994.45	156.3	994.45
184.6	994.34	188.13	990.61	189.66	990.12	196.34	989.62	202.93	990.18
204.23	990.52	207.82	994.73	213.02	994.45	269.55	996.45	318.58	998.45
393.56	1000.45	424.45	1002.45	433.17	1004.45	446.7	1006.45	459.07	1008.45
467.71	1010.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	184.6	.045	207.82	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
184.6	207.82	100	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 100

INPUT
Description: 1+00
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3.34	1008.45	6.55	1006.45	9.27	1004.45	11.61	1002.45
15.5	1000.45	18.5	998.45	67.97	996.45	81.85	994.45	100.64	992.06
104.5	990.01	105.55	989.65	114.96	989.16	121.1	989.65	124.43	990.35
130.94	997.21	161.66	994.45	169.6	994.48	189.96	994.45	221.79	994
295.39	994.96	395.01	996.45	437.81	998.45	460.09	1000.45	463.45	1000.45
473.66	1000.45	494.19	1002.45	520.57	1004.45	527.43	1006.45	534.56	1008.45
543.23	1010.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	100.64	.045	130.94	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100.64	130.94	100	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 000

INPUT
Description: 0+00
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	2.62	1008.45	5.23	1006.45	7.84	1004.45	10.47	1002.45
13.09	1000.45	30.96	998.45	67.11	996.45	89.34	994.45	106.61	992.51
110.75	989.74	110.96	989.64	126.33	988.87	134.71	989.63	136.89	992.53
186.09	994.45	193.64	994.47	247.36	994.45	320	994.45	354.52	994.45
374.47	994.6	379.63	994.91	466.64	996.45	500.95	996.69	517.8	998.45
551.34	1000.45	557.73	1001.22	568.93	1002.45	583.64	1004.45	597.42	1006.45
616.28	1008.45	622.68	1010.45	630.2	1012.45	645.48	1013.88		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	106.61	.045	136.89	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
106.61	136.89	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Chartiers Run

Reach	River Sta.	n1	n2	n3
2	1300	.1	.045	.1
2	1200	.035	.045	.1
2	1100	.035	.045	.1
2	1000	.035	.045	.1
2	900	.035	.045	.1
2	800	.035	.045	.1
2	700	.035	.045	.1
2	600	.035	.045	.1
2	500	.035	.045	.1
2	400	.035	.045	.1
2	300	.035	.045	.1
2	200	.035	.045	.1
2	100	.035	.045	.1
2	000	.035	.045	.1
1	690	.1	.045	.1
1	000	.1	.045	.1

River:Westland Run

Reach	River Sta.	n1	n2	n3
3	700	.1	.045	.1
3	600	.1	.045	.1
3	500	.1	.045	.1
3	400	.1	.045	.1
3	300	.1	.045	.1
3	292	Bridge		
3	275	.1	.045	.1
3	200	.1	.045	.035
3	100	.1	.045	.035
3	000	.1	.045	.035

SUMMARY OF REACH LENGTHS

River: Chartiers Run

Reach	River Sta.	Left	Channel	Right
2	1300	100	100	100
2	1200	100	100	100
2	1100	100	100	100
2	1000	100	100	100
2	900	100	100	100
2	800	100	100	100
2	700	100	100	100
2	600	100	100	100
2	500	100	100	100
2	400	100	100	100

2	300	100	100	100
2	200	100	100	100
2	100	100	100	100
2	000			
1	690	690	690	690
1	000	100	100	100

River: Westland Run

Reach	River Sta.	Left	Channel	Right
3	700	100	100	100
3	600	100	100	100
3	500	100	100	100
3	400	100	100	100
3	300	25	25	25
3	292	Bridge		
3	275	75	75	75
3	200	100	100	100
3	100	100	100	100
3	000			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Chartiers Run

Reach	River Sta.	Contr.	Expan.
2	1300	.1	.3
2	1200	.1	.3
2	1100	.1	.3
2	1000	.1	.3
2	900	.1	.3
2	800	.1	.3
2	700	.1	.3
2	600	.1	.3
2	500	.1	.3
2	400	.1	.3
2	300	.1	.3
2	200	.1	.3
2	100	.1	.3
2	000	.1	.3
1	690	.1	.3
1	000	.1	.3

River: Westland Run

Reach	River Sta.	Contr.	Expan.
3	700	.1	.3
3	600	.1	.3
3	500	.1	.3
3	400	.1	.3
3	300	.1	.3
3	292	Bridge	
3	275	.1	.3
3	200	.1	.3
3	100	.1	.3

```
3                    000             .1        .3
```

Plan: 101015Model Chartiers Run 2 RS: 1300 Profile: 100yr Storm

E.G. Elev (ft)	1001.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.05	Wt. n-Val.		0.045	
W.S. Elev (ft)	999.37	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	999.06	Flow Area (sq ft)		144.99	
E.G. Slope (ft/ft)	0.018112	Area (sq ft)		144.99	
Q Total (cfs)	1666.75	Flow (cfs)		1666.75	
Top Width (ft)	29.70	Top Width (ft)		29.70	
Vel Total (ft/s)	11.50	Avg. Vel. (ft/s)		11.50	
Max Chl Dpth (ft)	6.65	Hydr. Depth (ft)		4.88	
Conv. Total (cfs)	12384.6	Conv. (cfs)		12384.6	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		34.85	
Min Ch El (ft)	992.72	Shear (lb/sq ft)		4.70	
Alpha	1.00	Stream Power (lb/ft s)	522.21	0.00	0.00
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	14.03	5.78	2.87
C & E Loss (ft)	0.53	Cum SA (acres)	5.46	0.76	0.81

Plan: 101015Model Chartiers Run 2 RS: 1200 Profile: 100yr Storm

E.G. Elev (ft)	1000.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	1000.09	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	210.87	131.96	155.44
E.G. Slope (ft/ft)	0.002428	Area (sq ft)	210.87	131.96	155.44
Q Total (cfs)	1666.75	Flow (cfs)	759.40	707.10	200.25
Top Width (ft)	181.25	Top Width (ft)	93.20	21.62	66.43
Vel Total (ft/s)	3.35	Avg. Vel. (ft/s)	3.60	5.36	1.29
Max Chl Dpth (ft)	6.81	Hydr. Depth (ft)	2.26	6.10	2.34
Conv. Total (cfs)	33828.2	Conv. (cfs)	15412.6	14351.2	4064.3
Length Wtd. (ft)	100.00	Wetted Per. (ft)	93.35	22.08	66.59
Min Ch El (ft)	993.28	Shear (lb/sq ft)	0.34	0.91	0.35
Alpha	1.63	Stream Power (lb/ft s)	583.58	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	13.78	5.46	2.69
C & E Loss (ft)	0.02	Cum SA (acres)	5.35	0.70	0.73

Plan: 101015Model Chartiers Run 2 RS: 1100 Profile: 100yr Storm

E.G. Elev (ft)	1000.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.035	0.045	
W.S. Elev (ft)	999.94	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	257.64	235.22	
E.G. Slope (ft/ft)	0.001608	Area (sq ft)	257.64	235.22	
Q Total (cfs)	1666.75	Flow (cfs)	626.35	1040.40	
Top Width (ft)	184.87	Top Width (ft)	150.92	33.95	
Vel Total (ft/s)	3.38	Avg. Vel. (ft/s)	2.43	4.42	
Max Chl Dpth (ft)	9.18	Hydr. Depth (ft)	1.71	6.93	
Conv. Total (cfs)	41564.2	Conv. (cfs)	15619.5	25944.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)	150.98	38.53	
Min Ch El (ft)	990.76	Shear (lb/sq ft)	0.17	0.61	
Alpha	1.26	Stream Power (lb/ft s)	591.16	0.00	0.00
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	13.25	5.04	2.51
C & E Loss (ft)	0.03	Cum SA (acres)	5.07	0.64	0.65

Plan: 101015Model Chartiers Run 2 RS: 1000 Profile: 100yr Storm

E.G. Elev (ft)	999.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.56	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	999.33	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	105.14	209.12	20.14
E.G. Slope (ft/ft)	0.004200	Area (sq ft)	105.14	209.12	20.14
Q Total (cfs)	1666.75	Flow (cfs)	277.16	1361.19	28.40
Top Width (ft)	157.18	Top Width (ft)	112.11	34.35	10.72
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)	2.64	6.51	1.41
Max Chl Dpth (ft)	6.72	Hydr. Depth (ft)	0.94	6.09	1.88
Conv. Total (cfs)	25718.9	Conv. (cfs)	4276.7	21003.9	438.3
Length Wtd. (ft)	100.00	Wetted Per. (ft)	112.12	39.42	11.36
Min Ch El (ft)	992.61	Shear (lb/sq ft)	0.25	1.39	0.46
Alpha	1.44	Stream Power (lb/ft s)	538.81	0.00	0.00
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	12.83	4.53	2.49
C & E Loss (ft)	0.09	Cum SA (acres)	4.77	0.56	0.64

Plan: 101015Model Chartiers Run 2 RS: 900 Profile: 100yr Storm

E.G. Elev (ft)	999.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	999.22	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	140.90	163.62	274.44
E.G. Slope (ft/ft)	0.002349	Area (sq ft)	140.90	163.62	274.44
Q Total (cfs)	1666.75	Flow (cfs)	353.85	874.23	438.67
Top Width (ft)	211.87	Top Width (ft)	104.45	24.68	82.74
Vel Total (ft/s)	2.88	Avg. Vel. (ft/s)	2.51	5.34	1.60
Max Chl Dpth (ft)	8.19	Hydr. Depth (ft)	1.35	6.63	3.32
Conv. Total (cfs)	34393.2	Conv. (cfs)	7301.7	18039.7	9051.8
Length Wtd. (ft)	100.00	Wetted Per. (ft)	104.48	26.82	82.99
Min Ch El (ft)	991.03	Shear (lb/sq ft)	0.20	0.89	0.48
Alpha	2.05	Stream Power (lb/ft s)	600.84	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	12.55	4.10	2.15
C & E Loss (ft)	0.02	Cum SA (acres)	4.52	0.49	0.53

Plan: 101015Model Chartiers Run 2 RS: 800 Profile: 100yr Storm

E.G. Elev (ft)	999.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	999.06	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	189.28	196.77	210.94
E.G. Slope (ft/ft)	0.001673	Area (sq ft)	189.28	196.77	210.94
Q Total (cfs)	1666.75	Flow (cfs)	437.17	915.50	314.08
Top Width (ft)	206.30	Top Width (ft)	123.34	28.56	54.40
Vel Total (ft/s)	2.79	Avg. Vel. (ft/s)	2.31	4.65	1.49
Max Chl Dpth (ft)	8.09	Hydr. Depth (ft)	1.53	6.89	3.88
Conv. Total (cfs)	40744.6	Conv. (cfs)	10686.9	22379.9	7677.8
Length Wtd. (ft)	100.00	Wetted Per. (ft)	123.42	30.78	55.02
Min Ch El (ft)	990.97	Shear (lb/sq ft)	0.16	0.67	0.40
Alpha	1.76	Stream Power (lb/ft s)	642.81	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	12.17	3.69	1.59
C & E Loss (ft)	0.02	Cum SA (acres)	4.26	0.43	0.38

Plan: 101015Model Chartiers Run 2 RS: 700 Profile: 100yr Storm

E.G. Elev (ft)	999.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.64	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	178.24	214.89	6.55
E.G. Slope (ft/ft)	0.002414	Area (sq ft)	178.24	214.89	6.55
Q Total (cfs)	1666.75	Flow (cfs)	414.76	1246.38	5.61
Top Width (ft)	181.73	Top Width (ft)	149.85	28.52	3.36
Vel Total (ft/s)	4.17	Avg. Vel. (ft/s)	2.33	5.80	0.86
Max Chl Dpth (ft)	8.30	Hydr. Depth (ft)	1.19	7.53	1.95
Conv. Total (cfs)	33925.6	Conv. (cfs)	8442.1	25369.2	114.3
Length Wtd. (ft)	100.00	Wetted Per. (ft)	151.27	31.79	5.15
Min Ch El (ft)	990.34	Shear (lb/sq ft)	0.18	1.02	0.19
Alpha	1.52	Stream Power (lb/ft s)	614.49	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	11.75	3.22	1.34
C & E Loss (ft)	0.11	Cum SA (acres)	3.95	0.36	0.31

Plan: 101015Model Chartiers Run 2 RS: 600 Profile: 100yr Storm

E.G. Elev (ft)	998.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.81	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	728.35	146.58	40.44
E.G. Slope (ft/ft)	0.000384	Area (sq ft)	728.35	146.58	40.44
Q Total (cfs)	1666.75	Flow (cfs)	1297.66	345.75	23.34
Top Width (ft)	265.10	Top Width (ft)	232.29	19.71	13.10
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)	1.78	2.36	0.58
Max Chl Dpth (ft)	7.96	Hydr. Depth (ft)	3.14	7.44	3.09
Conv. Total (cfs)	85066.7	Conv. (cfs)	66229.0	17646.3	1191.4
Length Wtd. (ft)	100.00	Wetted Per. (ft)	232.37	21.06	14.48
Min Ch El (ft)	990.85	Shear (lb/sq ft)	0.08	0.17	0.07
Alpha	1.09	Stream Power (lb/ft s)	649.16	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	10.71	2.80	1.29
C & E Loss (ft)	0.01	Cum SA (acres)	3.51	0.31	0.29

Plan: 101015Model Chartiers Run 2 RS: 500 Profile: 100yr Storm

E.G. Elev (ft)	998.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.69	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	493.79	156.66	17.69
E.G. Slope (ft/ft)	0.000893	Area (sq ft)	493.79	156.66	17.69
Q Total (cfs)	1666.75	Flow (cfs)	1082.94	570.91	12.89
Top Width (ft)	243.15	Top Width (ft)	217.18	20.00	5.97
Vel Total (ft/s)	2.49	Avg. Vel. (ft/s)	2.19	3.64	0.73
Max Chl Dpth (ft)	8.89	Hydr. Depth (ft)	2.27	7.83	2.96
Conv. Total (cfs)	55778.8	Conv. (cfs)	36241.4	19105.9	431.5
Length Wtd. (ft)	100.00	Wetted Per. (ft)	217.24	22.07	8.41
Min Ch El (ft)	989.80	Shear (lb/sq ft)	0.13	0.40	0.12
Alpha	1.23	Stream Power (lb/ft s)	626.63	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	9.30	2.45	1.22
C & E Loss (ft)	0.01	Cum SA (acres)	2.99	0.26	0.27

Plan: 101015Model Chartiers Run 2 RS: 400 Profile: 100yr Storm

E.G. Elev (ft)	998.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.46	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	333.97	180.59	8.20
E.G. Slope (ft/ft)	0.001687	Area (sq ft)	333.97	180.59	8.20
Q Total (cfs)	1666.75	Flow (cfs)	825.56	834.93	6.25
Top Width (ft)	227.67	Top Width (ft)	197.82	25.09	4.76
Vel Total (ft/s)	3.19	Avg. Vel. (ft/s)	2.47	4.62	0.76
Max Chl Dpth (ft)	7.89	Hydr. Depth (ft)	1.69	7.20	1.72
Conv. Total (cfs)	40574.6	Conv. (cfs)	20097.1	20325.3	152.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	197.90	28.70	5.88
Min Ch El (ft)	990.57	Shear (lb/sq ft)	0.18	0.66	0.15
Alpha	1.35	Stream Power (lb/ft s)	605.13	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	8.35	2.07	1.19
C & E Loss (ft)	0.01	Cum SA (acres)	2.52	0.21	0.26

Plan: 101015Model Chartiers Run 2 RS: 300 Profile: 100yr Storm

E.G. Elev (ft)	998.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.32	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	321.22	197.92	51.68
E.G. Slope (ft/ft)	0.001429	Area (sq ft)	321.22	197.92	51.68
Q Total (cfs)	1666.75	Flow (cfs)	749.84	866.06	50.84
Top Width (ft)	231.67	Top Width (ft)	183.01	26.98	21.67
Vel Total (ft/s)	2.92	Avg. Vel. (ft/s)	2.33	4.38	0.98
Max Chl Dpth (ft)	8.17	Hydr. Depth (ft)	1.76	7.34	2.38
Conv. Total (cfs)	44097.9	Conv. (cfs)	19838.9	22913.8	1345.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	183.07	30.15	22.29
Min Ch El (ft)	990.15	Shear (lb/sq ft)	0.16	0.59	0.21
Alpha	1.46	Stream Power (lb/ft s)	578.12	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	7.60	1.63	1.12
C & E Loss (ft)	0.04	Cum SA (acres)	2.08	0.15	0.23

Plan: 101015Model Chartiers Run 2 RS: 200 Profile: 100yr Storm

E.G. Elev (ft)	998.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.34	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	680.35	163.15	124.88
E.G. Slope (ft/ft)	0.000491	Area (sq ft)	680.35	163.15	124.88
Q Total (cfs)	1666.75	Flow (cfs)	1112.17	445.89	108.69
Top Width (ft)	344.95	Top Width (ft)	296.80	20.46	27.69
Vel Total (ft/s)	1.72	Avg. Vel. (ft/s)	1.63	2.73	0.87
Max Chl Dpth (ft)	8.85	Hydr. Depth (ft)	2.29	7.97	4.51
Conv. Total (cfs)	75247.7	Conv. (cfs)	50210.3	20130.5	4907.0
Length Wtd. (ft)	100.00	Wetted Per. (ft)	296.85	22.59	29.04
Min Ch El (ft)	989.49	Shear (lb/sq ft)	0.07	0.22	0.13
Alpha	1.29	Stream Power (lb/ft s)	581.57	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	6.45	1.22	0.92
C & E Loss (ft)	0.01	Cum SA (acres)	1.53	0.10	0.17

Plan: 101015Model Chartiers Run 2 RS: 100 Profile: 100yr Storm

E.G. Elev (ft)	998.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.31	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	809.37	165.22	147.57
E.G. Slope (ft/ft)	0.000327	Area (sq ft)	809.37	165.22	147.57
Q Total (cfs)	1666.75	Flow (cfs)	1196.90	374.71	95.14
Top Width (ft)	362.46	Top Width (ft)	302.94	20.50	39.02
Vel Total (ft/s)	1.49	Avg. Vel. (ft/s)	1.48	2.27	0.64
Max Chl Dpth (ft)	8.37	Hydr. Depth (ft)	2.67	8.06	3.78
Conv. Total (cfs)	92122.4	Conv. (cfs)	66153.2	20710.6	5258.6
Length Wtd. (ft)	100.00	Wetted Per. (ft)	303.00	22.34	39.74
Min Ch El (ft)	989.94	Shear (lb/sq ft)	0.05	0.15	0.08
Alpha	1.25	Stream Power (lb/ft s)	609.02	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	4.74	0.84	0.61
C & E Loss (ft)	0.01	Cum SA (acres)	0.84	0.05	0.09

Plan: 101015Model Chartiers Run 2 RS: 000 Profile: 100yr Storm

E.G. Elev (ft)	998.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.31	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	1428.12	179.48	171.88
E.G. Slope (ft/ft)	0.000101	Area (sq ft)	1428.12	179.48	171.88
Q Total (cfs)	1666.75	Flow (cfs)	1361.62	240.14	65.00
Top Width (ft)	492.52	Top Width (ft)	428.33	22.09	42.10
Vel Total (ft/s)	0.94	Avg. Vel. (ft/s)	0.95	1.34	0.38
Max Chl Dpth (ft)	8.43	Hydr. Depth (ft)	3.33	8.12	4.08
Conv. Total (cfs)	165479.0	Conv. (cfs)	135184.8	23841.3	6453.0
Length Wtd. (ft)	100.00	Wetted Per. (ft)	428.95	22.24	42.80
Min Ch El (ft)	989.88	Shear (lb/sq ft)	0.02	0.05	0.03
Alpha	1.15	Stream Power (lb/ft s)	711.90	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	2.17	0.44	0.24
C & E Loss (ft)	0.06	Cum SA (acres)			

Plan: 101015Model Chartiers Run 1 RS: 690 Profile: 100yr Storm

E.G. Elev (ft)	998.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	997.55	Reach Len. (ft)	690.00	690.00	690.00
Crit W.S. (ft)		Flow Area (sq ft)	464.76	207.49	37.07
E.G. Slope (ft/ft)	0.004459	Area (sq ft)	464.76	207.49	37.07
Q Total (cfs)	2950.00	Flow (cfs)	1164.34	1723.54	62.12
Top Width (ft)	156.50	Top Width (ft)	114.68	26.16	15.66
Vel Total (ft/s)	4.16	Avg. Vel. (ft/s)	2.51	8.31	1.68
Max Chl Dpth (ft)	8.58	Hydr. Depth (ft)	4.05	7.93	2.37
Conv. Total (cfs)	44179.3	Conv. (cfs)	17437.3	25811.8	930.2
Length Wtd. (ft)	690.00	Wetted Per. (ft)	115.84	28.38	16.89
Min Ch El (ft)	988.97	Shear (lb/sq ft)	1.12	2.04	0.61
Alpha	2.48	Stream Power (lb/ft s)	425.67	0.00	0.00
Frctn Loss (ft)	1.20	Cum Volume (acre-ft)	8.18	4.76	3.73
C & E Loss (ft)	0.15	Cum SA (acres)	1.93	0.55	0.76

Plan: 101015Model Chartiers Run 1 RS: 000 Profile: 100yr Storm

E.G. Elev (ft)	996.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	996.70	Reach Len. (ft)			
Crit W.S. (ft)	992.88	Flow Area (sq ft)	567.43	393.95	434.39
E.G. Slope (ft/ft)	0.000916	Area (sq ft)	567.43	393.95	434.39
Q Total (cfs)	2950.00	Flow (cfs)	682.34	1672.94	594.71
Top Width (ft)	252.74	Top Width (ft)	129.14	43.00	80.60
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)	1.20	4.25	1.37
Max Chl Dpth (ft)	11.00	Hydr. Depth (ft)	4.39	9.16	5.39
Conv. Total (cfs)	97482.9	Conv. (cfs)	22548.1	55282.5	19652.3
Length Wtd. (ft)		Wetted Per. (ft)	129.75	44.97	81.77
Min Ch El (ft)	985.70	Shear (lb/sq ft)	0.25	0.50	0.30
Alpha	2.45	Stream Power (lb/ft s)	2222.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Plan: 101015Model Westland Run 3 RS: 700 Profile: 100yr Storm

E.G. Elev (ft)	1000.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.53	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	386.70	176.84	133.83
E.G. Slope (ft/ft)	0.001310	Area (sq ft)	386.70	176.84	133.83
Q Total (cfs)	1283.25	Flow (cfs)	424.64	746.92	111.69
Top Width (ft)	224.94	Top Width (ft)	132.39	24.11	68.44
Vel Total (ft/s)	1.84	Avg. Vel. (ft/s)	1.10	4.22	0.83
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)	2.92	7.33	1.96
Conv. Total (cfs)	35453.0	Conv. (cfs)	11731.8	20635.5	3085.7
Length Wtd. (ft)	100.00	Wetted Per. (ft)	132.55	26.62	69.24
Min Ch El (ft)	992.52	Shear (lb/sq ft)	0.24	0.54	0.16
Alpha	3.20	Stream Power (lb/ft s)	453.67	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	7.04	3.82	8.44
C & E Loss (ft)	0.02	Cum SA (acres)	1.98	0.36	2.06

Plan: 101015Model Westland Run 3 RS: 600 Profile: 100yr Storm

E.G. Elev (ft)	1000.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.45	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	285.67	143.75	428.32
E.G. Slope (ft/ft)	0.000988	Area (sq ft)	285.67	143.75	428.32
Q Total (cfs)	1283.25	Flow (cfs)	282.92	567.00	433.33
Top Width (ft)	243.11	Top Width (ft)	91.65	18.09	133.37
Vel Total (ft/s)	1.50	Avg. Vel. (ft/s)	0.99	3.94	1.01
Max Chl Dpth (ft)	8.84	Hydr. Depth (ft)	3.12	7.95	3.21
Conv. Total (cfs)	40835.9	Conv. (cfs)	9003.3	18043.2	13789.4
Length Wtd. (ft)	100.00	Wetted Per. (ft)	92.48	19.40	134.31
Min Ch El (ft)	991.61	Shear (lb/sq ft)	0.19	0.46	0.20
Alpha	3.32	Stream Power (lb/ft s)	400.80	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	6.27	3.45	7.79
C & E Loss (ft)	0.01	Cum SA (acres)	1.72	0.31	1.83

Plan: 101015Model Westland Run 3 RS: 500 Profile: 100yr Storm

E.G. Elev (ft)	1000.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.27	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	393.35	175.88	90.11
E.G. Slope (ft/ft)	0.001148	Area (sq ft)	393.35	175.88	90.11
Q Total (cfs)	1283.25	Flow (cfs)	412.67	770.75	99.82
Top Width (ft)	178.02	Top Width (ft)	130.10	21.37	26.55
Vel Total (ft/s)	1.95	Avg. Vel. (ft/s)	1.05	4.38	1.11
Max Chl Dpth (ft)	8.67	Hydr. Depth (ft)	3.02	8.23	3.39
Conv. Total (cfs)	37878.0	Conv. (cfs)	12181.0	22750.5	2946.5
Length Wtd. (ft)	100.00	Wetted Per. (ft)	130.75	22.69	27.60
Min Ch El (ft)	991.60	Shear (lb/sq ft)	0.22	0.56	0.23
Alpha	3.16	Stream Power (lb/ft s)	382.90	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	5.49	3.09	7.20
C & E Loss (ft)	0.03	Cum SA (acres)	1.47	0.27	1.65

Plan: 101015Model Westland Run 3 RS: 400 Profile: 100yr Storm

E.G. Elev (ft)	1000.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.24	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	571.85	180.75	89.49
E.G. Slope (ft/ft)	0.000716	Area (sq ft)	571.85	180.75	89.49
Q Total (cfs)	1283.25	Flow (cfs)	587.31	626.66	69.29
Top Width (ft)	189.61	Top Width (ft)	137.02	20.15	32.45
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)	1.03	3.47	0.77
Max Chl Dpth (ft)	9.77	Hydr. Depth (ft)	4.17	8.97	2.76
Conv. Total (cfs)	47972.3	Conv. (cfs)	21955.5	23426.7	2590.1
Length Wtd. (ft)	100.00	Wetted Per. (ft)	137.68	23.24	32.92
Min Ch El (ft)	990.47	Shear (lb/sq ft)	0.19	0.35	0.12
Alpha	2.75	Stream Power (lb/ft s)	327.35	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	4.38	2.68	6.99
C & E Loss (ft)	0.00	Cum SA (acres)	1.16	0.22	1.58

Plan: 101015Model Westland Run 3 RS: 300 Profile: 100yr Storm

E.G. Elev (ft)	1000.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.14	Reach Len. (ft)	8.00	8.00	8.00
Crit W.S. (ft)	996.31	Flow Area (sq ft)	565.91	159.84	163.71
E.G. Slope (ft/ft)	0.000910	Area (sq ft)	565.91	159.84	163.71
Q Total (cfs)	1283.25	Flow (cfs)	576.30	607.76	99.19
Top Width (ft)	286.54	Top Width (ft)	164.60	18.13	103.80
Vel Total (ft/s)	1.44	Avg. Vel. (ft/s)	1.02	3.80	0.61
Max Chl Dpth (ft)	9.29	Hydr. Depth (ft)	3.44	8.82	1.58
Conv. Total (cfs)	42535.9	Conv. (cfs)	19102.7	20145.4	3287.8
Length Wtd. (ft)	8.00	Wetted Per. (ft)	165.28	21.44	104.19
Min Ch El (ft)	990.85	Shear (lb/sq ft)	0.19	0.42	0.09
Alpha	3.53	Stream Power (lb/ft s)	382.06	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	3.08	2.29	6.70
C & E Loss (ft)	0.01	Cum SA (acres)	0.82	0.18	1.42

Plan: 101015Model Westland Run 3 RS: 292 BR U Profile: 100yr Storm

E.G. Elev (ft)	1000.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.01	Reach Len. (ft)	16.00	16.00	16.00
Crit W.S. (ft)	999.37	Flow Area (sq ft)	279.38	118.09	109.99
E.G. Slope (ft/ft)	0.009425	Area (sq ft)	279.38	118.09	109.99
Q Total (cfs)	1283.25	Flow (cfs)	521.63	610.28	151.34
Top Width (ft)	280.20	Top Width (ft)	164.32	18.13	97.74
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)	1.87	5.17	1.38
Max Chl Dpth (ft)	9.16	Hydr. Depth (ft)	1.70	6.51	1.13
Conv. Total (cfs)	13217.9	Conv. (cfs)	5373.0	6286.1	1558.9
Length Wtd. (ft)	16.00	Wetted Per. (ft)	194.60	57.70	118.16
Min Ch El (ft)	990.85	Shear (lb/sq ft)	0.84	1.20	0.55
Alpha	2.24	Stream Power (lb/ft s)	382.06	0.00	0.00
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	3.00	2.26	6.68
C & E Loss (ft)	0.04	Cum SA (acres)	0.79	0.17	1.40

Plan: 101015Model Westland Run 3 RS: 292 BR D Profile: 100yr Storm

E.G. Elev (ft)	999.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	999.37	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	999.37	Flow Area (sq ft)	175.43	106.58	56.89
E.G. Slope (ft/ft)	0.023470	Area (sq ft)	175.43	106.58	56.89
Q Total (cfs)	1283.25	Flow (cfs)	375.98	811.66	95.62
Top Width (ft)	250.56	Top Width (ft)	163.00	18.13	69.43
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)	2.14	7.62	1.68
Max Chl Dpth (ft)	8.52	Hydr. Depth (ft)	1.08	5.88	0.82
Conv. Total (cfs)	8376.3	Conv. (cfs)	2454.2	5298.0	624.1
Length Wtd. (ft)	1.00	Wetted Per. (ft)	193.14	57.70	89.84
Min Ch El (ft)	990.85	Shear (lb/sq ft)	1.33	2.71	0.93
Alpha	2.67	Stream Power (lb/ft s)	382.06	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	2.92	2.22	6.64
C & E Loss (ft)	0.00	Cum SA (acres)	0.73	0.17	1.37

Plan: 101015Model Westland Run 3 RS: 275 Profile: 100yr Storm

E.G. Elev (ft)	998.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	998.08	Reach Len. (ft)	75.00	75.00	75.00
Crit W.S. (ft)		Flow Area (sq ft)	232.36	122.42	42.07
E.G. Slope (ft/ft)	0.004864	Area (sq ft)	232.36	122.42	42.07
Q Total (cfs)	1283.25	Flow (cfs)	320.83	900.78	61.64
Top Width (ft)	193.61	Top Width (ft)	150.80	18.13	24.68
Vel Total (ft/s)	3.23	Avg. Vel. (ft/s)	1.38	7.36	1.47
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)	1.54	6.75	1.70
Conv. Total (cfs)	18400.1	Conv. (cfs)	4600.3	12916.0	883.9
Length Wtd. (ft)	75.00	Wetted Per. (ft)	151.08	21.44	25.02
Min Ch El (ft)	990.85	Shear (lb/sq ft)	0.47	1.73	0.51
Alpha	3.69	Stream Power (lb/ft s)	382.06	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	2.91	2.22	6.64
C & E Loss (ft)	0.15	Cum SA (acres)	0.72	0.17	1.37

Plan: 101015Model Westland Run 3 RS: 200 Profile: 100yr Storm

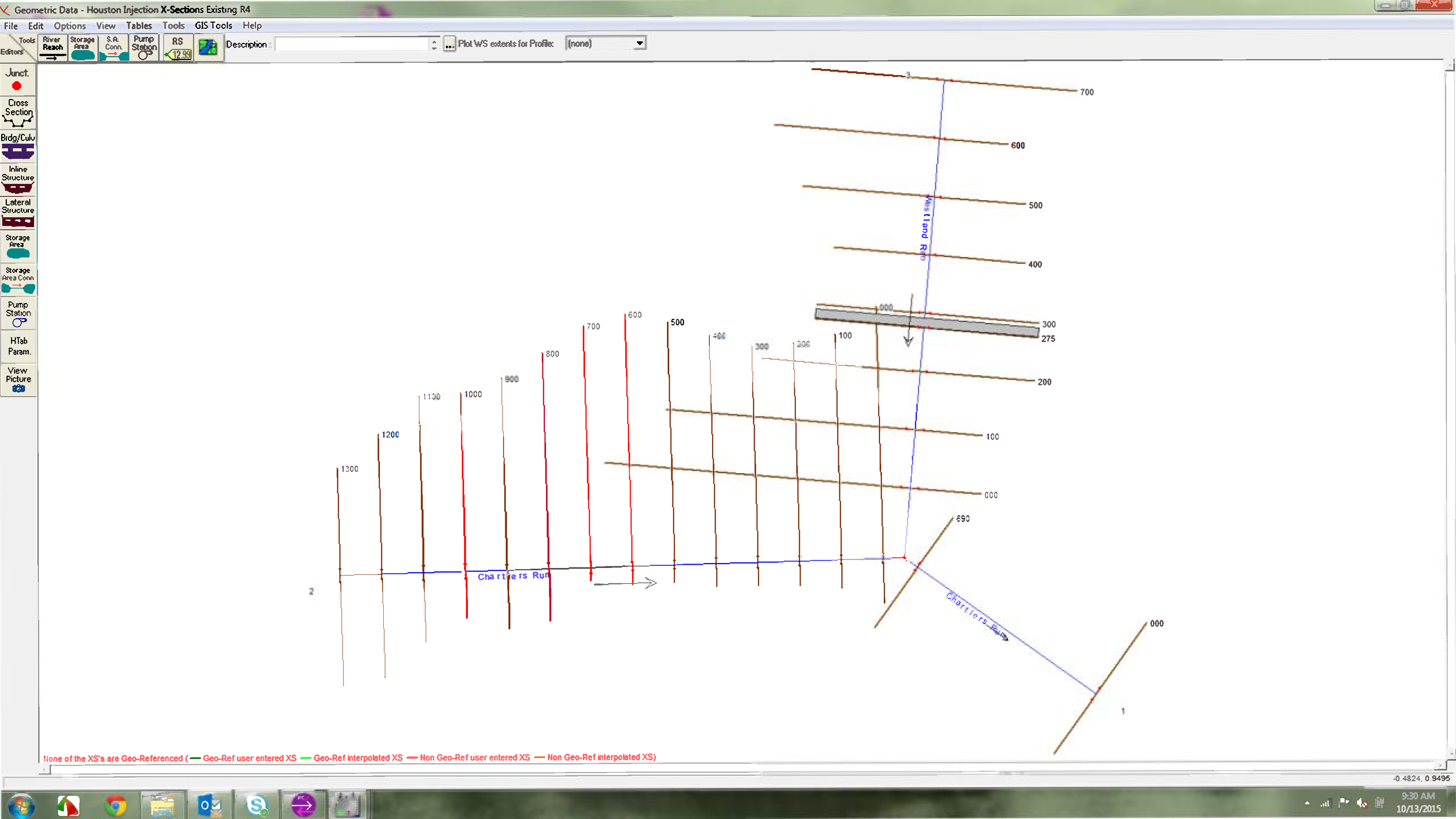
E.G. Elev (ft)	998.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.100	0.045	0.035
W.S. Elev (ft)	998.32	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	413.64	175.62	224.85
E.G. Slope (ft/ft)	0.000736	Area (sq ft)	413.64	175.62	224.85
Q Total (cfs)	1283.25	Flow (cfs)	311.18	549.13	422.94
Top Width (ft)	293.02	Top Width (ft)	162.15	23.22	107.65
Vel Total (ft/s)	1.58	Avg. Vel. (ft/s)	0.75	3.13	1.88
Max Chl Dpth (ft)	8.70	Hydr. Depth (ft)	2.55	7.56	2.09
Conv. Total (cfs)	47301.3	Conv. (cfs)	11470.3	20241.1	15589.9
Length Wtd. (ft)	100.00	Wetted Per. (ft)	162.25	26.93	107.73
Min Ch El (ft)	989.62	Shear (lb/sq ft)	0.12	0.30	0.10
Alpha	2.21	Stream Power (lb/ft s)	467.71	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	2.35	1.96	6.41
C & E Loss (ft)	0.02	Cum SA (acres)	0.45	0.13	1.26

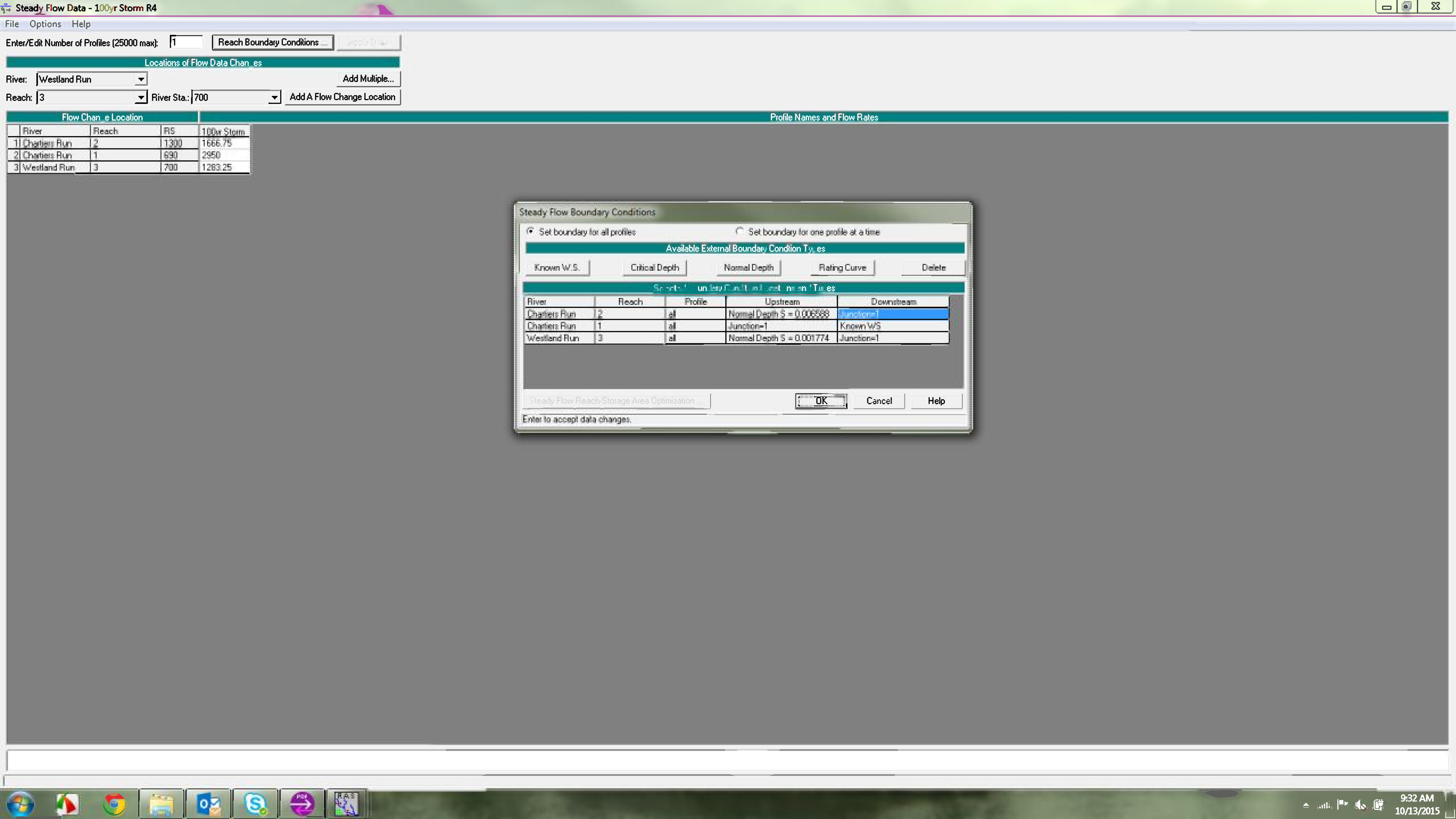
Plan: 101015Model Westland Run 3 RS: 100 Profile: 100yr Storm

E.G. Elev (ft)	998.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.100	0.045	0.035
W.S. Elev (ft)	998.34	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	180.15	233.65	903.74
E.G. Slope (ft/ft)	0.000132	Area (sq ft)	180.15	233.65	903.74
Q Total (cfs)	1283.25	Flow (cfs)	52.89	320.79	909.57
Top Width (ft)	414.41	Top Width (ft)	79.51	30.30	304.60
Vel Total (ft/s)	0.97	Avg. Vel. (ft/s)	0.29	1.37	1.01
Max Chl Dpth (ft)	9.18	Hydr. Depth (ft)	2.27	7.71	2.97
Conv. Total (cfs)	111723.5	Conv. (cfs)	4604.6	27929.0	79190.0
Length Wtd. (ft)	100.00	Wetted Per. (ft)	79.85	33.92	304.79
Min Ch El (ft)	989.16	Shear (lb/sq ft)	0.02	0.06	0.02
Alpha	1.26	Stream Power (lb/ft s)	543.23	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.67	1.49	5.12
C & E Loss (ft)	0.00	Cum SA (acres)	0.18	0.07	0.79

Plan: 101015Model Westland Run 3 RS: 000 Profile: 100yr Storm

E.G. Elev (ft)	998.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.100	0.045	0.035
W.S. Elev (ft)	998.34	Reach Len. (ft)	170.00	170.00	170.00
Crit W.S. (ft)		Flow Area (sq ft)	180.53	263.35	1293.37
E.G. Slope (ft/ft)	0.000061	Area (sq ft)	180.53	263.35	1293.37
Q Total (cfs)	1283.25	Flow (cfs)	38.04	273.55	971.65
Top Width (ft)	483.82	Top Width (ft)	73.68	30.28	379.87
Vel Total (ft/s)	0.74	Avg. Vel. (ft/s)	0.21	1.04	0.75
Max Chl Dpth (ft)	9.47	Hydr. Depth (ft)	2.45	8.70	3.40
Conv. Total (cfs)	164084.0	Conv. (cfs)	4864.4	34978.1	124241.6
Length Wtd. (ft)	170.00	Wetted Per. (ft)	73.93	32.65	380.01
Min Ch El (ft)	988.87	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.21	Stream Power (lb/ft s)	645.48	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	1.26	0.92	2.60
C & E Loss (ft)	0.07	Cum SA (acres)			


Geometric Data - Houston Injection X-Sections Existing R4
File Edit Options View Tables Tools GIS Tools Help
Description
Plot WS extents for Profile:
(none)
Junct.
Cross Section
Brdg/Culv
Inline Structure
Lateral Structure
Storage Area
Storage Area Conn
Pump Station
HTab Param.
View Picture
Chartiers Run
Chartiers Run
None of the XS's are Geo-Referenced (Geo-Ref user entered XS Geo-Ref interpolated XS Non Geo-Ref user entered XS Non Geo-Ref interpolated XS)
-0.4824, 0.9495
9:30 AM
10/13/2015


Steady Flow Data - 100yr Storm R4
File Options Help
Enter/Edit Number of Profiles (25000 max): 1
Reach Boundary Conditions ...
Apply Data
Locations of Flow Data Chan_es
River: Westland Run
Add Multiple...
Reach: 3
River Sta.: 700
Add A Flow Change Location
Flow Chan_e Location
Profile Names and Flow Rates
River | Reach | RS | 100yr Storm
1 Chartiers Run | 2 | 1300 | 1666.75
2 Chartiers Run | 1 | 690 | 2950
3 Westland Run | 3 | 700 | 1283.25
Steady Flow Boundary Conditions
Set boundary for all profiles
Set boundary for one profile at a time
Available External Boundary Condition Ty_es
Known W.S.
Critical Depth
Normal Depth
Rating Curve
Delete
River | Reach | Profile | Upstream | Downstream
Chartiers Run | 2 | all | Normal Depth S = 0.006588 | Junction=1
Chartiers Run | 1 | all | Junction=1 | Known WS
Westland Run | 3 | all | Normal Depth S = 0.001774 | Junction=1
Steady Flow Reach-Storage Area Optimization ...
OK
Cancel
Help
Enter to accept data changes.
9:32 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 1300

Description: 13+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1022
2	11.07	1020
3	20.94	1018
4	31.74	1016
5	49.99	1014
6	61.77	1012
7	97.91	1010
8	114.36	1008
9	125.87	1006
10	150.8	1004
11	164.76	1003.7
12	209.44	1002
13	220.48	1000
14	241.86	999.64
15	248.2	994.3
16	248.83	994.03
17	257.48	992.72
18	266.49	994.07
19	269.08	994.26
20	273.78	1002.86
21	310.1	1004
22	365.51	1004
23	382.39	1004
24	468.73	1006
25	483.56	1008
26	492.69	1010
27	501.23	1012
28	505.96	1014
29	510.6	1016
30	516.34	1018
31	522.21	1020
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

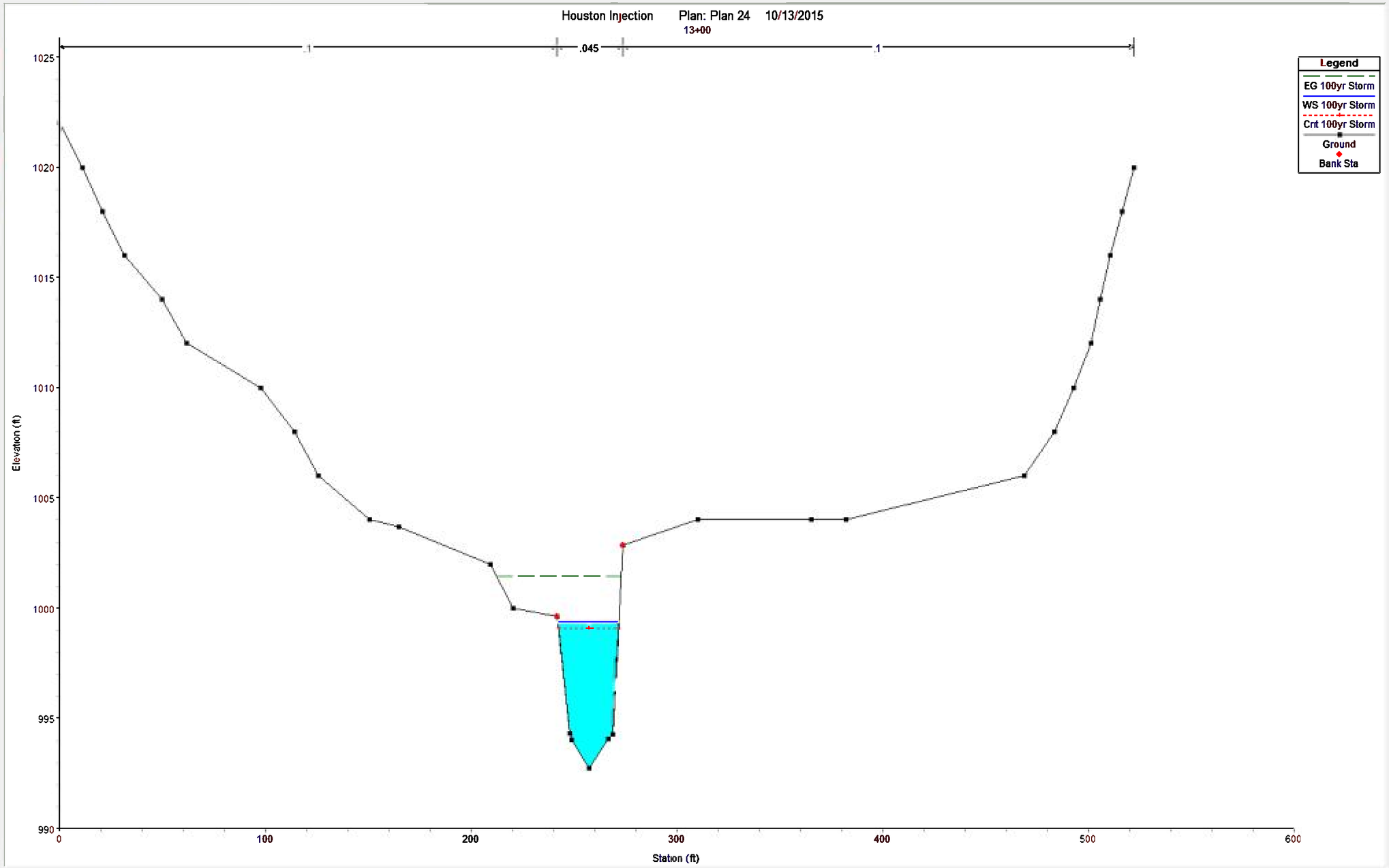
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
241.86	273.78

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:22 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 1200

Description: 12+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1022
2	6.34	1020
3	12.32	1018
4	18.56	1016
5	24.82	1014
6	34.91	1012
7	47.96	1010
8	74.92	1008
9	114.68	1006
10	133.11	1004
11	179.65	1002
12	263.05	999
13	325.95	995
14	328.64	994.32
15	330.02	993.89
16	335.85	993.28
17	342.23	993.95
18	344.59	994.23
19	347.57	995.41
20	526.28	1008
21	539.84	1010
22	550.59	1012
23	559.5	1014
24	568.23	1016
25	576.34	1018
26	583.58	1020
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

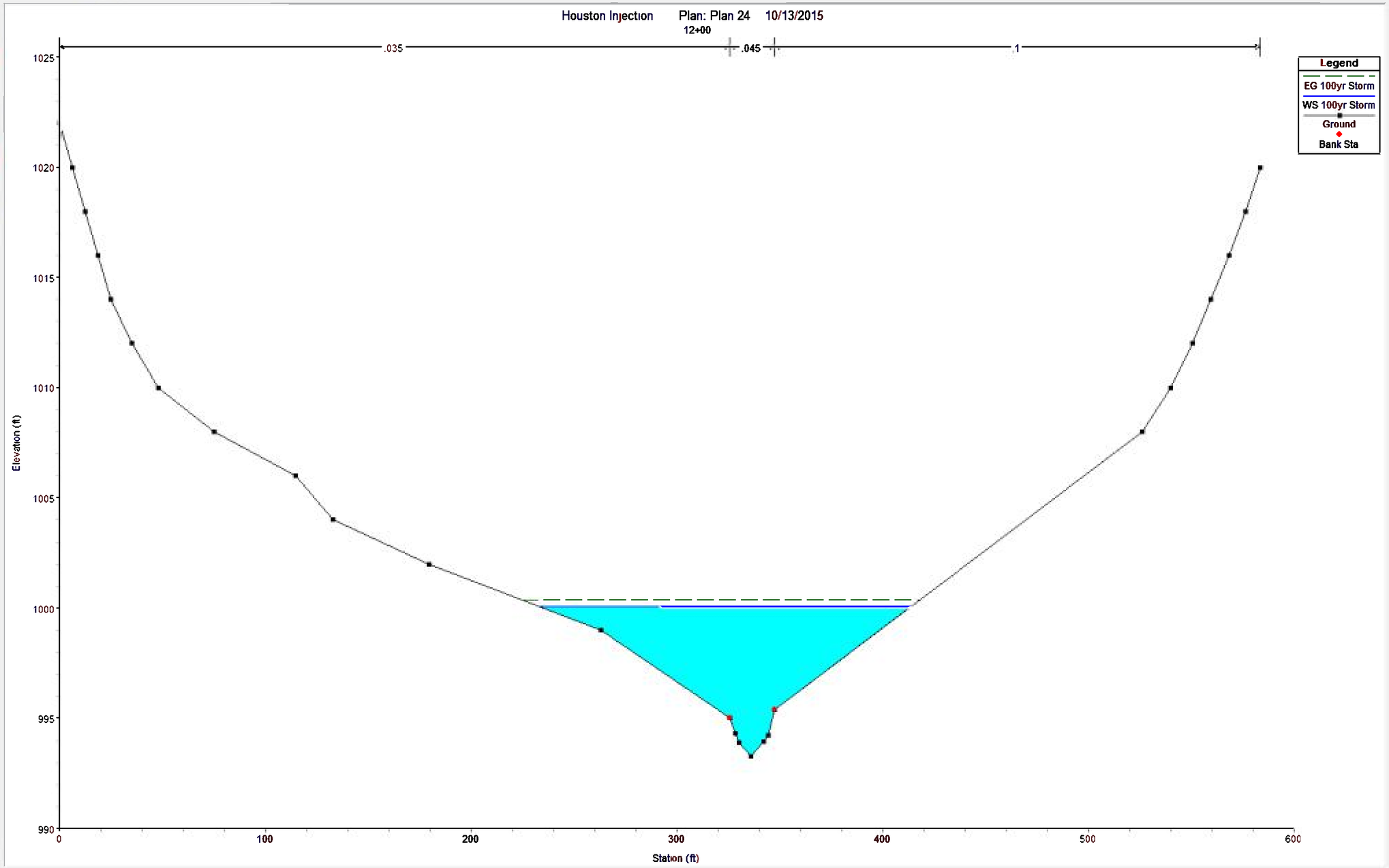
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
325.95	347.57

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:22 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 1100

Description: 11+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1020
2	5.56	1018
3	11.69	1016
4	17.69	1014
5	23.49	1012
6	32.37	1010
7	57	1008
8	90.4	1006
9	102.86	1004
10	141.39	1002
11	252.85	1000
12	324.8	998.7
13	376.75	997
14	407.3	995.87
15	410.28	993.33
16	410.45	993.34
17	424.95	990.76
18	435.44	993.29
19	436.12	993.53
20	441.29	999.99
21	481.01	1008
22	541.23	1010
23	557.62	1012
24	570.21	1014
25	577.45	1016
26	584.32	1018
27	591.16	1020

Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

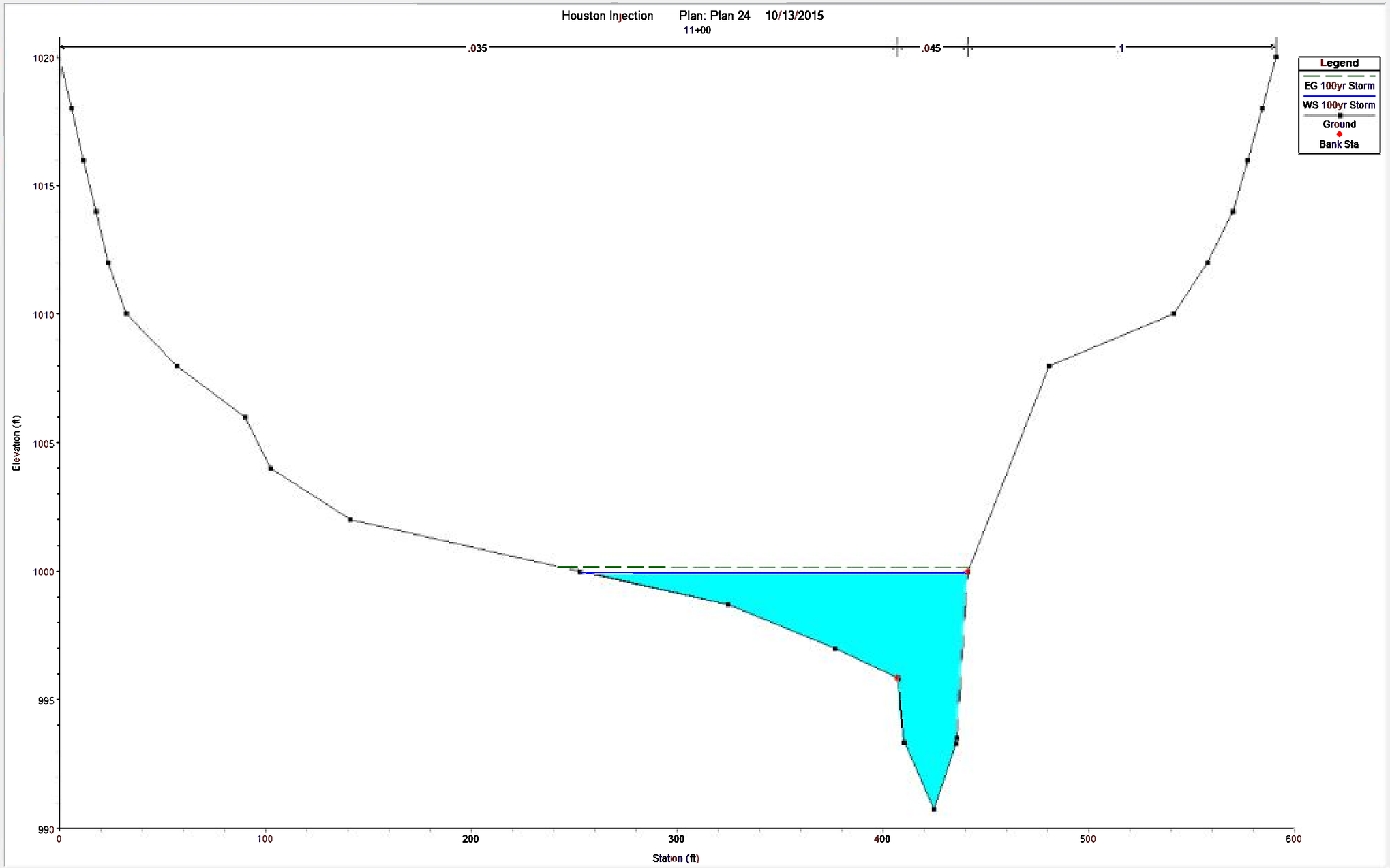
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
407.3	441.29

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:22 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4 [redacted]

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 2 | River Sta.: 1000

Description: 10+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	4.56	1016
3	10.03	1014
4	16.12	1012
5	24.25	1010
6	68.33	1008
7	85.19	1006
8	104.4	1004
9	164.4	1002
10	258.05	1000
11	410.45	997.45
12	412.99	993.5
13	413.63	993.25
14	424.72	993.2
15	444.4	992.71
16	444.68	992.61
17	444.8	995.57
18	463.16	1002
19	488.84	1002
20	493.82	1004
21	502.09	1006
22	513.73	1008
23	523.1	1010
24	529.27	1012
25	538.81	1014
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

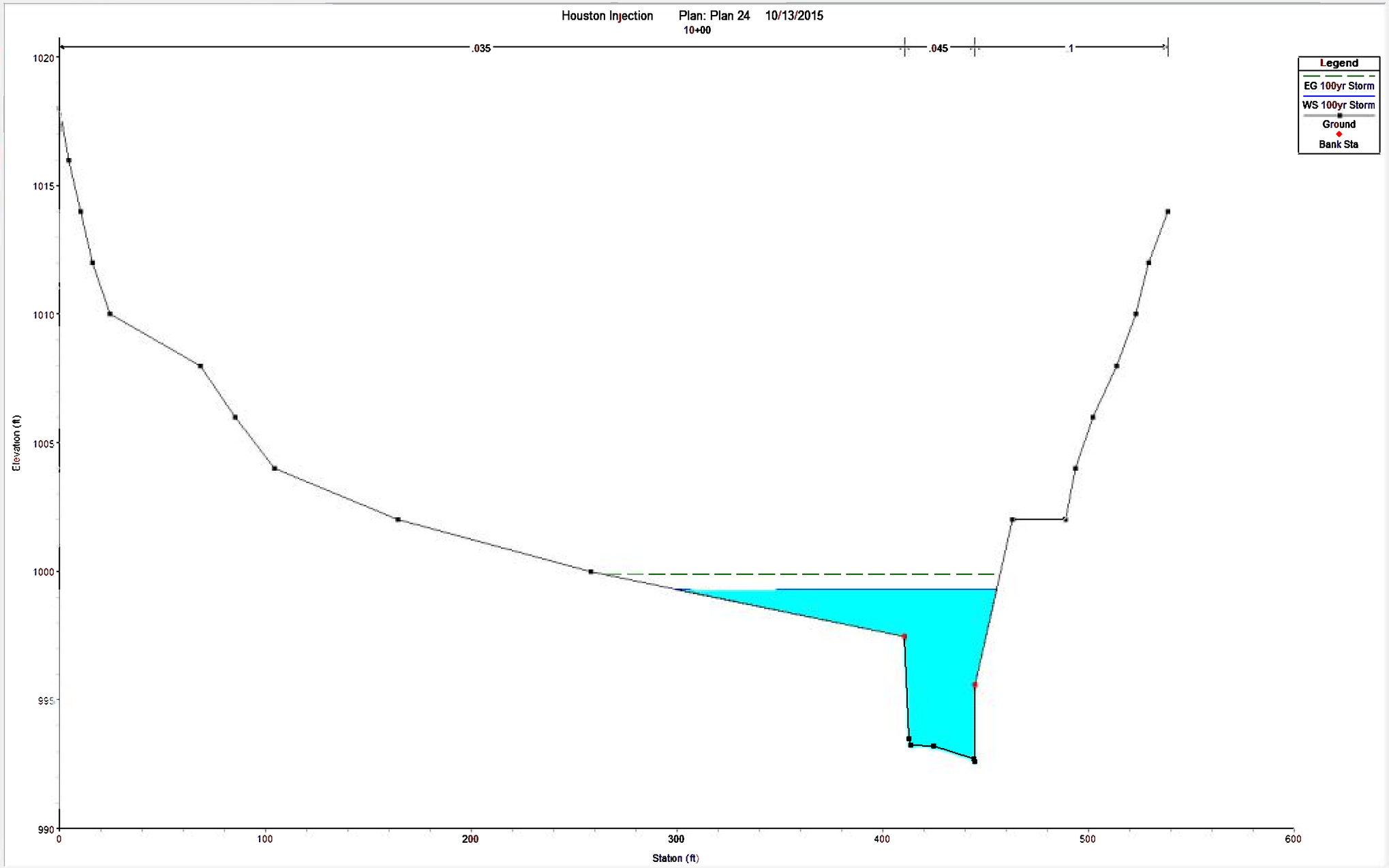
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
410.45	444.8

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:23 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 2 | River Sta.: 900

Description: 9+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	5.23	1016
3	10.73	1014
4	17.6	1012
5	32.87	1010
6	63.06	1009.01
7	98.76	1008
8	125.63	1006
9	219.27	1004
10	260.04	1002
11	318.57	1000
12	386.21	998
13	449.32	996.78
14	455.58	992.73
15	456.44	992.36
16	463.97	991.03
17	472.18	992.35
18	472.73	992.49
19	474	993.9
20	542.58	997
21	561.7	1000
22	566.33	1002
23	570.19	1004
24	574.97	1006
25	581.02	1008
26	587.22	1010
27	593.8	1012
28	600.84	1014
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

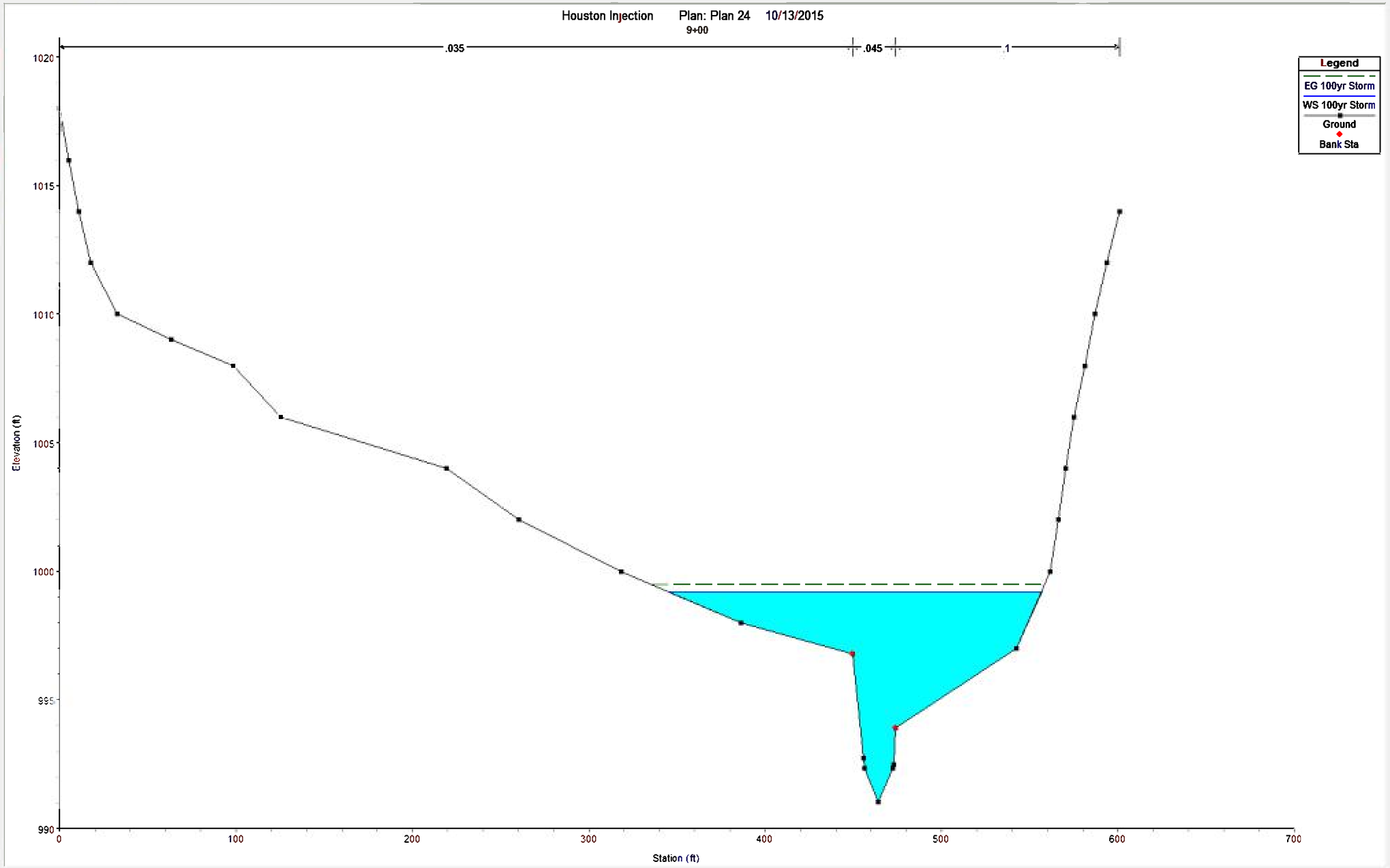
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
449.32	474

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 2 | River Sta.: 800

Description: 8+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1020
2	19.45	1018
3	26.39	1016
4	31.97	1014
5	37.47	1012
6	48.15	1010
7	129.59	1008
8	168.44	1006
9	245.01	1004
10	291.83	1002
11	340.73	1000
12	426.05	998
13	496.92	996
14	504.12	996.79
15	508.56	992.47
16	509.61	991.92
17	517.95	990.97
18	526.71	991.92
19	530.58	992.42
20	532.68	993.34
21	540.9	994
22	578.32	996
23	584.86	998
24	589.05	1000
25	593.45	1002
26	599.36	1002.6
27	620.86	1004
28	632.98	1006
29	638.18	1008
30	640.47	1010
31	642.81	1012
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

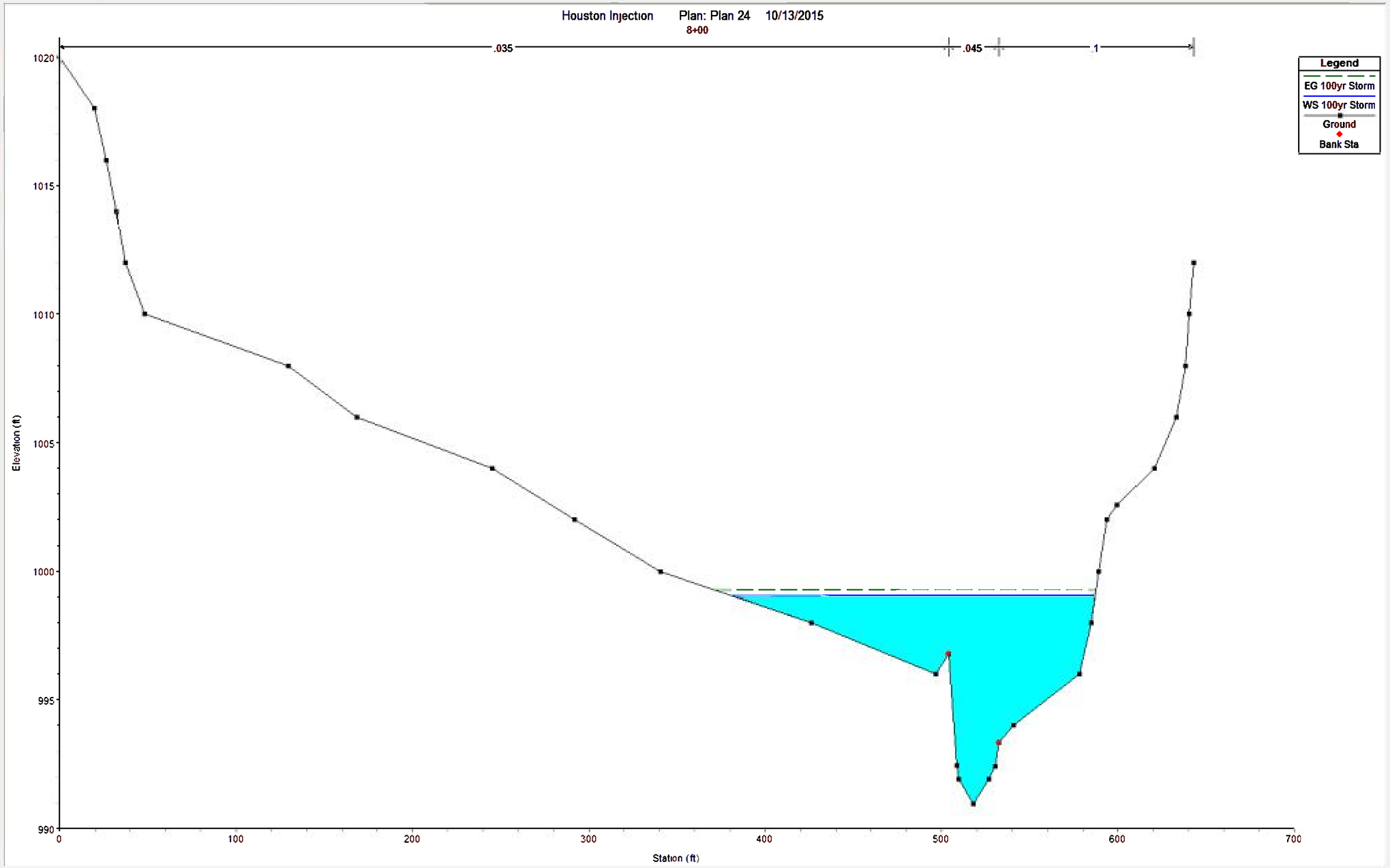
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
504.12	532.68

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:25 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 700

Description: 7+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	8.32	1016
3	31.4	1014
4	48.64	1012
5	65.7	1010
6	115.56	1008
7	130.19	1006
8	214.37	1004
9	269.16	1002
10	304.44	1000.89
11	335.41	1000
12	456.48	998
13	518.32	998
14	542.34	998
15	547.32	994
16	567.4	993.59
17	569.75	991.78
18	570.79	991.23
19	583.23	990.34
20	594.92	991.58
21	595.26	991.83
22	595.92	994.75
23	611.69	1013
24	614.49	1014
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

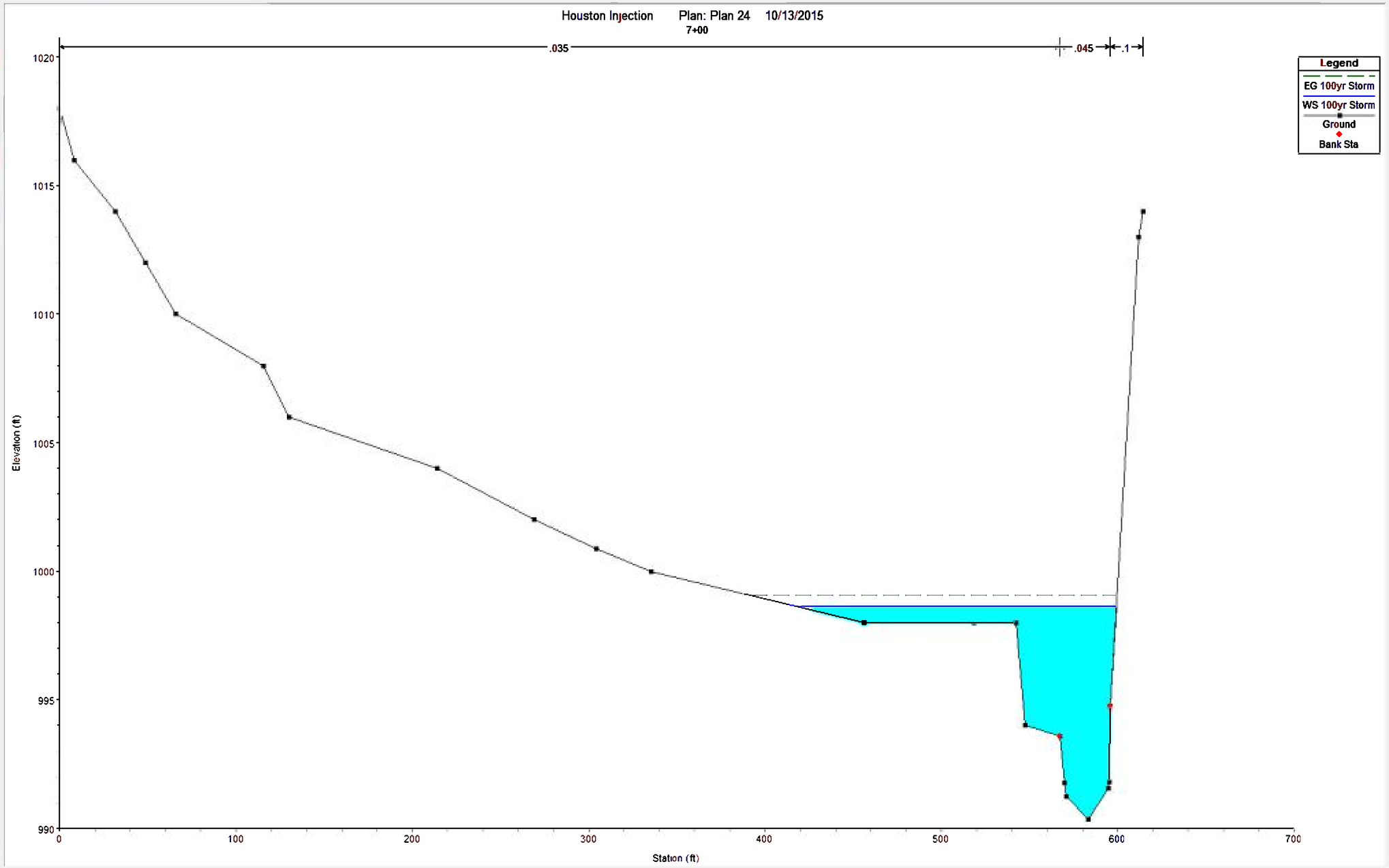
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
567.4	595.92

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:25 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 2 | River Sta.: 600

Description: 6+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	8.28	1016
3	17.93	1014
4	24.97	1012
5	64.42	1010
6	109.73	1008
7	134.72	1006
8	209.95	1004
9	262.21	1002
10	285.57	1001.19
11	328.45	1000
12	414.43	997
13	594.77	993.07
14	596.71	992.38
15	596.94	991.44
16	604.59	990.85
17	612.65	991.44
18	613.49	991.63
19	614.48	992.64
20	644.96	1007
21	649.16	1010
22–51		

Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

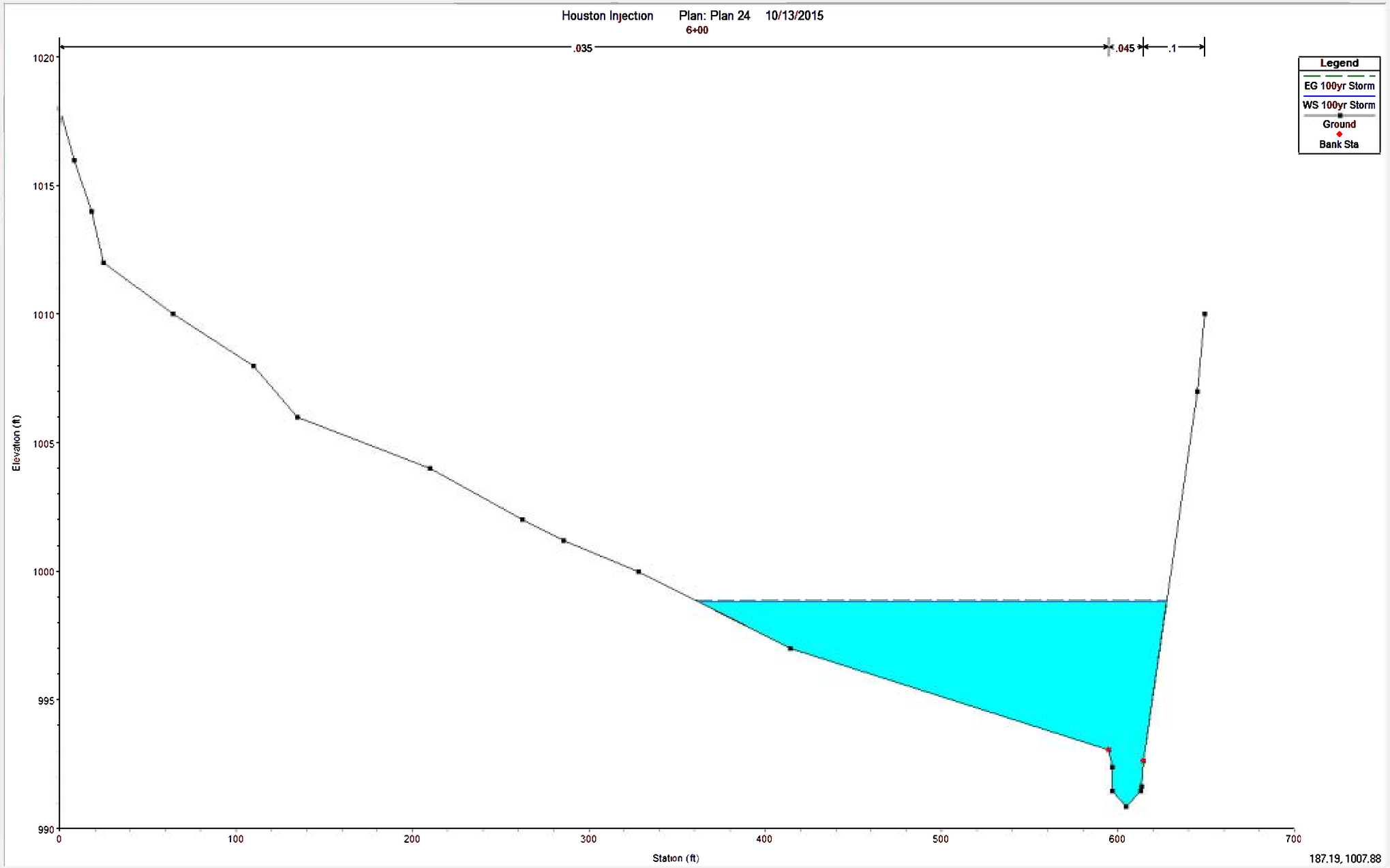
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
594.77	614.48

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:25 AM 10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 500

Description: 5+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	7.61	1016
3	14.82	1014
4	28.12	1012
5	77.14	1010
6	105.48	1008
7	169.46	1006
8	204.58	1004
9	246.73	1002
10	265.12	1001.15
11	289.81	1000
12	393.16	998
13	556.64	994.5
14	574.81	993.73
15	577.67	991.19
16	578.9	990.88
17	585.96	989.8
18	592.87	991.16
19	593.94	991.28
20	594.81	992.76
21	619.22	1017
22	626.63	1020
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

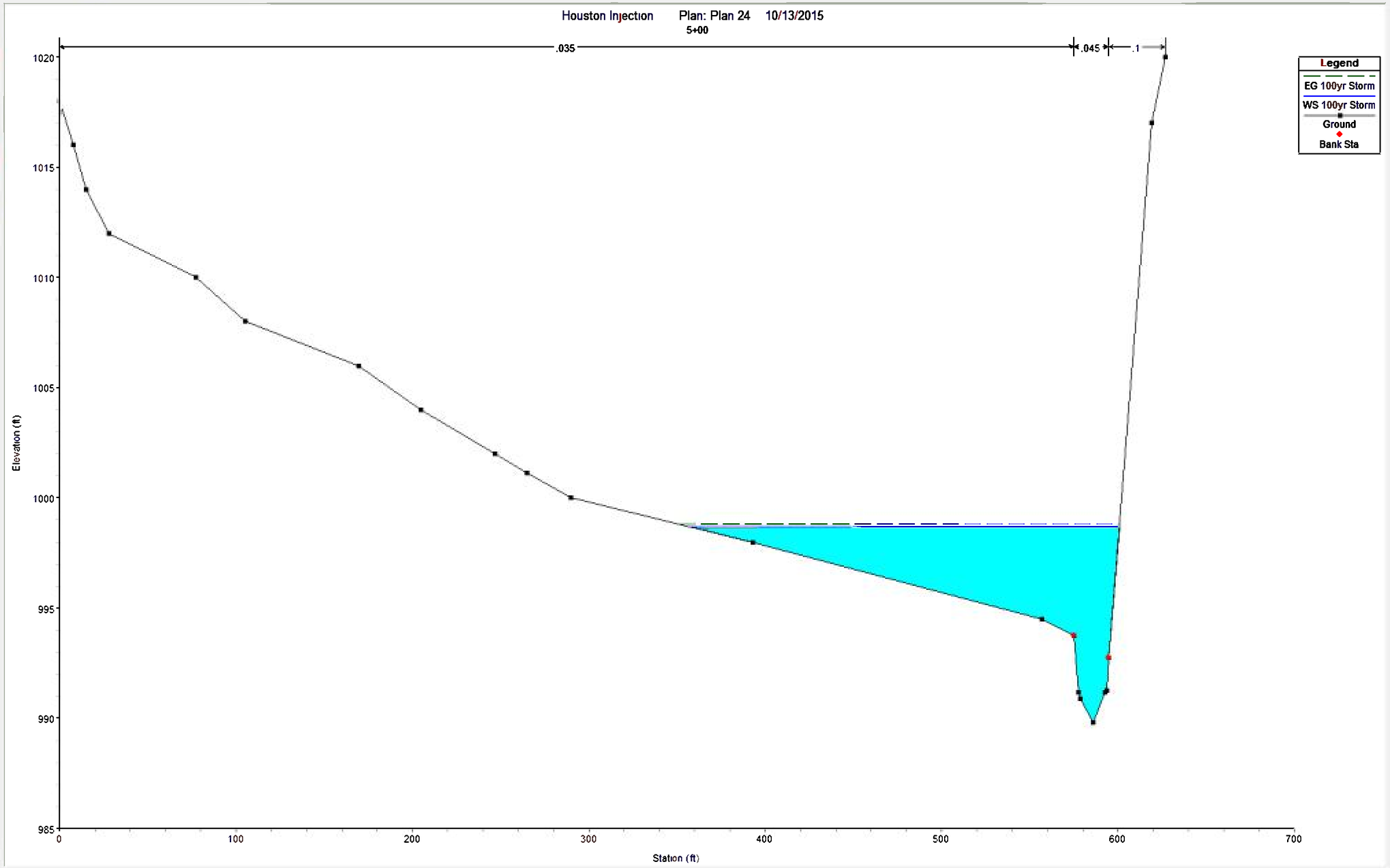
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
574.81	594.81

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:26 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 2 | River Sta.: 400

Description: 4+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1020
2	8.4	1018
3	16.74	1016
4	30.8	1014
5	87.62	1012
6	94.14	1010
7	112.83	1008
8	180.85	1006
9	197.47	1004
10	214.14	1002
11	268.8	1000
12	352.86	998.14
13	390.23	997.06
14	521.56	996
15	536.02	994.67
16	539.35	991.14
17	540.71	990.65
18	547.75	990.57
19	554.17	990.7
20	559.04	991.62
21	561.11	995.02
22	577.68	1007
23	599.84	1010
24	605.13	1012
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

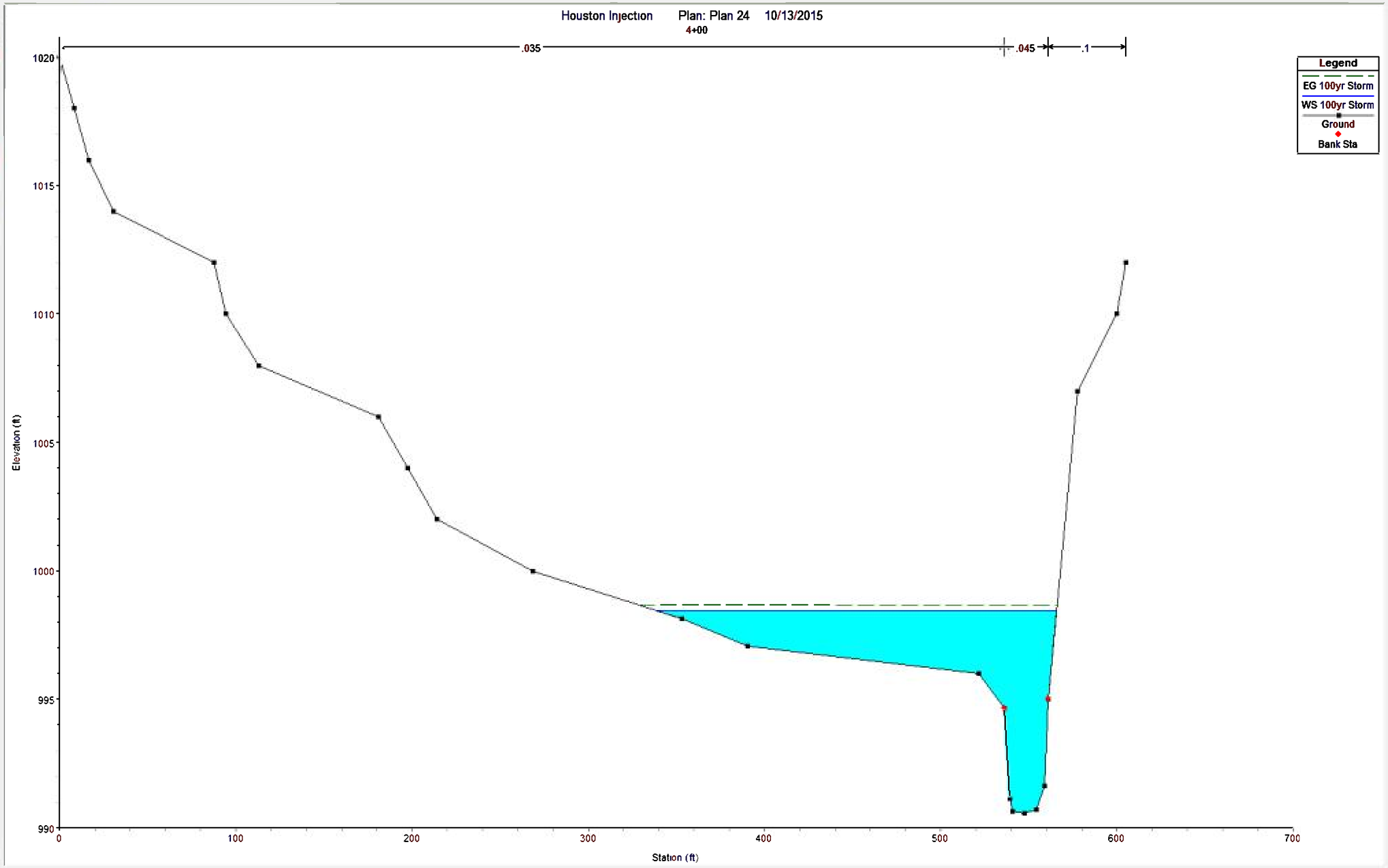
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
536.02	561.11

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:26 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 300

Description: 3+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1016
2	13.91	1014
3	69.69	1012
4	108.77	1010
5	117.37	1008
6	151.47	1006
7	154.28	1005.17
8	170.01	1004
9	190.52	1002
10	215.39	1000
11	344.83	998
12	421.22	995.81
13	497.59	996
14	506.88	995.33
15	509.96	990.82
16	510.96	990.36
17	517.04	990.15
18	522.36	990.36
19	530.74	991.22
20	533.86	993.31
21	543.96	996
22	554.93	998
23	558.65	1000
24	561.82	1002
25	564.69	1004
26	567.54	1006
27	570.49	1008
28	574.04	1010
29	578.12	1012
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

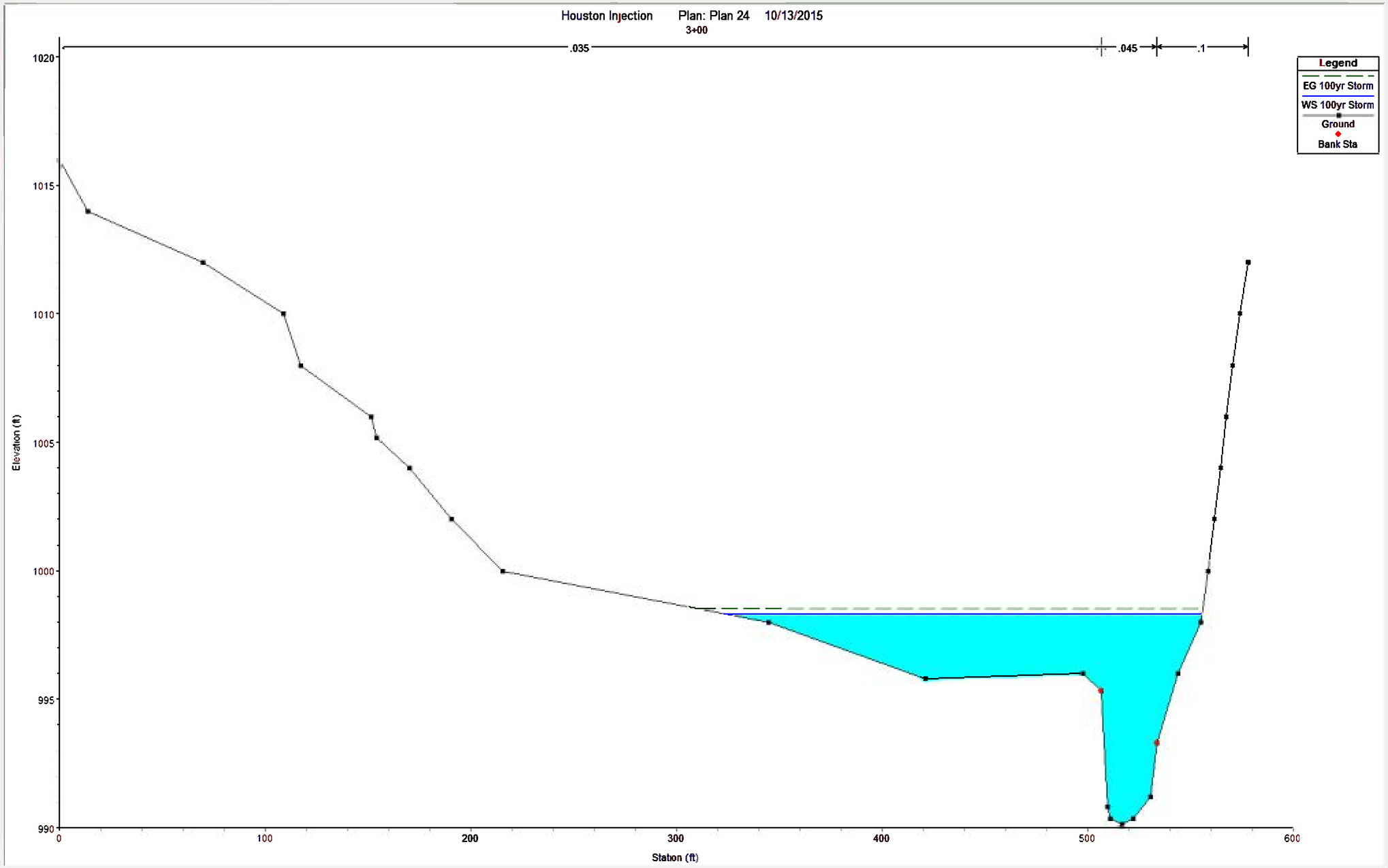
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
506.88	533.86

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:26 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 2 | River Sta.: 200

Description: 2+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1016
2	34.24	1014
3	54.23	1012
4	88.6	1010
5	105.26	1008
6	110.95	1006
7	134.75	1004
8	155.42	1002.4
9	157.81	1002
10	183.48	1000
11	222.22	998
12	441.46	995.02
13	503.4	994
14	512.46	993.6
15	516.73	990.33
16	517.06	990.2
17	524.95	989.49
18	531.11	990.03
19	531.36	990.1
20	532.92	992.04
21	553.69	994
22	559.79	998
23	564.6	1000
24	568.47	1002
25	571.85	1004
26	575.03	1006
27	578.47	1008
28	581.57	1010
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

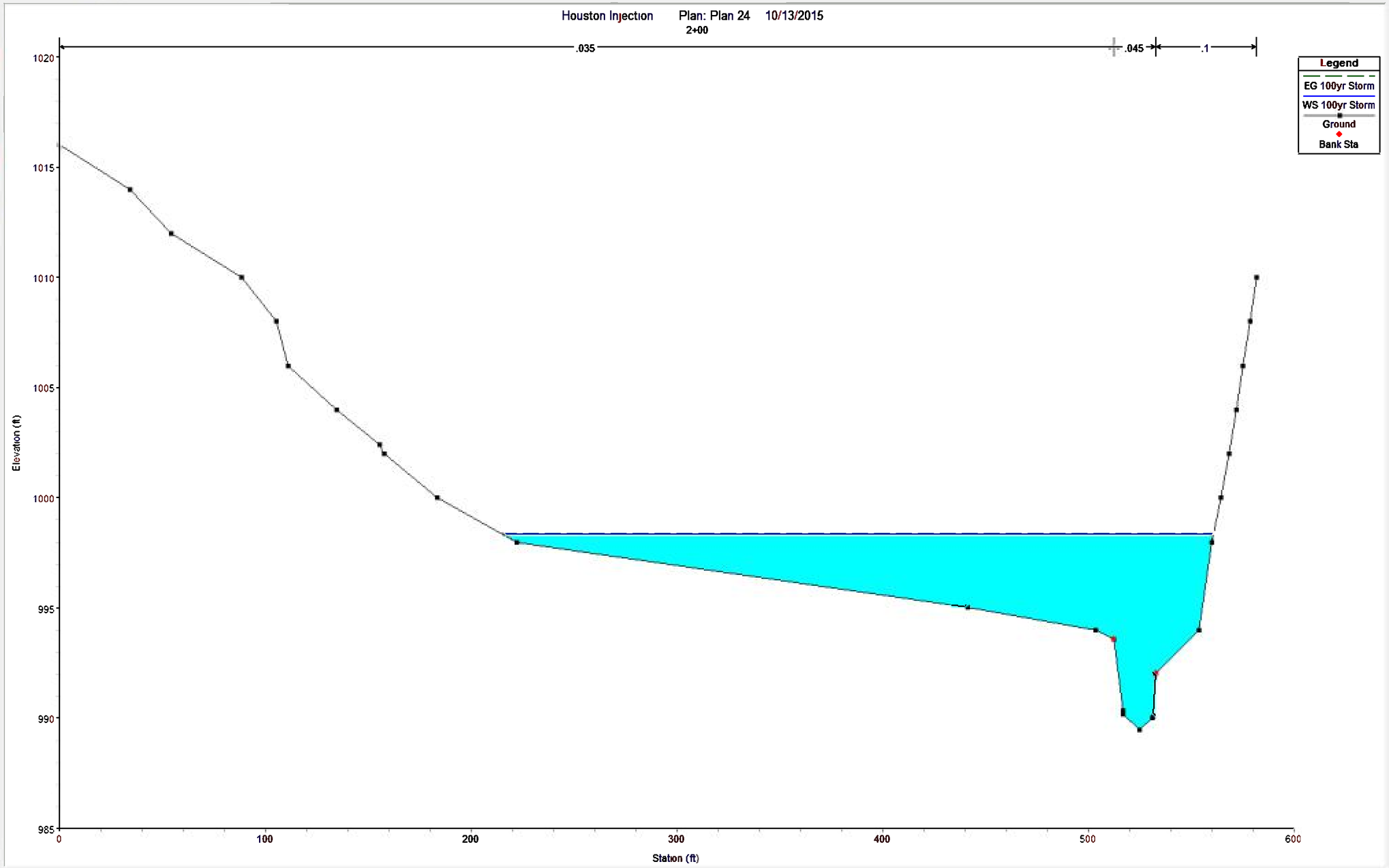
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
512.46	532.92

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:27 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4 [redacted]

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 100

Description: 1+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1016
2	18.49	1014
3	33	1012
4	57.1	1010
5	95.37	1008
6	101.51	1006
7	105.78	1004
8	121.71	1002
9	153.3	1000
10	156.48	999.9
11	321.97	996.18
12	388.78	996
13	456.12	994.2
14	530.11	993.13
15	531.92	990.21
16	532.37	990.09
17	541.57	989.94
18	550.34	990.46
19	550.61	990.82
20	588.39	998
21	596.38	1000
22	599.1	1002
23	601.43	1004
24	603.89	1006
25	606.39	1008
26	609.02	1010

Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

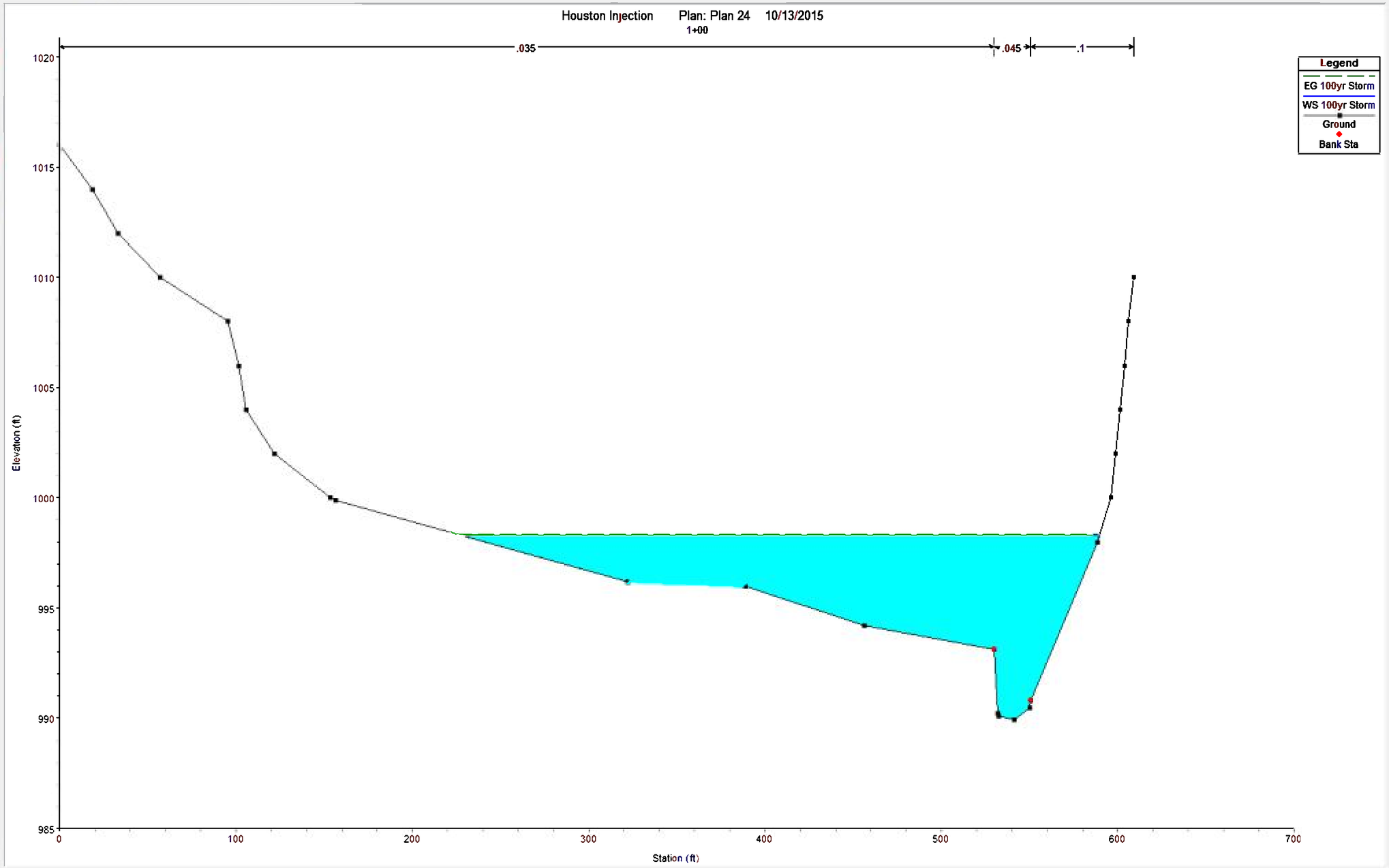
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
530.11	550.61

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:27 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Chartiers Run Apply Data

Reach: 2 River Sta.: 000

Description: 0+00

Del Row Ins Row

	Station	Elevation
1	0	1016
2	38.1	1014
3	49.42	1012
4	58.9	1010
5	78.48	1008
6	110.64	1006
7	116.83	1004
8	123.89	1002
9	144.04	1000
10	168.76	998
11	171.2	997.18
12	272.4	996
13	316.29	995.75
14	405.94	993.92
15	582.13	994
16	593.22	990.81
17	594.99	990.31
18	595.58	990.32
19	604.62	989.88
20	612.46	990.26
21	613.01	990.33
22	615.31	990.86
23	648.51	996
24	655.74	998
25	666.41	1000
26	688.85	1002
27	697.85	1004
28	702.06	1006
29	705.65	1008
30	708.85	1010
31	711.9	1012

Downstream Reach Lengths

LOB	Channel	ROB

Manning's n Values

LOB	Channel	ROB
0.035	0.045	0.1

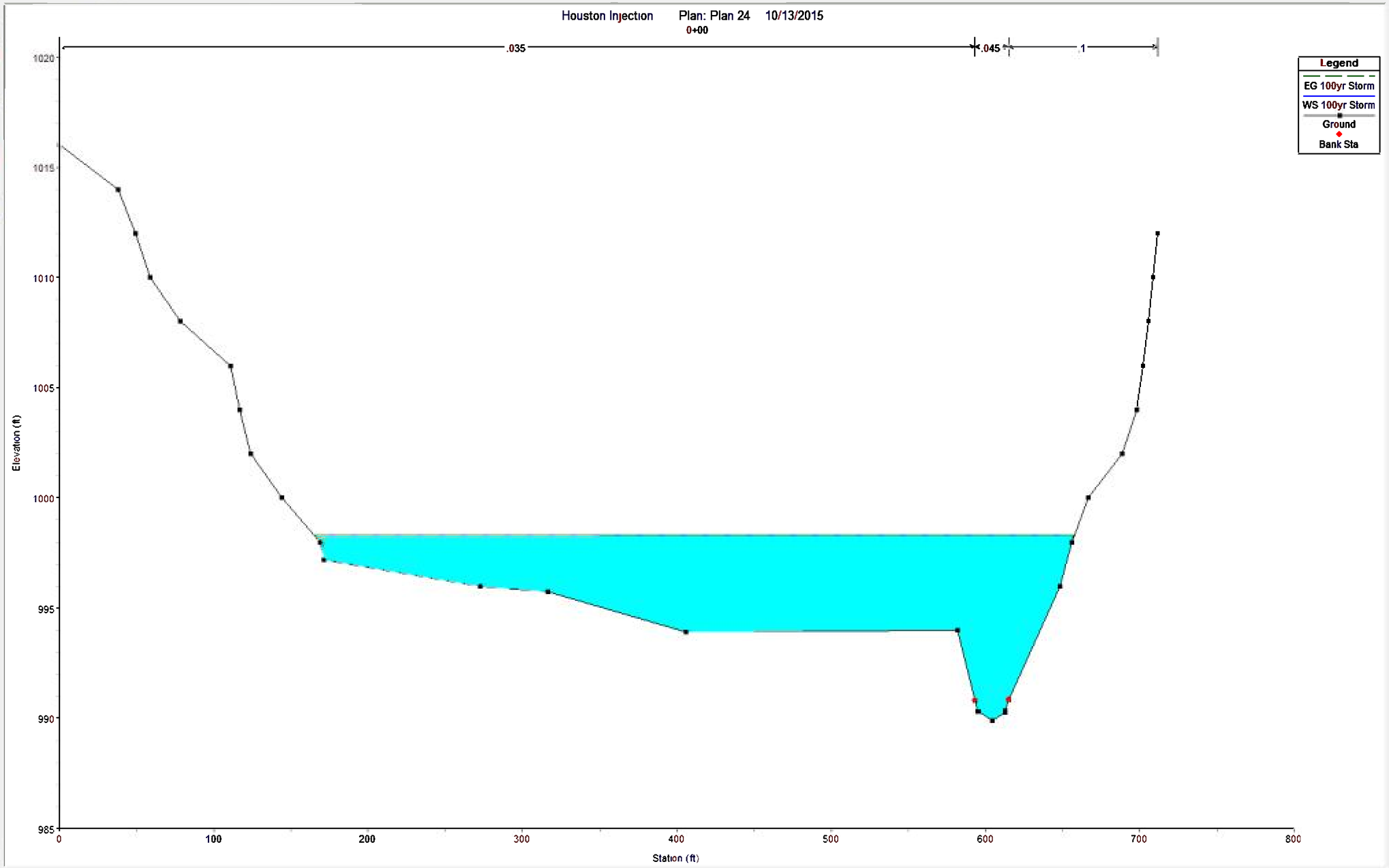
Main Channel Bank Stations

Left Bank	Right Bank
593.22	615.31

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3

Plot Options Keep Prev XS Plots Clear Prev



Select river station for cross section editing.

9:27 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4 [redacted]

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 1 | River Sta.: [redacted]

Description: 0

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.83	1008.45
3	7.56	1006.45
4	12.24	1004.45
5	47.44	1002.45
6	51.87	1000.45
7	58.45	998.45
8	72.21	996.45
9	109.85	994.45
10	128.4	992.45
11	147.98	990.45
12	159.7	990.45
13	161.79	992.45
14	175.45	992.45
15	179.32	992.09
16	180.95	988.98
17	181.24	988.97
18	190.12	989.1
19	200.05	989.75
20	205.48	991.62
21	206.48	992.45
22	210.98	994.45
23	215.83	996.45
24	225.48	998.45
25	235.58	1000.45
26	249.66	1002.45
27	327.39	1003.59
28	419.76	1004.45
29	422.29	1006.45
30	424.19	1008.45
31	425.67	1010.45

Downstream Reach Lengths

LOB	Channel	ROB
690	690	690

Manning's n Values

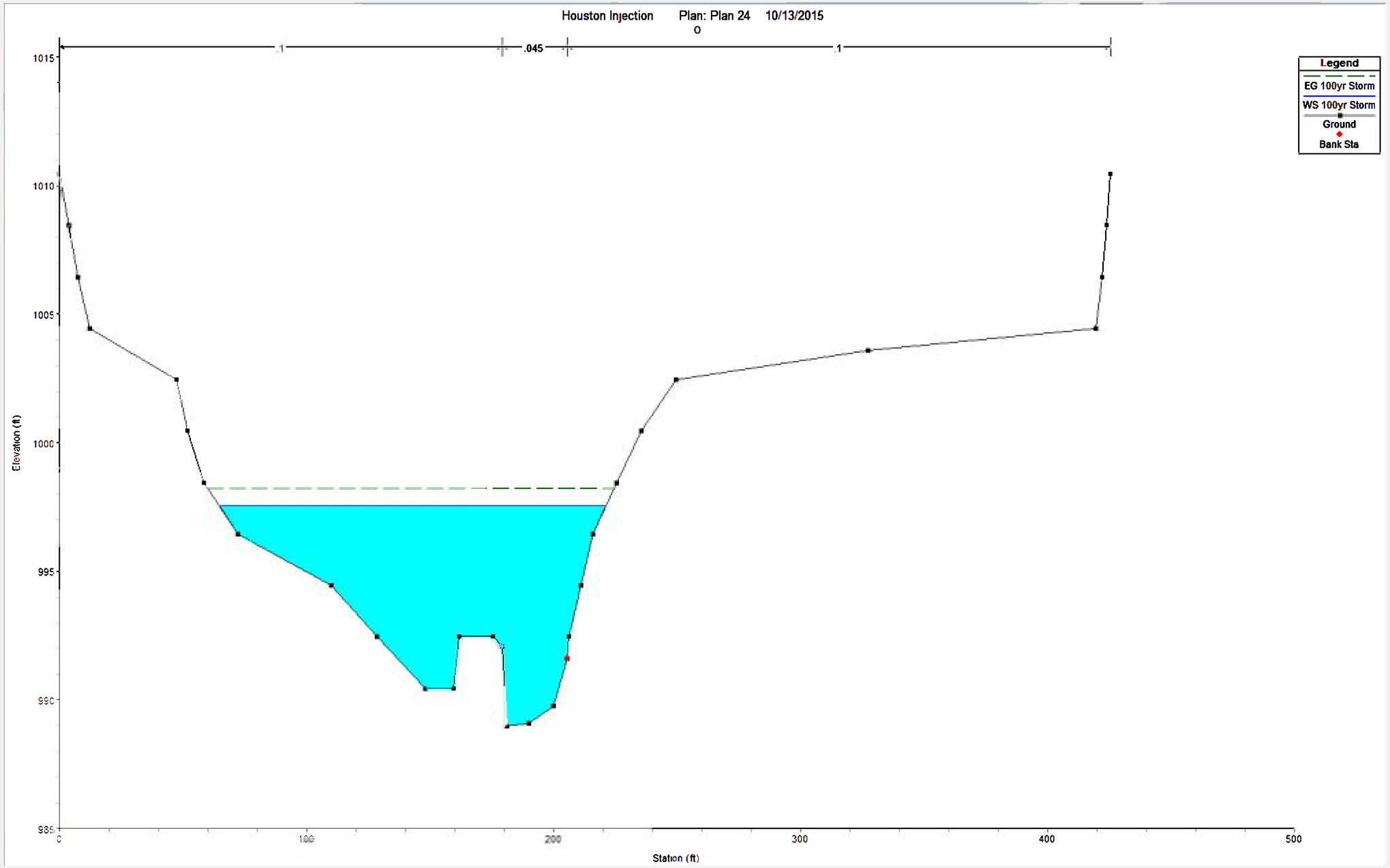
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
179.32	205.48

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:20 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4 [redacted]

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 1 | River Sta.: [redacted]

Description: N

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	1715	1006.3
2	1725	1000.4
3	1773	1000.4
4	1782	1001.8
5	1793	1001.8
6	1808	1001.4
7	1832	999.9
8	1850	993.4
9	1866	993.3
10	1901	992.3
11	1970	990.6
12	1987	986.7
13	1997	986.2
14	2000	985.9
15	2005	985.7
16	2006	986.2
17	2013	990.8
18	2038	990.3
19	2084	991.9
20	2098	998.9
21	2145	999.3
22	2222	1007
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

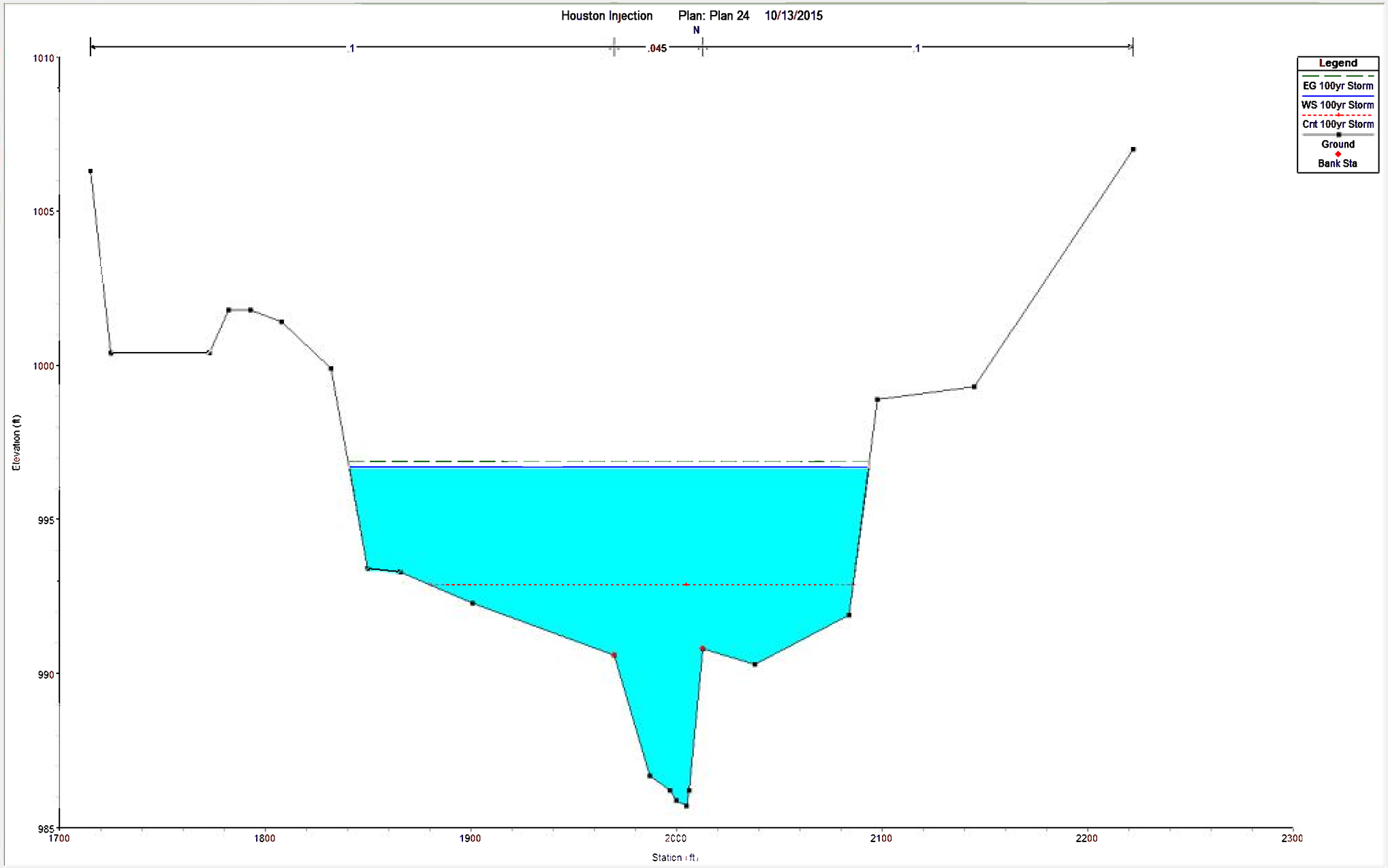
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
1970	2013

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:19 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Westland Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 3 | River Sta.: 700

Description: 7+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	19.55	1008.45
3	32.84	1006.45
4	45.16	1004.45
5	60.48	1002.45
6	83.63	1000.45
7	105	998.45
8	199.77	996.45
9	215.09	995.25
10	216.25	993.4
11	216.84	992.88
12	221.96	992.52
13	226.8	992.87
14	234.82	992.86
15	239.2	996.42
16	241.34	996.45
17	244.65	998.45
18	271.7	998.45
19	295.52	998.45
20	303.77	1000.45
21	335.24	1001.1
22	401.57	1002.45
23	429.04	1004.45
24	434.97	1006.45
25	437.76	1008.45
26	440.58	1010.45
27	443.43	1012.45
28	445.83	1014.45
29	448.43	1016.45
30	451.05	1018.45
31	453.67	1020.45
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

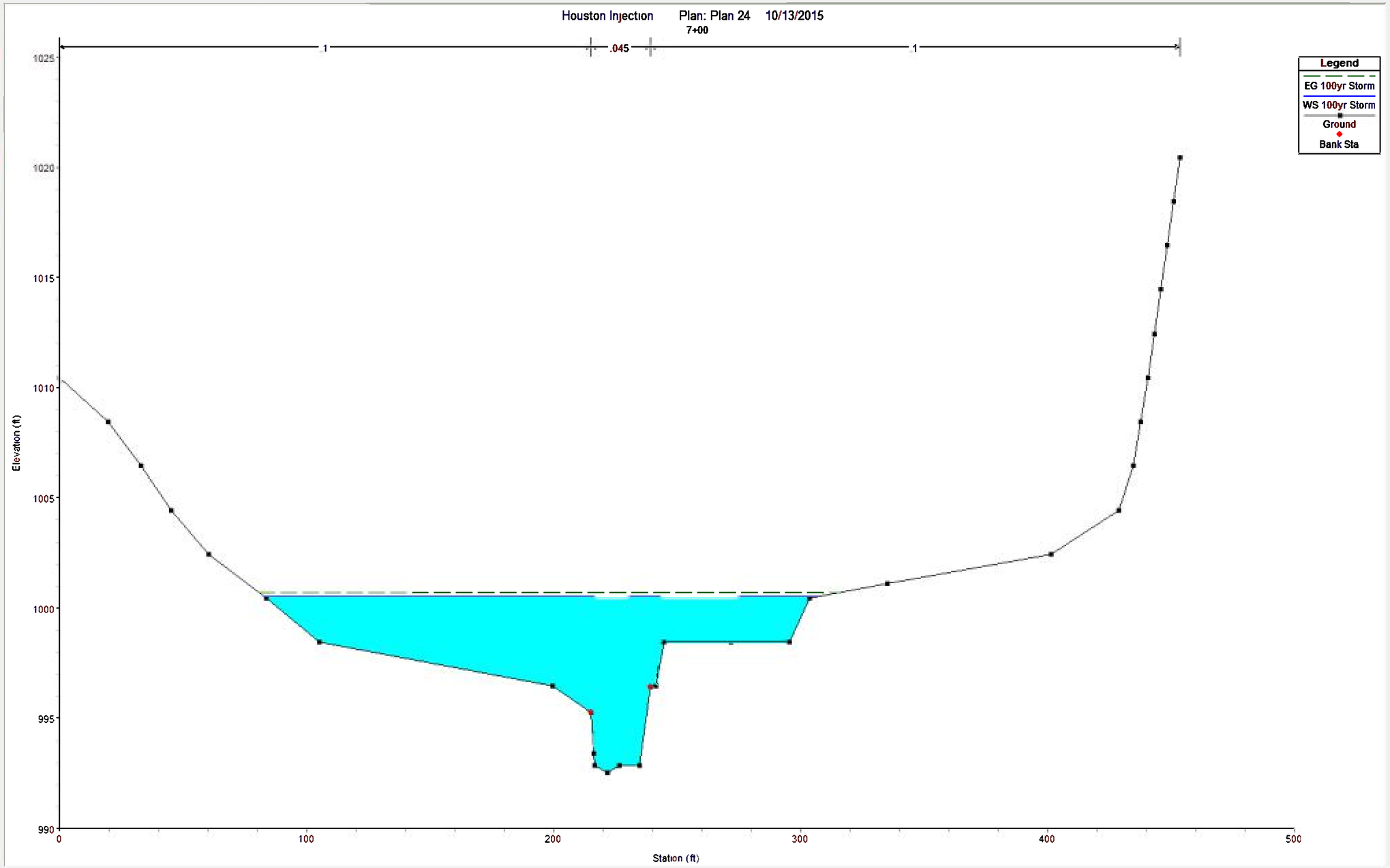
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
215.09	239.2

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river for cross section editing

9:28 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Westland Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 3 | River Sta.: 600

Description: 6+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	2.65	1008.45
3	5.6	1006.45
4	9.02	1004.45
5	12.9	1002.45
6	17.22	1000.45
7	24.53	998.45
8	98.22	996.45
9	102.18	994.45
10	108.86	995.33
11	111.12	992.92
12	112.83	992.29
13	116.79	991.61
14	120.05	992.21
15	122.46	992.44
16	126.95	992.92
17	134.4	994.45
18	151.84	996.45
19	161.39	998.45
20	188.75	998.45
21	232.09	996.45
22	239.86	996.45
23	252.57	998.45
24	260.19	1000.45
25	329.76	1002.45
26	366.35	1004.45
27	376.68	1006.45
28	386.51	1008.45
29	392.81	1010.45
30	396.78	1012.45
31	400.8	1014.45
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51		

Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

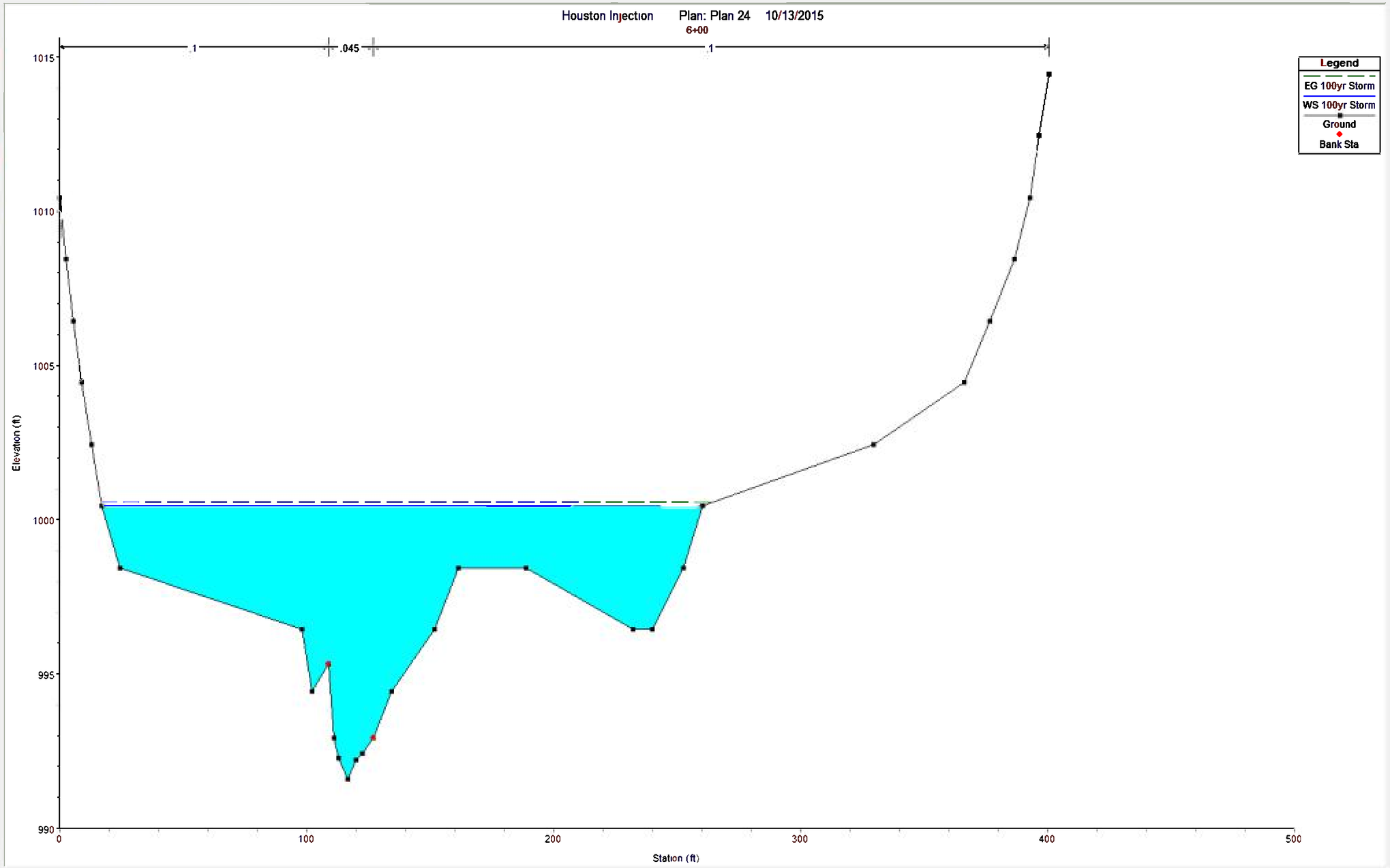
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
108.86	126.95

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:28 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: [redacted]

Description: 5+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.08	1008.45
3	6.16	1006.45
4	9.23	1004.45
5	12.31	1002.45
6	15.44	1000.45
7	19.05	998.45
8	122.08	996.6
9	130.35	996.45
10	144.22	994.45
11	145.87	994.28
12	146.95	992.58
13	148.02	992.28
14	157.18	991.6
15	166.49	992.18
16	166.94	992.63
17	167.24	992.91
18	172.62	994.45
19	178.98	996.45
20	184.49	998.45
21	194.71	1000.45
22	356.68	1002.45
23	369.21	1004.45
24	379.49	1008.45
25	382.9	1010.45

Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

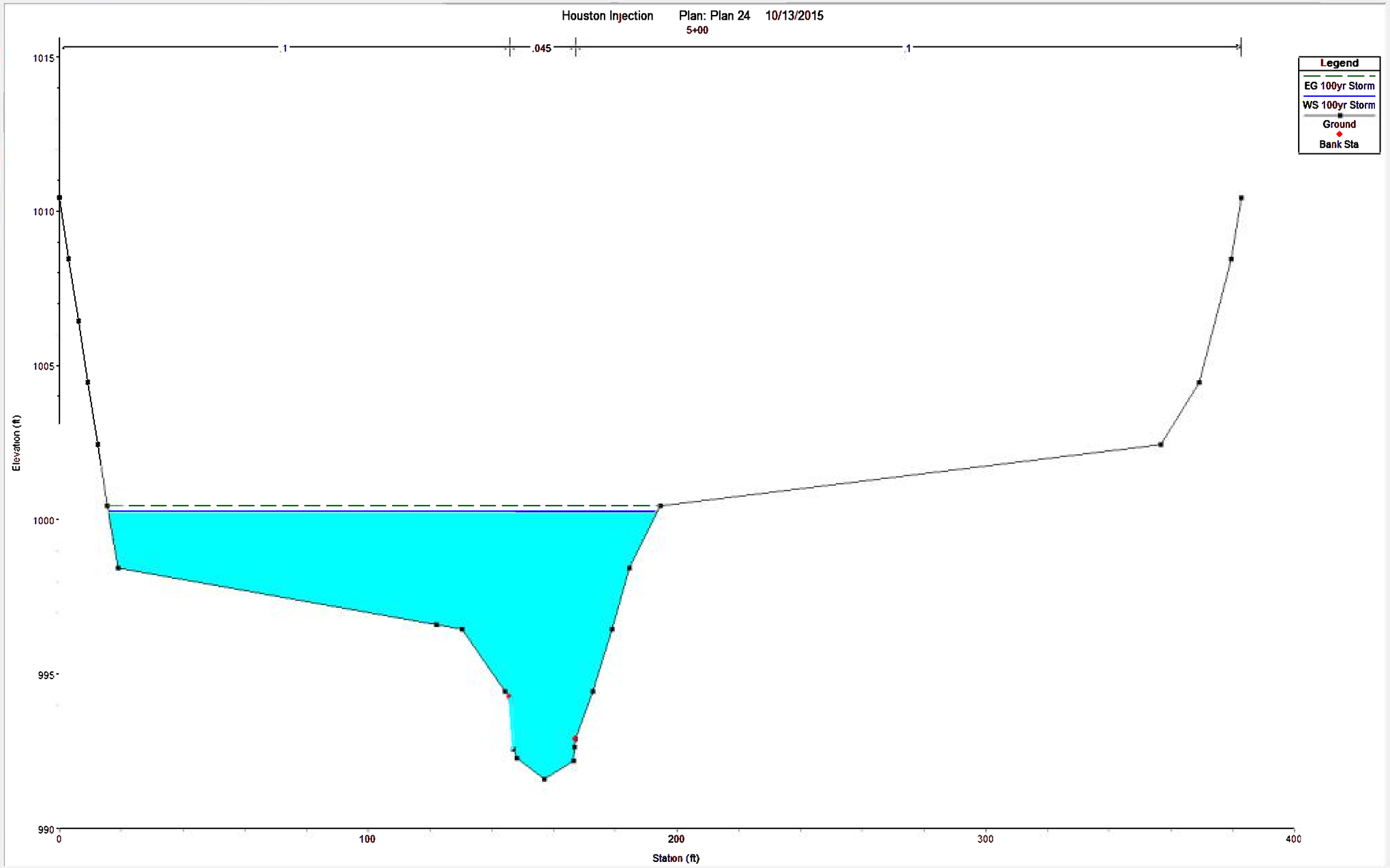
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
145.87	167.24

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:28 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.:

Description: 4+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.11	1008.45
3	6.28	1006.45
4	9.45	1004.45
5	12.61	1002.45
6	15.72	1000.45
7	19.21	998.45
8	36.98	996.45
9	41.65	996.45
10	99.21	996.45
11	153.1	993.51
12	154.68	991.6
13	154.95	991.35
14	162.85	990.47
15	169.62	991.31
16	171.8	991.69
17	173.25	994.78
18	184.83	996.45
19	193.92	998.45
20	207.07	1000.45
21	236.59	1002.45
22	250.86	1002.45
23	282.12	1002.45
24	288.86	1004.45
25	309.36	1006.45
26	317.96	1008.45
27	327.35	1010.45

Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

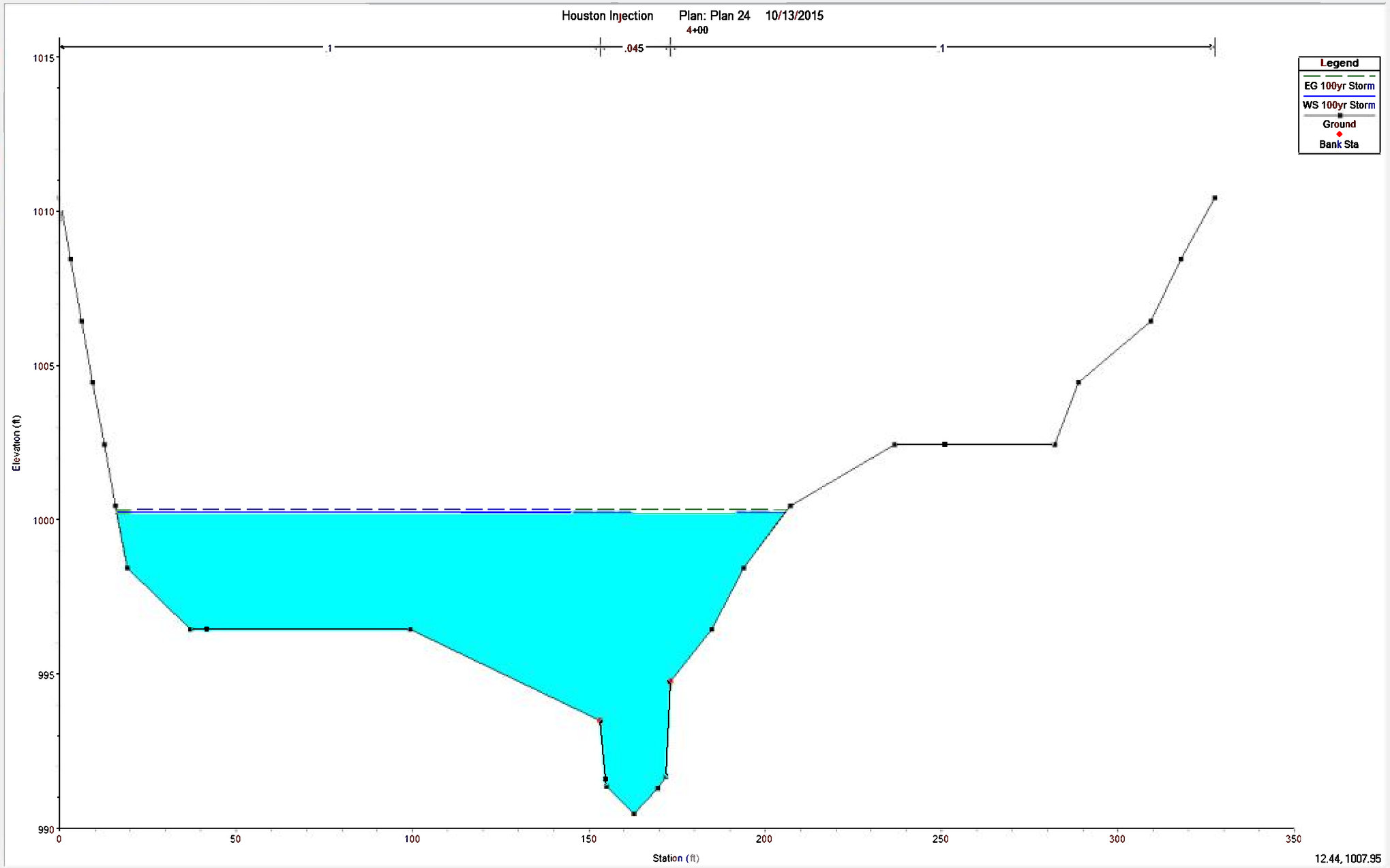
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
153.1	173.25

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:29 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: 300

Description: 3+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3	1008.45
3	6.97	1006.45
4	12.45	1004.45
5	17.34	1002.45
6	21.7	1000.45
7	25.86	998.45
8	81.48	996.45
9	131.06	996.45
10	171.03	996.45
11	181.63	994.45
12	186.94	993.61
13	188.03	991.3
14	188.87	991.47
15	196.07	990.85
16	202.62	991.23
17	203.61	991.2
18	205.07	994.1
19	216.1	996.45
20	231	998.23
21	233.34	998.45
22	318.93	1000.37
23	321.99	1000.45
24	334.41	1002.45
25	349.12	1004.45
26	360.12	1006.45
27	371.36	1008.45
28	382.06	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
25	25	25

Manning's n Values

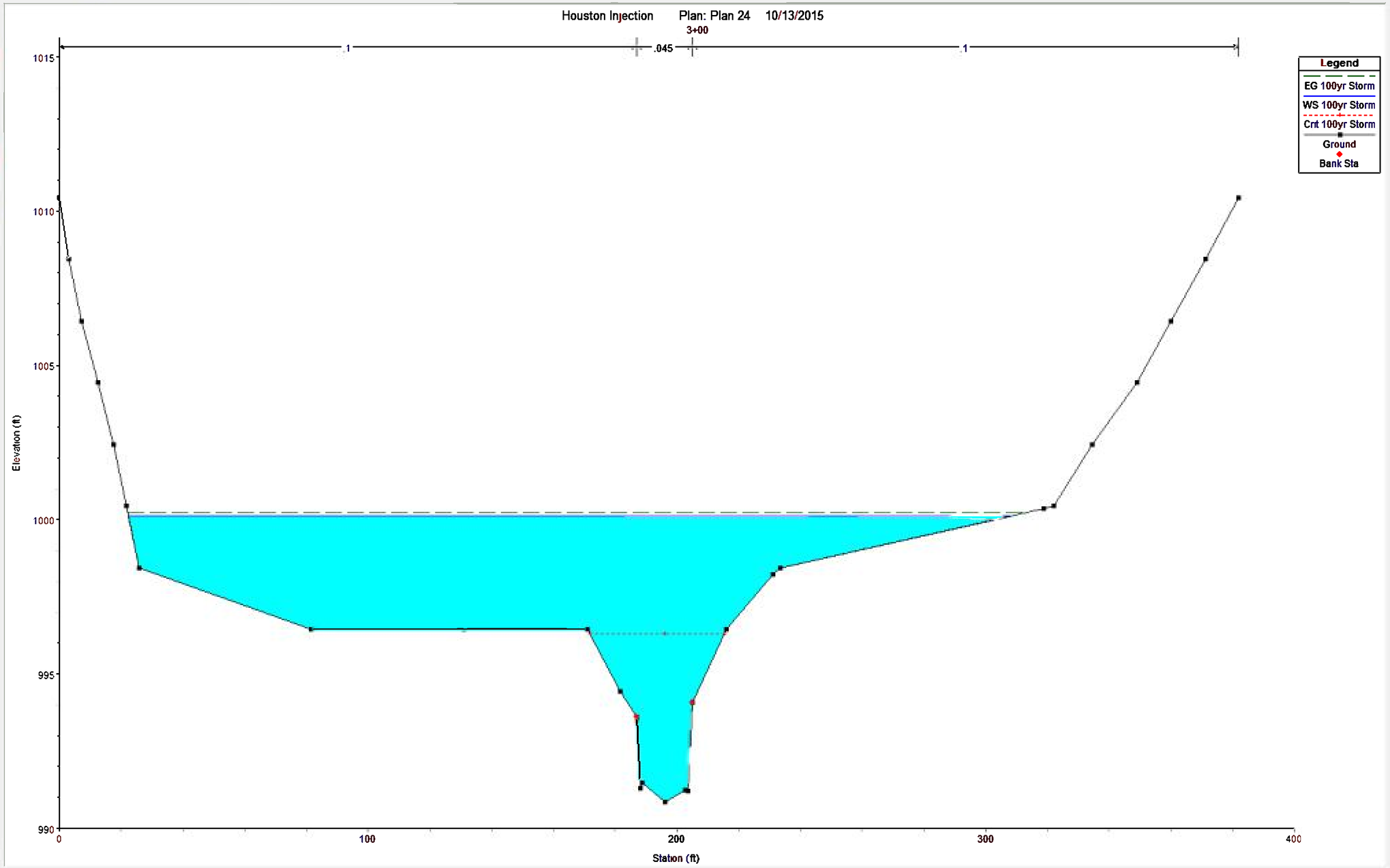
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
186.94	205.07

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:29 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: 275

Description

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3	1008.45
3	6.97	1006.45
4	12.45	1004.45
5	17.34	1002.45
6	21.7	1000.45
7	25.86	998.45
8	81.48	996.45
9	131.06	996.45
10	171.03	996.45
11	181.63	994.45
12	186.94	993.61
13	188.03	991.3
14	188.87	991.47
15	196.07	990.85
16	202.62	991.23
17	203.61	991.2
18	205.07	994.1
19	216.1	996.45
20	231	998.23
21	233.34	998.45
22	318.93	1000.37
23	321.99	1000.45
24	334.41	1002.45
25	349.12	1004.45
26	360.12	1006.45
27	371.36	1008.45
28	382.06	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
75	75	75

Manning's n Values

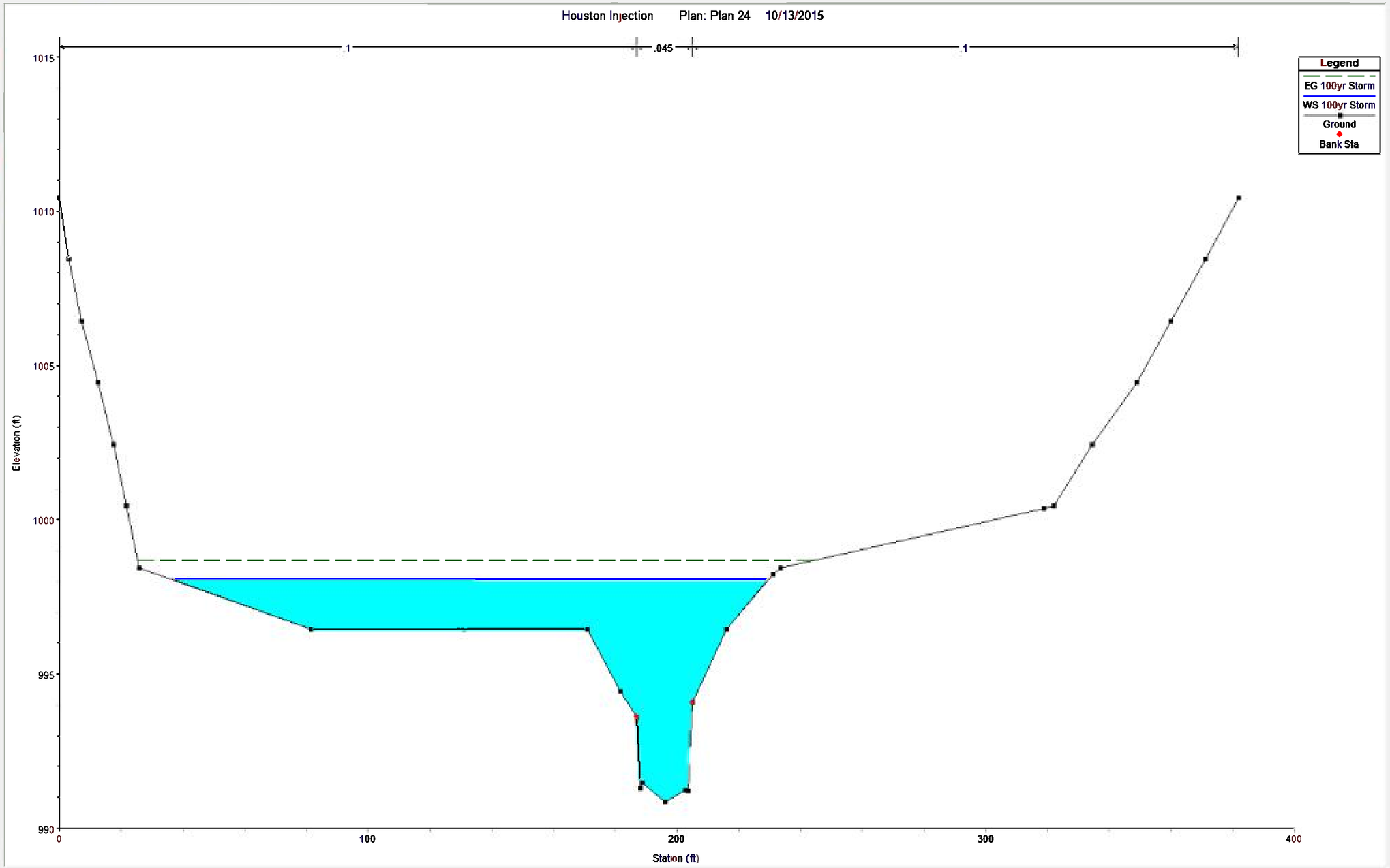
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
186.94	205.07

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:29 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: [redacted]

Description: 2+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.65	1008.45
3	6.15	1006.45
4	8.35	1004.45
5	10.72	1002.45
6	14.43	1000.45
7	18.13	998.45
8	86.3	996.45
9	114.76	994.45
10	156.3	994.45
11	184.6	994.34
12	188.13	990.61
13	189.66	990.12
14	196.34	989.62
15	202.93	990.18
16	204.23	990.52
17	207.82	994.73
18	213.02	994.45
19	269.55	996.45
20	318.58	998.45
21	393.56	1000.45
22	424.45	1002.45
23	433.17	1004.45
24	446.7	1006.45
25	459.07	1008.45
26	467.71	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

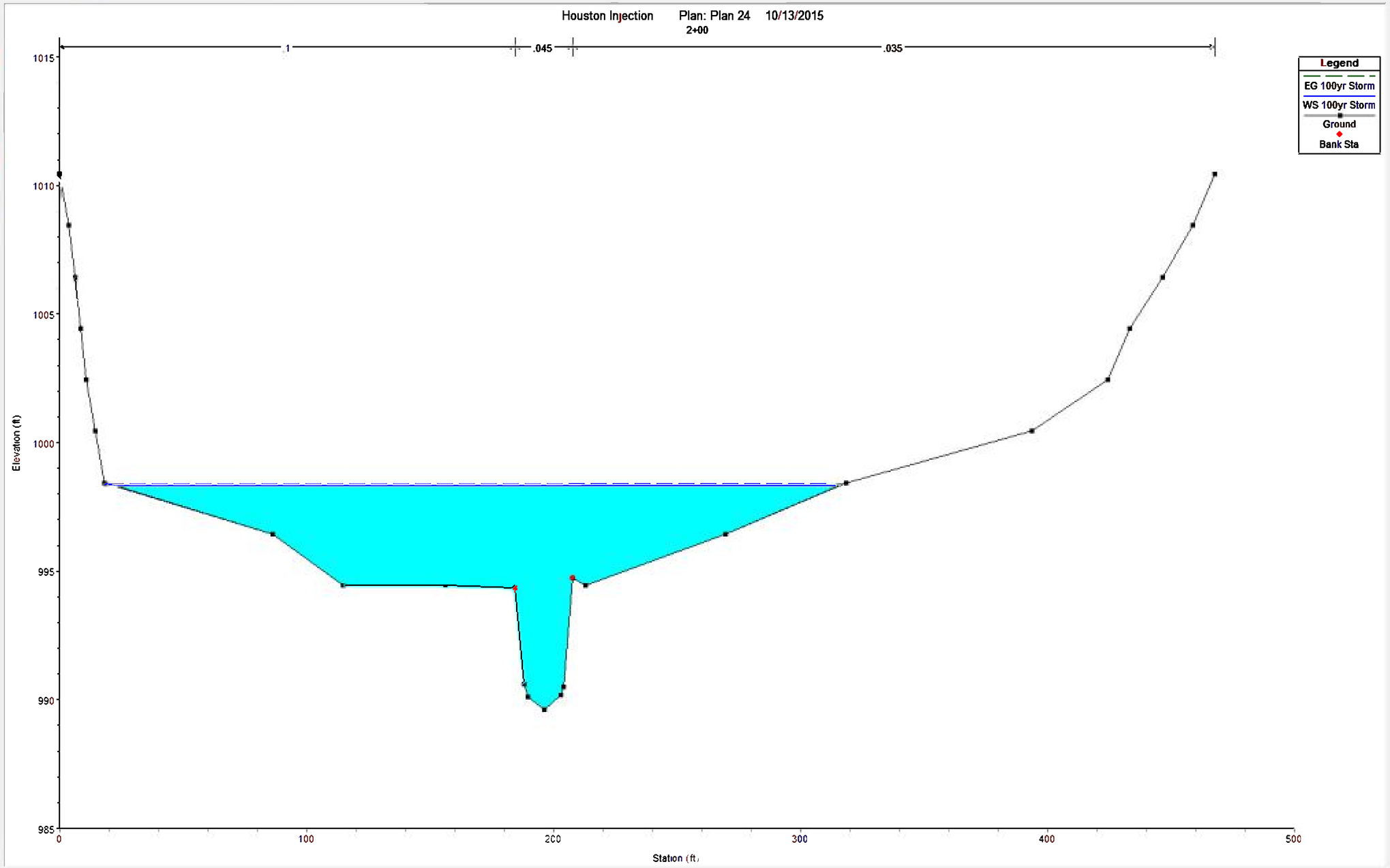
LOB	Channel	ROB
0.1	0.045	0.035

Main Channel Bank Stations

Left Bank	Right Bank
184.6	207.82

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:29 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Westland Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 3 | River Sta.: 100

Description: 1+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.34	1008.45
3	6.55	1006.45
4	9.27	1004.45
5	11.61	1002.45
6	15.5	1000.45
7	18.5	998.45
8	67.97	996.45
9	81.85	994.45
10	100.64	992.06
11	104.5	990.01
12	105.55	989.65
13	114.96	989.16
14	121.1	989.65
15	124.43	990.35
16	130.94	997.21
17	161.66	994.45
18	169.6	994.48
19	189.96	994.45
20	221.79	994
21	295.39	994.96
22	395.01	996.45
23	437.81	998.45
24	460.09	1000.45
25	463.45	1000.45
26	473.66	1000.45
27	494.19	1002.45
28	520.57	1004.45
29	527.43	1006.45
30	534.56	1008.45
31	543.23	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

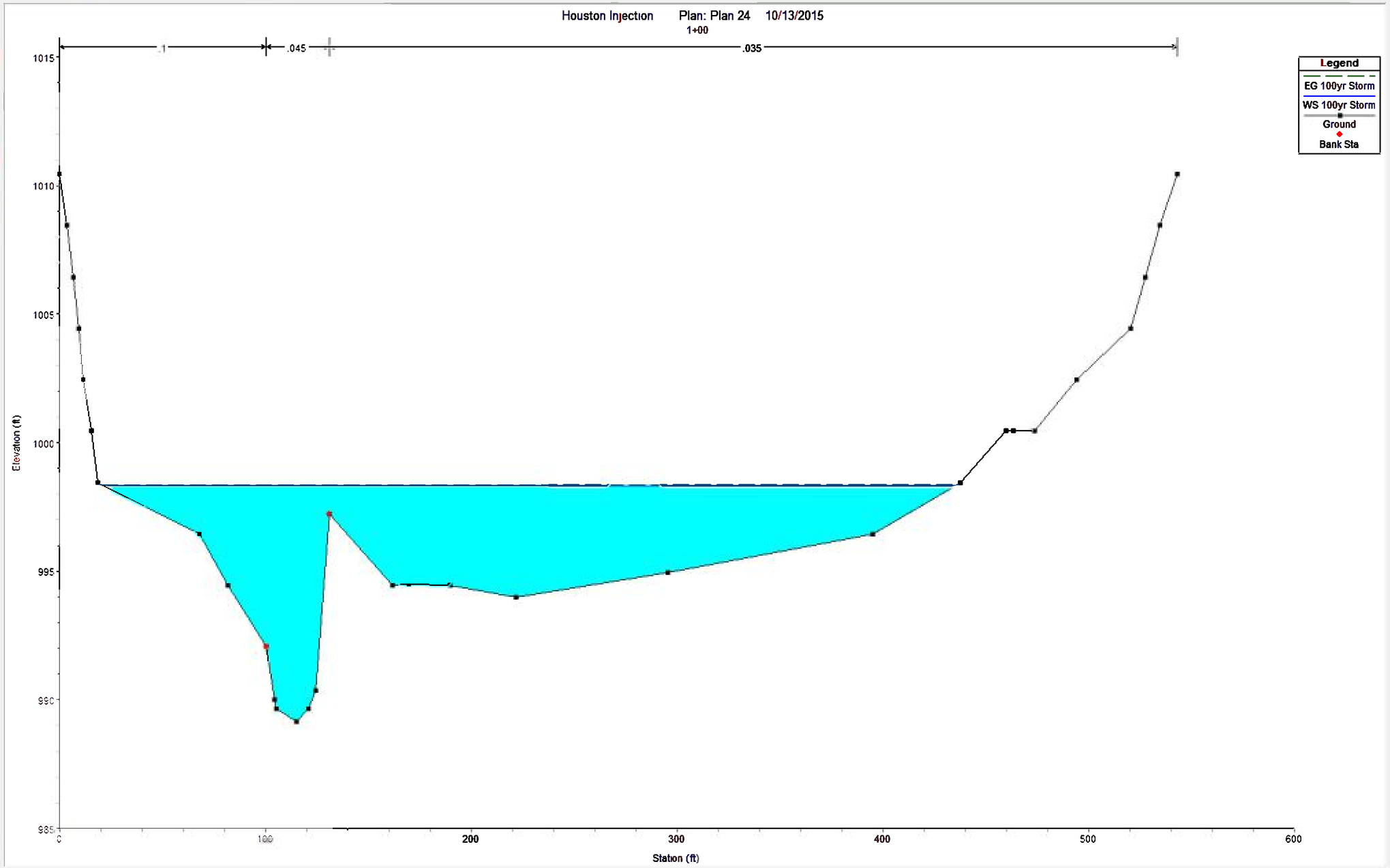
LOB	Channel	ROB
0.1	0.045	0.035

Main Channel Bank Stations

Left Bank	Right Bank
100.64	130.94

Cont\Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

9:30 AM
10/13/2015

Cross Section Data - Houston Injection X-Sections Existing R4

Exit Edit Options Plot Help

River: Westland Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 3 | River Sta.: 000

Description: 0+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	2.62	1008.45
3	5.23	1006.45
4	7.84	1004.45
5	10.47	1002.45
6	13.09	1000.45
7	30.96	998.45
8	67.11	996.45
9	89.34	994.45
10	106.61	992.51
11	110.75	989.74
12	110.96	989.64
13	126.33	988.87
14	134.71	989.63
15	136.89	992.53
16	186.09	994.45
17	193.64	994.47
18	247.36	994.45
19	320	994.45
20	354.52	994.45
21	374.47	994.6
22	379.63	994.91
23	466.64	996.45
24	500.95	996.69
25	517.8	998.45
26	551.34	1000.45
27	557.73	1001.22
28	568.93	1002.45
29	583.64	1004.45
30	597.42	1006.45
31	616.28	1008.45
32	622.68	1010.45
33	630.2	1012.45
34	645.48	1013.88
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Downstream Reach Lengths

LOB	Channel	ROB

Manning's n Values

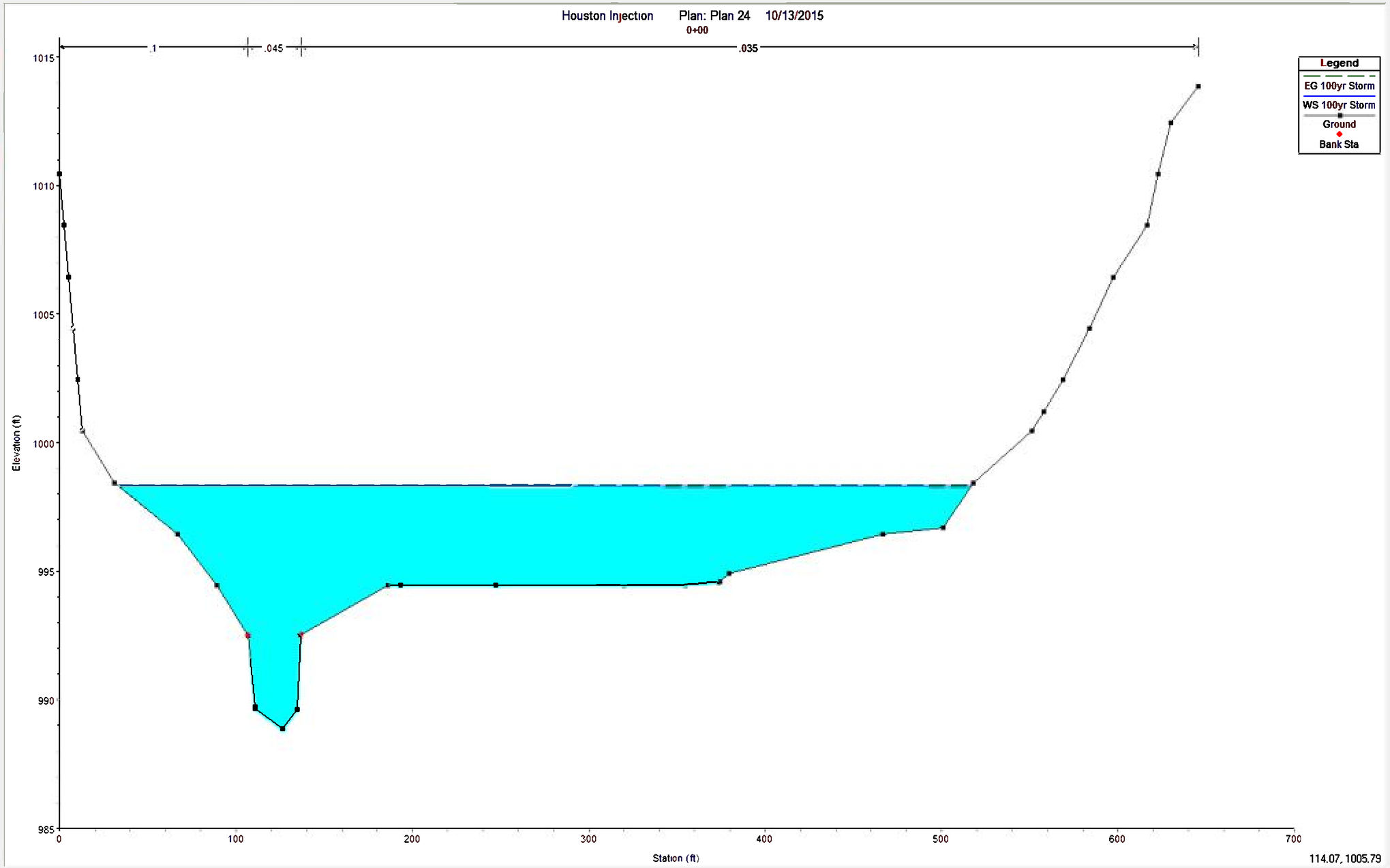
LOB	Channel	ROB
0.1	0.045	0.035

Main Channel Bank Stations

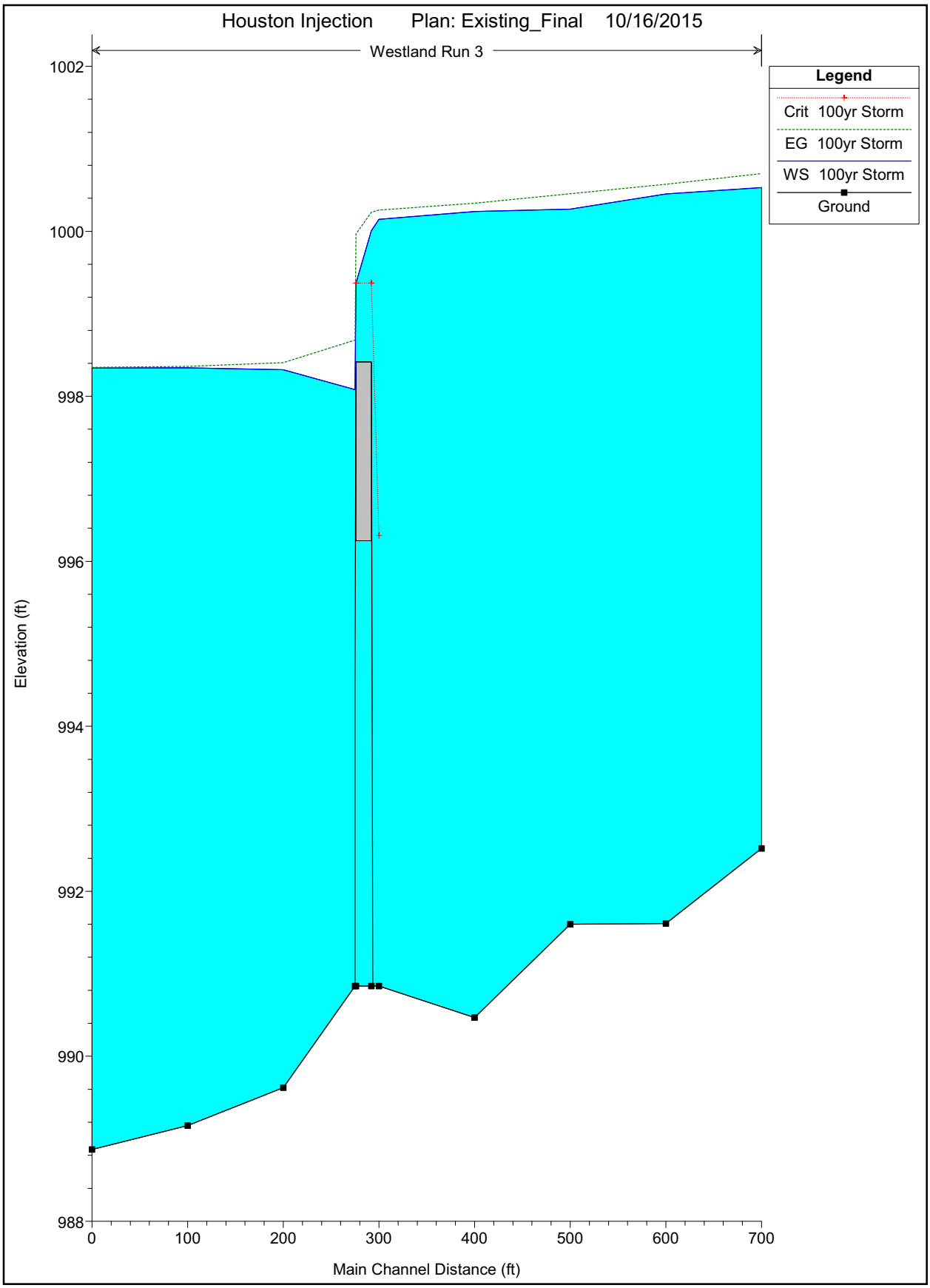
Left Bank	Right Bank
106.61	136.89

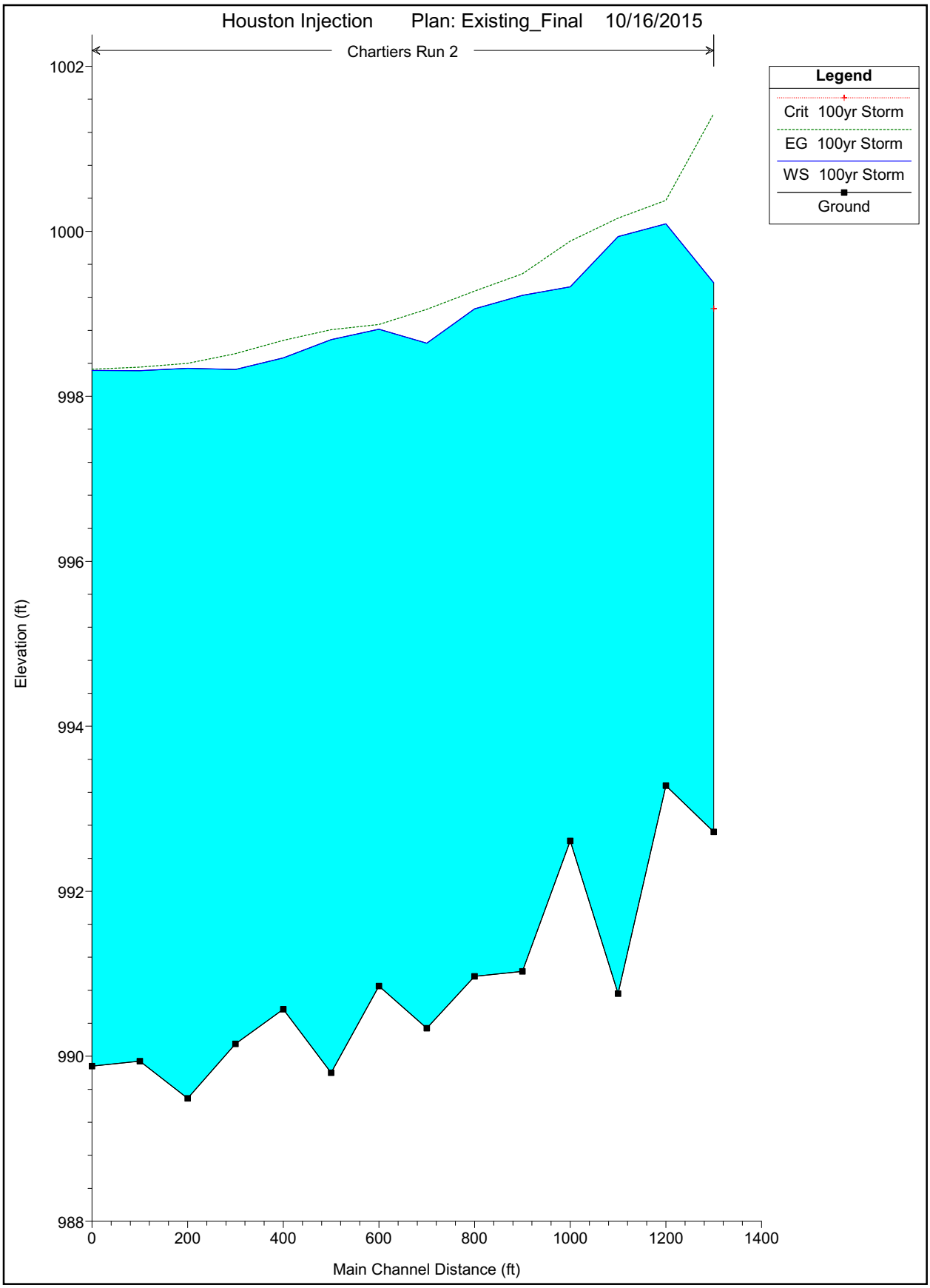
Cont\Exp Coefficient (Steady Flow)

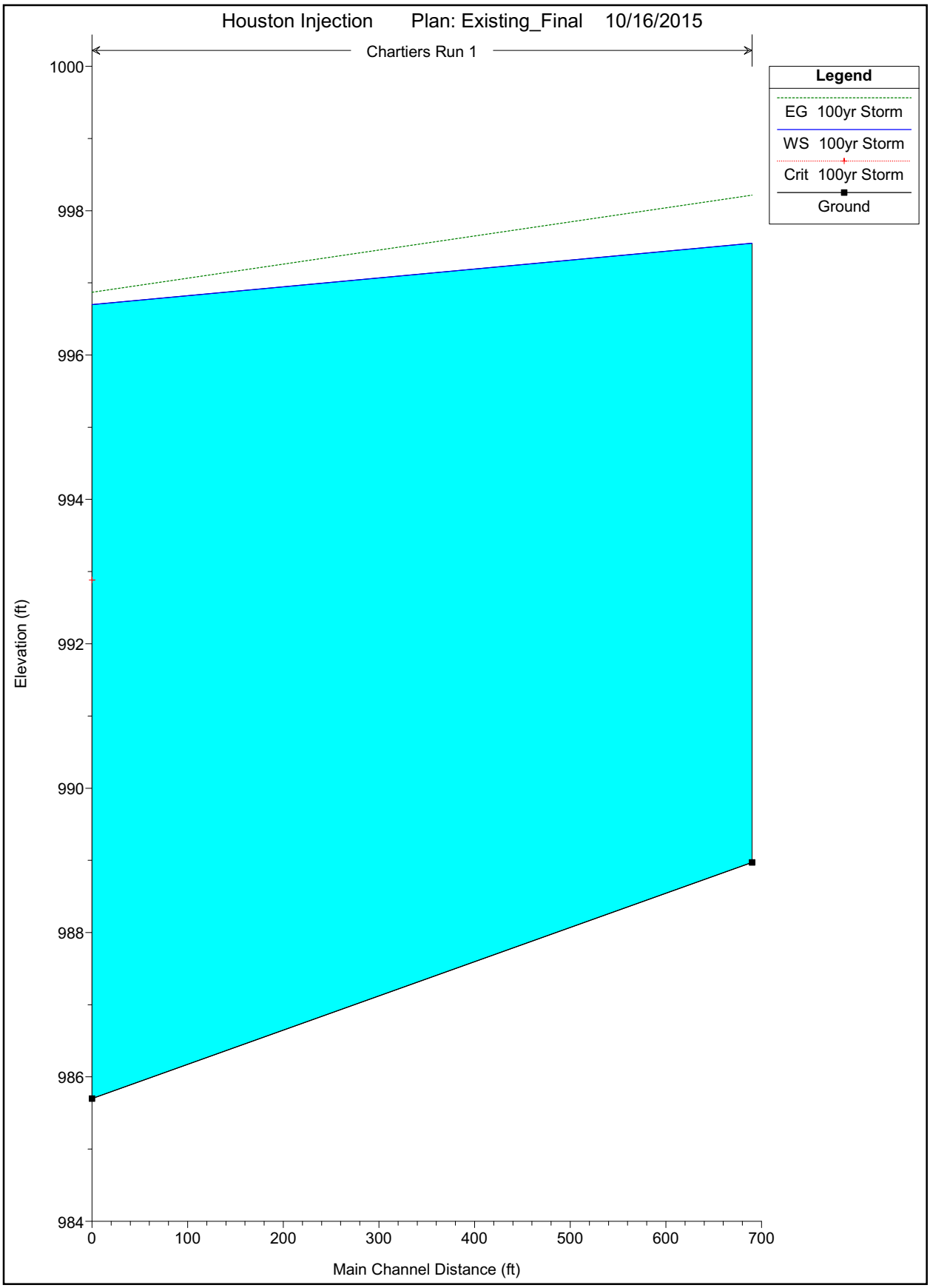
Contraction	Expansion
0.1	0.3



Select river station for cross section editing.


Houston Injection Plan: Existing_Final 10/16/2015
Westland Run 3
Legend
Crit 100yr Storm
EG 100yr Storm
WS 100yr Storm
Ground
Elevation (ft)
1002
1000
998
996
994
992
990
988
0
100
200
300
400
500
600
700
Main Channel Distance (ft)


Houston Injection Plan: Existing_Final 10/16/2015
Chartiers Run 2
Legend
Crit 100yr Storm
EG 100yr Storm
WS 100yr Storm
Ground
Elevation (ft)
1002
1000
998
996
994
992
990
988
0
200
400
600
800
1000
1200
1400
Main Channel Distance (ft)


Houston Injection Plan: Existing_Final 10/16/2015
Chartiers Run 1
Legend
EG 100yr Storm
WS 100yr Storm
Crit 100yr Storm
Ground
Elevation (ft)
1000
998
996
994
992
990
988
986
984
0
100
200
300
400
500
600
700
Main Channel Distance (ft)

C-2 HEC-RAS PROPOSED CONDITIONS MODEL DATA

HoustonInjection.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
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X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
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****

PROJECT DATA
Project Title: Houston Injection
Project File : HoustonInjection.prj
Run Date and Time: 1/17/2017 1:38:31 PM

Project in English units

****

PLAN DATA

Plan Title: Plan 36
Plan File : C:\Users\lydia.karlheim\Desktop\Houston Injection HEC-RAS_011617\HoustonInjection.p36

Geometry Title: Houston Injection X-Sections Proposed R6
Geometry File : C:\Users\lydia.karlheim\Desktop\Houston Injection HEC-RAS_011617\HoustonInjection.g12

Flow Title : 100yr Storm R4
Flow File : C:\Users\lydia.karlheim\Desktop\Houston Injection HEC-RAS_011617\HoustonInjection.f04

Plan Summary Information:

Number of:	Cross Sections	= 25	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 1	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: 100yr Storm R4
Flow File : C:\Users\lydia.karlheim\Desktop\Houston Injection HEC-RAS_011617\HoustonInjection.f04

Flow Data (cfs)

River	Reach	RS	100yr Storm
Chartiers Run	2	1300	1666.75
Chartiers Run	1	690	2950
Westland Run	3	700	1283.25

Boundary Conditions

River	Reach	Profile	Upstream
Chartiers Run	2	100yr Storm	Normal S = 0.006588
Chartiers Run	1	100yr Storm	Known WS = 996.7
Westland Run	3	100yr Storm	Normal S = 0.001774

GEOMETRY DATA

Geometry Title: Houston Injection X-Sections Proposed R6
Geometry File : C:\Users\lydia.karlheim\Desktop\Houston Injection HEC-RAS_011617\HoustonInjection.g12

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Chartiers Run	2		1
Chartiers Run	1	1	
Westland Run	3		1

JUNCTION INFORMATION

Name: 1
Description: Junction 1
Energy computation Method

Length across Junction River	Reach		Tributary River	Reach	Length	Angle
Chartiers Run	2	to Chartiers Run	1		100	
Westland Run	3	to Chartiers Run	1		170	

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 1300

INPUT
Description: 13+00
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1022	11.07	1020	20.94	1018	31.74	1016	49.99	1014
61.77	1012	97.91	1010	114.36	1008	125.87	1006	150.8	1004
164.76	1003.7	209.44	1002	220.48	1000	241.86	999.64	248.2	994.3
248.83	994.03	257.48	992.72	266.49	994.07	269.08	994.26	273.78	1002.86
310.1	1004	365.51	1004	382.39	1004	468.73	1006	483.56	1008
492.69	1010	501.23	1012	505.96	1014	510.6	1016	516.34	1018
522.21	1020								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	241.86	.045	273.78	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
241.86	273.78	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 1200

INPUT
Description: 12+00
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1022	6.34	1020	12.32	1018	18.56	1016	24.82	1014
34.91	1012	47.96	1010	74.92	1008	114.68	1006	133.11	1004
179.65	1002	263.05	999	325.95	995	328.64	994.32	330.02	993.89
335.85	993.28	342.23	993.95	344.59	994.23	347.57	995.41	526.28	1008
539.84	1010	550.59	1012	559.5	1014	568.23	1016	576.34	1018
583.58	1020								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	325.95	.045	347.57	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
325.95	347.57	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 1100

INPUT
Description: 11+00
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1020	5.56	1018	11.69	1016	17.69	1014	23.49	1012
32.37	1010	57	1008	90.4	1006	102.86	1004	141.39	1002
252.85	1000	324.8	998.7	376.75	997	407.3	995.87	410.28	993.33
410.45	993.34	424.95	990.76	435.44	993.29	436.12	993.53	441.29	999.99

```
  481.01    1008  541.23    1010  557.62    1012  570.21    1014  577.45    1016
  584.32    1018  591.16    1020

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .035   407.3    .045  441.29      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         407.3  441.29              100     100     100             .1       .3

CROSS SECTION


RIVER: Chartiers Run
REACH: 2                  RS: 1000

INPUT
Description: 10+00
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0    1018    4.56    1016   10.03    1014   16.12    1012   24.25    1010
   68.33    1008   85.19    1006   104.4    1004   164.4    1002  258.05    1000
  410.45  997.45  412.99   993.5  413.63  993.25  424.72   993.2   444.4  992.71
  444.68  992.61   444.8  995.57  463.16    1002  488.84    1002  493.82    1004
  502.09    1006  513.73    1008   523.1    1010  529.27    1012  538.81    1014

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .035  410.45    .045   444.8      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        410.45   444.8              100     100     100             .1       .3

CROSS SECTION


RIVER: Chartiers Run
REACH: 2                  RS: 900

INPUT
Description: 9+00
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0    1018    5.23    1016   10.73    1014    17.6    1012   32.87    1010
   63.06 1009.01   98.76    1008  125.63    1006  219.27    1004  260.04    1002
  318.57    1000  386.21     998  449.32  996.78  455.58  992.73  456.44  992.36
  463.97  991.03  472.18  992.35  472.73  992.49     474   993.9  542.58     997
   561.7    1000  566.33    1002  570.19    1004  574.97    1006  581.02    1008
  587.22    1010   593.8    1012  600.84    1014

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .035  449.32    .045     474      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        449.32     474              100     100     100             .1       .3

CROSS SECTION
```

RIVER: Chartiers Run
REACH: 2 RS: 800

INPUT
Description: 8+00
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1020	19.45	1018	26.39	1016	31.97	1014	37.47	1012
48.15	1010	129.59	1008	168.44	1006	245.01	1004	291.83	1002
340.73	1000	426.05	998	496.92	996	504.12	996.79	508.56	992.47
509.61	991.92	517.95	990.97	526.71	991.92	530.58	992.42	532.68	993.34
540.9	994	578.32	996	584.86	998	589.05	1000	593.45	1002
599.36	1002.6	620.86	1004	632.98	1006	638.18	1008	640.47	1010
642.81	1012								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	504.12	.045	532.68	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
504.12	532.68	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 700

INPUT
Description: 7+00
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1018	8.32	1016	31.4	1014	48.64	1012	65.7	1010
115.56	1008	130.19	1006	214.37	1004	269.16	1002	304.44	1000.89
335.41	1000	456.48	998	518.32	998	542.34	998	547.32	994
567.4	993.59	569.75	991.78	570.79	991.23	583.23	990.34	594.92	991.58
595.26	991.83	595.92	994.75	611.69	1013	614.49	1014		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	567.4	.045	595.92	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
567.4	595.92	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 600

INPUT
Description: 6+00
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1018	8.28	1016	17.93	1014	24.97	1012	64.42	1010

109.73	1008	134.72	1006	209.95	1004	262.21	1002	285.57	1001.19
328.45	1000	414.43	997	594.77	993.07	596.71	992.38	596.94	991.44
604.59	990.85	612.65	991.44	613.49	991.63	614.48	992.64	644.96	1007
649.16	1010								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	594.77	.045	614.48	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
594.77	614.48	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 500

INPUT
Description: 5+00
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1018	7.61	1016	14.82	1014	28.12	1012	77.14	1010
105.48	1008	169.46	1006	204.58	1004	246.73	1002	265.12	1001.15
289.81	1000	393.16	998	556.64	994.5	574.81	993.73	577.67	991.19
578.9	990.88	585.96	989.8	592.87	991.16	593.94	991.28	594.81	992.76
619.22	1017	626.63	1020						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	574.81	.045	594.81	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
574.81	594.81	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 400

INPUT
Description: 4+00
4+00
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1020	8.4	1018	16.74	1016	30.8	1014	87.62	1012
94.14	1010	112.83	1008	180.85	1006	197.47	1004	214.14	1002
268.8	1000	324.88	998.5293	332.79	996.4737	352.86	996.56	390.23	997.06
521.56	996	536.02	994.67	539.35	991.14	540.71	990.65	547.75	990.57
554.17	990.7	559.04	991.62	561.11	995.02	577.68	1007	599.84	1010
605.13	1012								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	536.02	.045	561.11	.1

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

536.02	561.11		100	100	100		.1	.3	

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 300

INPUT
Description: 3+00
3+00
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1016	13.91	1014	69.69	1012	108.77	1010	117.37	1008
151.47	1006	154.28	1005.17	176.22	1003.8	213.5	1001.41	247.56	1000.28
281.48	999.14	317.23	998.05	352.99	997.46	359.31	995.4672	421.22	995.81
497.59	996	506.88	995.33	509.96	990.82	510.96	990.36	517.04	990.15
522.36	990.36	530.74	991.22	533.86	993.31	543.96	996	554.93	998
558.65	1000	561.82	1002	564.69	1004	567.54	1006	570.49	1008
574.04	1010	578.12	1012						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	506.88	.045	533.86	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
506.88	533.86	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 200

INPUT
Description: 2+00
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1016	34.24	1014	54.23	1012	88.6	1010	105.26	1008
110.95	1006	134.75	1004	155.42	1002.4	163.09	1002.05	200.06	1000.43
234.34	999.48	267.77	998.38	301.14	997.53	340.5	996.86	370.78	994.4543
441.46	995.02	503.4	994	512.46	993.6	516.73	990.33	517.06	990.2
524.95	989.49	531.11	990.03	531.36	990.1	532.92	992.04	553.69	994
559.79	998	564.6	1000	568.47	1002	571.85	1004	575.03	1006
578.47	1008	581.57	1010						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	512.46	.045	532.92	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
512.46	532.92	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 100

INPUT
Description: 1+00
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1016	18.49	1014	33	1012	57.1	1010	95.37	1008
101.51	1006	105.78	1004	121.71	1002	153.3	1000	156.48	999.9
181.48	998.88	216.34	998.65	251.28	997.64	292.32	994.97	332.22	994.44
456.12	994.2	530.11	993.13	531.92	990.21	532.37	990.09	541.57	989.94
550.34	990.46	550.61	990.82	588.39	998	596.38	1000	599.1	1002
601.43	1004	603.89	1006	606.39	1008	609.02	1010		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	530.11	.045	550.61	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
530.11	550.61	100	100	100	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 2 RS: 000

INPUT
Description: 0+00
0+00
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1016	38.1	1014	49.42	1012	58.9	1010	78.48	1008
110.64	1006	116.83	1004	123.89	1002	144.04	1000	168.76	998
171.2	997.18	199.55	997.13	234.47	995.71	275.65	995.12	317.06	994.56
368.67	994.07	405.94	993.92	581.95	994	593.22	990.81	594.99	990.31
595.58	990.32	604.62	989.88	612.46	990.26	613.01	990.33	615.31	990.86
648.51	996	655.74	998	666.41	1000	688.85	1002	697.85	1004
702.06	1006	705.65	1008	708.85	1010	711.9	1012		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	593.22	.045	615.31	.1

Bank Sta: Left	Right	Coeff Contr.	Expan.
593.22	615.31	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 1 RS: 690

INPUT
Description: O
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3.834	1008.45	7.558	1006.45	12.239	1004.45	47.435	1002.45
51.871	1000.45	58.454	998.45	72.214	996.45	109.854	994.45	128.396	992.45
147.977	990.45	159.696	990.45	161.791	992.45	175.445	992.45	179.32	992.089
179.321	992.089	180.955	988.976	181.24	988.965	190.122	989.095	200.046	989.75

205.477 991.618 206.483 992.45 210.978 994.45 215.831 996.45 225.482 998.45
235.577 1000.45 249.658 1002.45 327.388 1003.59 419.755 1004.45 422.291 1006.45
424.189 1008.45 425.672 1010.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	179.32	.045	205.477	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
179.32	205.477	690	690	.1	.3

CROSS SECTION

RIVER: Chartiers Run
REACH: 1 RS: 000

INPUT
Description: N
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1715	1006.3	1725	1000.4	1773	1000.4	1782	1001.8	1793	1001.8
1808	1001.4	1832	999.9	1850	993.4	1866	993.3	1901	992.3
1970	990.6	1987	986.7	1997	986.2	2000	985.9	2005	985.7
2006	986.2	2013	990.8	2038	990.3	2084	991.9	2098	998.9
2145	999.3	2222	1007						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1715	.1	1970	.045	2013	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1970	2013	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 700

INPUT
Description: 7+00
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	19.55	1008.45	32.84	1006.45	45.16	1004.45	60.48	1002.45
83.63	1000.45	105	998.45	199.77	996.45	215.09	995.25	216.25	993.4
216.84	992.88	221.96	992.52	226.8	992.87	234.82	992.86	239.2	996.42
241.34	996.45	244.65	998.45	271.7	998.45	295.52	998.45	303.77	1000.45
335.24	1001.1	401.57	1002.45	429.04	1004.45	434.97	1006.45	437.76	1008.45
440.58	1010.45	443.43	1012.45	445.83	1014.45	448.43	1016.45	451.05	1018.45
453.67	1020.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	215.09	.045	239.2	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
215.09	239.2	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 600

INPUT
Description: 6+00
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	2.65	1008.45	5.6	1006.45	9.02	1004.45	12.9	1002.45
17.22	1000.45	24.53	998.45	98.22	996.45	102.18	994.45	108.86	995.33
111.12	992.92	112.83	992.29	116.79	991.61	120.05	992.21	122.46	992.44
126.95	992.92	134.4	994.45	151.84	996.45	161.39	998.45	188.75	998.45
232.09	996.45	239.86	996.45	252.57	998.45	260.19	1000.45	329.76	1002.45
366.35	1004.45	376.68	1006.45	386.51	1008.45	392.81	1010.45	396.78	1012.45
400.8	1014.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	108.86	.045	126.95	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
108.86	126.95	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 500

INPUT
Description: 5+00
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3.08	1008.45	6.16	1006.45	9.23	1004.45	12.31	1002.45
15.44	1000.45	19.05	998.45	122.08	996.6	130.35	996.45	144.22	994.45
145.87	994.28	146.95	992.58	148.02	992.28	157.18	991.6	166.49	992.18
166.94	992.63	167.24	992.91	172.62	994.45	178.98	996.45	184.49	998.45
194.71	1000.45	356.68	1002.45	369.21	1004.45	379.49	1008.45	382.9	1010.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	145.87	.045	167.24	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
145.87	167.24	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 400

INPUT
Description: 4+00
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
*****************************************************************************
       0 1010.45    3.11 1008.45    6.28 1006.45    9.45 1004.45   12.61 1002.45
   15.72 1000.45   19.21  998.45   36.98  996.45   41.65  996.45   99.21  996.45
   153.1  993.51  154.68   991.6  154.95  991.35  162.85  990.47  169.62  991.31
   171.8  991.69  173.25  994.78  184.83  996.45  193.92  998.45  207.07 1000.45
  236.59 1002.45  250.86 1002.45  282.12 1002.45  288.86 1004.45  309.36 1006.45
  317.96 1008.45  327.35 1010.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0      .1   153.1    .045  173.25      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         153.1  173.25              100     100     100             .1       .3

CROSS SECTION


RIVER: Westland Run
REACH: 3                  RS: 300

INPUT
Description: 3+00
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
       0 1010.45       3 1008.45    6.97 1006.45   12.45 1004.45   17.34 1002.45
    21.7 1000.45   25.86  998.45   81.48  996.45  131.06  996.45  171.03  996.45
  181.63  994.45  186.94  993.61  188.03   991.3  188.87  991.47  196.07  990.85
  202.62  991.23  203.61   991.2  205.07   994.1   216.1  996.45     231  998.23
  233.34  998.45  318.93 1000.37  321.99 1000.45  334.41 1002.45  349.12 1004.45
  360.12 1006.45  371.36 1008.45  382.06 1010.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0      .1  186.94    .045  205.07      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        186.94  205.07                25      25      25             .1       .3

BRIDGE


RIVER: Westland Run
REACH: 3                  RS: 292

INPUT
Description:
Distance from Upstream XS =       8
Deck/Roadway Width        =      16
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      28
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*****************************************************************************
       0 998.416 996.249       3 998.416 996.249    6.97 998.416 996.249
   12.45 998.416 996.249   17.34 998.416 996.249    21.7 998.416 996.249
   25.86 998.416 996.249   81.48 998.416 996.249  131.06 998.416 996.249
  171.03 998.416 996.249  181.63 998.416 996.249  186.94 998.416 996.249
  188.03 998.416 996.249  188.87 998.416 996.249  196.07 998.416 996.249
  202.62 998.416 996.249  203.61 998.416 996.249  205.07 998.416 996.249
```

```
   216.1 998.416 996.249     231 998.416 996.249  233.34 998.416 996.249
  318.93 998.416 996.249  321.99 998.416 996.249  334.41 998.416 996.249
  349.12 998.416 996.249  360.12 998.416 996.249  371.36 998.416 996.249
  382.06 998.416 996.249

Upstream Bridge Cross Section Data
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
       0 1010.45       3 1008.45    6.97 1006.45   12.45 1004.45   17.34 1002.45
    21.7 1000.45   25.86  998.45   81.48  996.45  131.06  996.45  171.03  996.45
  181.63  994.45  186.94  993.61  188.03   991.3  188.87  991.47  196.07  990.85
  202.62  991.23  203.61   991.2  205.07   994.1   216.1  996.45     231  998.23
  233.34  998.45  318.93 1000.37  321.99 1000.45  334.41 1002.45  349.12 1004.45
  360.12 1006.45  371.36 1008.45  382.06 1010.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0      .1  186.94    .045  205.07      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        186.94  205.07             .1       .3

Downstream  Deck/Roadway Coordinates
    num=      28
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**********************************************************************
       0 998.416 996.249       3 998.416 996.249    6.97 998.416 996.249
   12.45 998.416 996.249   17.34 998.416 996.249    21.7 998.416 996.249
   25.86 998.416 996.249   81.48 998.416 996.249  131.06 998.416 996.249
  171.03 998.416 996.249  181.63 998.416 996.249  186.94 998.416 996.249
  188.03 998.416 996.249  188.87 998.416 996.249  196.07 998.416 996.249
  202.62 998.416 996.249  203.61 998.416 996.249  205.07 998.416 996.249
   216.1 998.416 996.249     231 998.416 996.249  233.34 998.416 996.249
  318.93 998.416 996.249  321.99 998.416 996.249  334.41 998.416 996.249
  349.12 998.416 996.249  360.12 998.416 996.249  371.36 998.416 996.249
  382.06 998.416 996.249

Downstream Bridge Cross Section Data
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
       0 1010.45       3 1008.45    6.97 1006.45   12.45 1004.45   17.34 1002.45
    21.7 1000.45   25.86  998.45   81.48  996.45  131.06  996.45  171.03  996.45
  181.63  994.45  186.94  993.61  188.03   991.3  188.87  991.47  196.07  990.85
  202.62  991.23  203.61   991.2  205.07   994.1   216.1  996.45     231  998.23
  233.34  998.45  318.93 1000.37  321.99 1000.45  334.41 1002.45  349.12 1004.45
  360.12 1006.45  371.36 1008.45  382.06 1010.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0      .1  186.94    .045  205.07      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        186.94  205.07             .1       .3

Upstream Embankment side slope              =    .212 horiz. to 1.0 vertical
Downstream Embankment side slope            =    .258 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
```

Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 275

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3	1008.45	6.97	1006.45	12.45	1004.45	17.34	1002.45
21.7	1000.45	25.86	998.45	81.48	996.45	131.06	996.45	171.03	996.45
181.63	994.45	186.94	993.61	188.03	991.3	188.87	991.47	196.07	990.85
202.62	991.23	203.61	991.2	205.07	994.1	216.1	996.45	231	998.23
233.34	998.45	318.93	1000.37	321.99	1000.45	334.41	1002.45	349.12	1004.45
360.12	1006.45	371.36	1008.45	382.06	1010.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	186.94	.045	205.07	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
186.94	205.07	75	75	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 200

INPUT
Description: 2+00
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3.65	1008.45	6.15	1006.45	8.35	1004.45	10.72	1002.45
14.43	1000.45	18.13	998.45	86.3	996.45	114.76	994.45	156.3	994.45
184.6	994.34	188.13	990.61	189.66	990.12	196.34	989.62	202.93	990.18
204.23	990.52	207.82	994.73	213.02	994.45	269.55	996.45	318.58	998.45
393.56	1000.45	424.45	1002.45	433.17	1004.45	446.7	1006.45	459.07	1008.45
467.71	1010.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	184.6	.045	207.82	.035

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
184.6	207.82	100	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 100

INPUT
Description: 1+00
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	3.34	1008.45	6.55	1006.45	9.27	1004.45	11.61	1002.45
15.5	1000.45	18.5	998.45	67.97	996.45	81.85	994.45	100.64	992.06
104.5	990.01	105.55	989.65	114.96	989.16	121.1	989.65	124.43	990.35
130.94	997.21	161.66	994.45	169.6	994.48	189.96	994.45	221.79	994
295.39	994.96	395.01	996.45	437.81	998.45	460.09	1000.45	463.45	1000.45
473.66	1000.45	494.19	1002.45	520.57	1004.45	527.43	1006.45	534.56	1008.45
543.23	1010.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	100.64	.045	130.94	.035

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
100.64	130.94	100	100	100	.1	.3

CROSS SECTION

RIVER: Westland Run
REACH: 3 RS: 000

INPUT
Description: 0+00
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1010.45	2.62	1008.45	5.23	1006.45	7.84	1004.45	10.47	1002.45
13.09	1000.45	30.96	998.45	67.11	996.45	89.34	994.45	106.61	992.51
110.75	989.74	110.96	989.64	126.33	988.87	134.71	989.63	136.89	992.53
186.09	994.45	193.64	994.47	247.36	994.45	320	994.45	354.52	994.45
374.47	994.6	427.76	995.27	468.24	995.82	500.95	996.69	517.8	998.45
551.34	1000.45	557.73	1001.22	568.93	1002.45	583.64	1004.45	597.42	1006.45
616.28	1008.45	622.68	1010.45	630.2	1012.45	645.48	1013.88		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	106.61	.045	136.89	.035

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff Contr.	Expan.
106.61	136.89	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Chartiers Run

Reach	River Sta.	n1	n2	n3
2	1300	.1	.045	.1
2	1200	.035	.045	.1
2	1100	.035	.045	.1
2	1000	.035	.045	.1
2	900	.035	.045	.1
2	800	.035	.045	.1
2	700	.035	.045	.1
2	600	.035	.045	.1
2	500	.035	.045	.1
2	400	.035	.045	.1
2	300	.035	.045	.1
2	200	.035	.045	.1
2	100	.035	.045	.1
2	000	.035	.045	.1
1	690	.1	.045	.1
1	000	.1	.045	.1

River:Westland Run

Reach	River Sta.	n1	n2	n3
3	700	.1	.045	.1
3	600	.1	.045	.1
3	500	.1	.045	.1
3	400	.1	.045	.1
3	300	.1	.045	.1
3	292	Bridge		
3	275	.1	.045	.1
3	200	.1	.045	.035
3	100	.1	.045	.035
3	000	.1	.045	.035

SUMMARY OF REACH LENGTHS

River: Chartiers Run

Reach	River Sta.	Left	Channel	Right
2	1300	100	100	100
2	1200	100	100	100
2	1100	100	100	100
2	1000	100	100	100
2	900	100	100	100
2	800	100	100	100
2	700	100	100	100
2	600	100	100	100
2	500	100	100	100
2	400	100	100	100
2	300	100	100	100
2	200	100	100	100
2	100	100	100	100
2	000			

*1	*	690	*	690*	690*	690*
*1	*	000	*	100*	100*	100*

River: Westland Run

Reach	River Sta.	Left	Channel	Right
*3	* 700	* 100*	100*	100*
*3	* 600	* 100*	100*	100*
*3	* 500	* 100*	100*	100*
*3	* 400	* 100*	100*	100*
*3	* 300	* 25*	25*	25*
*3	* 292	*Bridge	*	*	*
*3	* 275	* 75*	75*	75*
*3	* 200	* 100*	100*	100*
*3	* 100	* 100*	100*	100*
*3	* 000	*	*	*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Chartiers Run

Reach	River Sta.	Contr.	Expan.
*2	* 1300	* .1*	.3*
*2	* 1200	* .1*	.3*
*2	* 1100	* .1*	.3*
*2	* 1000	* .1*	.3*
*2	* 900	* .1*	.3*
*2	* 800	* .1*	.3*
*2	* 700	* .1*	.3*
*2	* 600	* .1*	.3*
*2	* 500	* .1*	.3*
*2	* 400	* .1*	.3*
*2	* 300	* .1*	.3*
*2	* 200	* .1*	.3*
*2	* 100	* .1*	.3*
*2	* 000	* .1*	.3*
*1	* 690	* .1*	.3*
*1	* 000	* .1*	.3*

River: Westland Run

Reach	River Sta.	Contr.	Expan.
*3	* 700	* .1*	.3*
*3	* 600	* .1*	.3*
*3	* 500	* .1*	.3*
*3	* 400	* .1*	.3*
*3	* 300	* .1*	.3*
*3	* 292	*Bridge	*	*
*3	* 275	* .1*	.3*
*3	* 200	* .1*	.3*
*3	* 100	* .1*	.3*
*3	* 000	* .1*	.3*

Plan: Plan 36 Chartiers Run 2 RS: 1300 Profile: 100yr Storm

E.G. Elev (ft)	1001.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.07	Wt. n-Val.		0.045	
W.S. Elev (ft)	999.36	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	999.06	Flow Area (sq ft)		144.43	
E.G. Slope (ft/ft)	0.018310	Area (sq ft)		144.43	
Q Total (cfs)	1666.75	Flow (cfs)		1666.75	
Top Width (ft)	29.67	Top Width (ft)		29.67	
Vel Total (ft/s)	11.54	Avg. Vel. (ft/s)		11.54	
Max Chl Dpth (ft)	6.64	Hydr. Depth (ft)		4.87	
Conv. Total (cfs)	12317.6	Conv. (cfs)		12317.6	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		34.80	
Min Ch El (ft)	992.72	Shear (lb/sq ft)		4.74	
Alpha	1.00	Stream Power (lb/ft s)	522.21	0.00	0.00
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	15.03	5.74	2.83
C & E Loss (ft)	0.53	Cum SA (acres)	5.33	0.76	0.80

Plan: Plan 36 Chartiers Run 2 RS: 1200 Profile: 100yr Storm

E.G. Elev (ft)	1000.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	1000.07	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	209.23	131.58	154.27
E.G. Slope (ft/ft)	0.002465	Area (sq ft)	209.23	131.58	154.27
Q Total (cfs)	1666.75	Flow (cfs)	757.94	709.05	199.76
Top Width (ft)	180.51	Top Width (ft)	92.71	21.62	66.18
Vel Total (ft/s)	3.37	Avg. Vel. (ft/s)	3.62	5.39	1.29
Max Chl Dpth (ft)	6.79	Hydr. Depth (ft)	2.26	6.09	2.33
Conv. Total (cfs)	33572.7	Conv. (cfs)	15267.0	14282.1	4023.6
Length Wtd. (ft)	100.00	Wetted Per. (ft)	92.86	22.08	66.34
Min Ch El (ft)	993.28	Shear (lb/sq ft)	0.35	0.92	0.36
Alpha	1.63	Stream Power (lb/ft s)	583.58	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	14.78	5.42	2.66
C & E Loss (ft)	0.02	Cum SA (acres)	5.23	0.70	0.73

Plan: Plan 36 Chartiers Run 2 RS: 1100 Profile: 100yr Storm

E.G. Elev (ft)	1000.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.035	0.045	
W.S. Elev (ft)	999.92	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	254.51	234.52	
E.G. Slope (ft/ft)	0.001636	Area (sq ft)	254.51	234.52	
Q Total (cfs)	1666.75	Flow (cfs)	622.17	1044.58	
Top Width (ft)	183.70	Top Width (ft)	149.77	33.93	
Vel Total (ft/s)	3.41	Avg. Vel. (ft/s)	2.44	4.45	
Max Chl Dpth (ft)	9.16	Hydr. Depth (ft)	1.70	6.91	
Conv. Total (cfs)	41209.8	Conv. (cfs)	15382.9	25826.9	
Length Wtd. (ft)	100.00	Wetted Per. (ft)	149.83	38.50	
Min Ch El (ft)	990.76	Shear (lb/sq ft)	0.17	0.62	
Alpha	1.26	Stream Power (lb/ft s)	591.16	0.00	0.00
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	14.25	5.00	2.48
C & E Loss (ft)	0.04	Cum SA (acres)	4.95	0.64	0.65

Plan: Plan 36 Chartiers Run 2 RS: 1000 Profile: 100yr Storm

E.G. Elev (ft)	999.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	999.27	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	99.31	207.31	19.58
E.G. Slope (ft/ft)	0.004414	Area (sq ft)	99.31	207.31	19.58
Q Total (cfs)	1666.75	Flow (cfs)	263.32	1375.39	28.04
Top Width (ft)	153.87	Top Width (ft)	108.95	34.35	10.57
Vel Total (ft/s)	5.11	Avg. Vel. (ft/s)	2.65	6.63	1.43
Max Chl Dpth (ft)	6.66	Hydr. Depth (ft)	0.91	6.04	1.85
Conv. Total (cfs)	25086.4	Conv. (cfs)	3963.2	20701.2	422.0
Length Wtd. (ft)	100.00	Wetted Per. (ft)	108.97	39.42	11.20
Min Ch El (ft)	992.61	Shear (lb/sq ft)	0.25	1.45	0.48
Alpha	1.44	Stream Power (lb/ft s)	538.81	0.00	0.00
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	13.85	4.50	2.46
C & E Loss (ft)	0.09	Cum SA (acres)	4.65	0.56	0.64

Plan: Plan 36 Chartiers Run 2 RS: 900 Profile: 100yr Storm

E.G. Elev (ft)	999.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	999.16	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	134.51	162.10	269.34
E.G. Slope (ft/ft)	0.002489	Area (sq ft)	134.51	162.10	269.34
Q Total (cfs)	1666.75	Flow (cfs)	341.70	885.99	439.06
Top Width (ft)	209.39	Top Width (ft)	102.36	24.68	82.35
Vel Total (ft/s)	2.95	Avg. Vel. (ft/s)	2.54	5.47	1.63
Max Chl Dpth (ft)	8.13	Hydr. Depth (ft)	1.31	6.57	3.27
Conv. Total (cfs)	33411.1	Conv. (cfs)	6849.6	17760.2	8801.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	102.39	26.82	82.59
Min Ch El (ft)	991.03	Shear (lb/sq ft)	0.20	0.94	0.51
Alpha	2.06	Stream Power (lb/ft s)	600.84	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	13.58	4.07	2.12
C & E Loss (ft)	0.02	Cum SA (acres)	4.41	0.49	0.53

Plan: Plan 36 Chartiers Run 2 RS: 800 Profile: 100yr Storm

E.G. Elev (ft)	999.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.99	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	180.41	194.69	206.98
E.G. Slope (ft/ft)	0.001783	Area (sq ft)	180.41	194.69	206.98
Q Total (cfs)	1666.75	Flow (cfs)	423.68	928.33	314.74
Top Width (ft)	203.04	Top Width (ft)	120.23	28.56	54.25
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)	2.35	4.77	1.52
Max Chl Dpth (ft)	8.02	Hydr. Depth (ft)	1.50	6.82	3.82
Conv. Total (cfs)	39476.4	Conv. (cfs)	10034.7	21987.1	7454.6
Length Wtd. (ft)	100.00	Wetted Per. (ft)	120.31	30.78	54.85
Min Ch El (ft)	990.97	Shear (lb/sq ft)	0.17	0.70	0.42
Alpha	1.77	Stream Power (lb/ft s)	642.81	0.00	0.00
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	13.22	3.66	1.58
C & E Loss (ft)	0.02	Cum SA (acres)	4.15	0.43	0.37

Plan: Plan 36 Chartiers Run 2 RS: 700 Profile: 100yr Storm

E.G. Elev (ft)	998.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.51	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	158.54	211.03	6.10
E.G. Slope (ft/ft)	0.002726	Area (sq ft)	158.54	211.03	6.10
Q Total (cfs)	1666.75	Flow (cfs)	376.25	1285.07	5.43
Top Width (ft)	173.43	Top Width (ft)	141.66	28.52	3.25
Vel Total (ft/s)	4.44	Avg. Vel. (ft/s)	2.37	6.09	0.89
Max Chl Dpth (ft)	8.17	Hydr. Depth (ft)	1.12	7.40	1.88
Conv. Total (cfs)	31926.1	Conv. (cfs)	7207.0	24615.1	104.0
Length Wtd. (ft)	100.00	Wetted Per. (ft)	143.08	31.79	4.97
Min Ch El (ft)	990.34	Shear (lb/sq ft)	0.19	1.13	0.21
Alpha	1.52	Stream Power (lb/ft s)	614.49	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	12.83	3.20	1.33
C & E Loss (ft)	0.12	Cum SA (acres)	3.85	0.36	0.31

Plan: Plan 36 Chartiers Run 2 RS: 600 Profile: 100yr Storm

E.G. Elev (ft)	998.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.70	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	703.01	144.42	39.01
E.G. Slope (ft/ft)	0.000420	Area (sq ft)	703.01	144.42	39.01
Q Total (cfs)	1666.75	Flow (cfs)	1290.80	352.68	23.27
Top Width (ft)	261.72	Top Width (ft)	229.14	19.71	12.87
Vel Total (ft/s)	1.88	Avg. Vel. (ft/s)	1.84	2.44	0.60
Max Chl Dpth (ft)	7.85	Hydr. Depth (ft)	3.07	7.33	3.03
Conv. Total (cfs)	81352.8	Conv. (cfs)	63003.2	17214.0	1135.7
Length Wtd. (ft)	100.00	Wetted Per. (ft)	229.22	21.06	14.23
Min Ch El (ft)	990.85	Shear (lb/sq ft)	0.08	0.18	0.07
Alpha	1.10	Stream Power (lb/ft s)	649.16	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	11.84	2.79	1.28
C & E Loss (ft)	0.01	Cum SA (acres)	3.43	0.31	0.29

Plan: Plan 36 Chartiers Run 2 RS: 500 Profile: 100yr Storm

E.G. Elev (ft)	998.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.56	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	467.05	154.16	16.95
E.G. Slope (ft/ft)	0.001000	Area (sq ft)	467.05	154.16	16.95
Q Total (cfs)	1666.75	Flow (cfs)	1065.68	588.18	12.89
Top Width (ft)	236.56	Top Width (ft)	210.72	20.00	5.84
Vel Total (ft/s)	2.61	Avg. Vel. (ft/s)	2.28	3.82	0.76
Max Chl Dpth (ft)	8.76	Hydr. Depth (ft)	2.22	7.71	2.90
Conv. Total (cfs)	52709.1	Conv. (cfs)	33700.9	18600.5	407.7
Length Wtd. (ft)	100.00	Wetted Per. (ft)	210.78	22.07	8.23
Min Ch El (ft)	989.80	Shear (lb/sq ft)	0.14	0.44	0.13
Alpha	1.24	Stream Power (lb/ft s)	626.63	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	10.50	2.45	1.22
C & E Loss (ft)	0.00	Cum SA (acres)	2.92	0.26	0.27

Plan: Plan 36 Chartiers Run 2 RS: 400 Profile: 100yr Storm

E.G. Elev (ft)	998.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.42	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	398.30	179.44	7.99
E.G. Slope (ft/ft)	0.001308	Area (sq ft)	398.30	179.44	7.99
Q Total (cfs)	1666.75	Flow (cfs)	934.05	727.39	5.31
Top Width (ft)	240.51	Top Width (ft)	210.72	25.09	4.70
Vel Total (ft/s)	2.85	Avg. Vel. (ft/s)	2.35	4.05	0.67
Max Chl Dpth (ft)	7.85	Hydr. Depth (ft)	1.89	7.15	1.70
Conv. Total (cfs)	46082.9	Conv. (cfs)	25824.8	20111.1	146.9
Length Wtd. (ft)	100.00	Wetted Per. (ft)	211.04	28.70	5.80
Min Ch El (ft)	990.57	Shear (lb/sq ft)	0.15	0.51	0.11
Alpha	1.27	Stream Power (lb/ft s)	605.13	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	9.50	2.06	1.19
C & E Loss (ft)	0.01	Cum SA (acres)	2.44	0.21	0.26

Plan: Plan 36 Chartiers Run 2 RS: 300 Profile: 100yr Storm

E.G. Elev (ft)	998.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.32	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	408.76	197.89	51.65
E.G. Slope (ft/ft)	0.001016	Area (sq ft)	408.76	197.89	51.65
Q Total (cfs)	1666.75	Flow (cfs)	893.87	730.04	42.84
Top Width (ft)	247.24	Top Width (ft)	198.59	26.98	21.67
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)	2.19	3.69	0.83
Max Chl Dpth (ft)	8.17	Hydr. Depth (ft)	2.06	7.33	2.38
Conv. Total (cfs)	52299.1	Conv. (cfs)	28047.9	22907.1	1344.1
Length Wtd. (ft)	100.00	Wetted Per. (ft)	198.93	30.15	22.28
Min Ch El (ft)	990.15	Shear (lb/sq ft)	0.13	0.42	0.15
Alpha	1.33	Stream Power (lb/ft s)	578.12	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	8.58	1.63	1.12
C & E Loss (ft)	0.02	Cum SA (acres)	1.97	0.15	0.23

Plan: Plan 36 Chartiers Run 2 RS: 200 Profile: 100yr Storm

E.G. Elev (ft)	998.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.31	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	665.29	162.59	124.12
E.G. Slope (ft/ft)	0.000431	Area (sq ft)	665.29	162.59	124.12
Q Total (cfs)	1666.75	Flow (cfs)	1150.24	415.51	101.01
Top Width (ft)	290.08	Top Width (ft)	242.00	20.46	27.62
Vel Total (ft/s)	1.75	Avg. Vel. (ft/s)	1.73	2.56	0.81
Max Chl Dpth (ft)	8.82	Hydr. Depth (ft)	2.75	7.95	4.49
Conv. Total (cfs)	80289.2	Conv. (cfs)	55408.1	20015.5	4865.5
Length Wtd. (ft)	100.00	Wetted Per. (ft)	242.13	22.59	28.97
Min Ch El (ft)	989.49	Shear (lb/sq ft)	0.07	0.19	0.12
Alpha	1.22	Stream Power (lb/ft s)	581.57	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	7.34	1.22	0.92
C & E Loss (ft)	0.01	Cum SA (acres)	1.46	0.10	0.17

Plan: Plan 36 Chartiers Run 2 RS: 100 Profile: 100yr Storm

E.G. Elev (ft)	998.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.31	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	1071.71	165.18	147.51
E.G. Slope (ft/ft)	0.000160	Area (sq ft)	1071.71	165.18	147.51
Q Total (cfs)	1666.75	Flow (cfs)	1338.46	261.83	66.46
Top Width (ft)	361.50	Top Width (ft)	301.98	20.50	39.02
Vel Total (ft/s)	1.20	Avg. Vel. (ft/s)	1.25	1.59	0.45
Max Chl Dpth (ft)	8.37	Hydr. Depth (ft)	3.55	8.06	3.78
Conv. Total (cfs)	131794.3	Conv. (cfs)	105835.8	20703.2	5255.3
Length Wtd. (ft)	100.00	Wetted Per. (ft)	302.09	22.34	39.73
Min Ch El (ft)	989.94	Shear (lb/sq ft)	0.04	0.07	0.04
Alpha	1.14	Stream Power (lb/ft s)	609.02	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	5.35	0.84	0.61
C & E Loss (ft)	0.00	Cum SA (acres)	0.84	0.05	0.09

Plan: Plan 36 Chartiers Run 2 RS: 000 Profile: 100yr Storm

E.G. Elev (ft)	998.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.035	0.045	0.100
W.S. Elev (ft)	998.31	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	1561.94	179.34	171.62
E.G. Slope (ft/ft)	0.000079	Area (sq ft)	1561.94	179.34	171.62
Q Total (cfs)	1666.75	Flow (cfs)	1397.43	211.98	57.33
Top Width (ft)	492.41	Top Width (ft)	428.26	22.09	42.07
Vel Total (ft/s)	0.87	Avg. Vel. (ft/s)	0.89	1.18	0.33
Max Chl Dpth (ft)	8.43	Hydr. Depth (ft)	3.65	8.12	4.08
Conv. Total (cfs)	187218.4	Conv. (cfs)	156967.2	23811.1	6440.1
Length Wtd. (ft)	100.00	Wetted Per. (ft)	428.88	22.24	42.76
Min Ch El (ft)	989.88	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.12	Stream Power (lb/ft s)	711.90	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	2.33	0.44	0.24
C & E Loss (ft)	0.07	Cum SA (acres)			

Plan: Plan 36 Chartiers Run 1 RS: 690 Profile: 100yr Storm

E.G. Elev (ft)	998.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	997.55	Reach Len. (ft)	690.00	690.00	690.00
Crit W.S. (ft)		Flow Area (sq ft)	464.74	207.54	37.09
E.G. Slope (ft/ft)	0.004457	Area (sq ft)	464.74	207.54	37.09
Q Total (cfs)	2950.00	Flow (cfs)	1164.02	1723.84	62.14
Top Width (ft)	156.49	Top Width (ft)	114.67	26.16	15.66
Vel Total (ft/s)	4.16	Avg. Vel. (ft/s)	2.50	8.31	1.68
Max Chl Dpth (ft)	8.58	Hydr. Depth (ft)	4.05	7.93	2.37
Conv. Total (cfs)	44189.1	Conv. (cfs)	17436.3	25822.0	930.8
Length Wtd. (ft)	690.00	Wetted Per. (ft)	115.83	28.37	16.89
Min Ch El (ft)	988.97	Shear (lb/sq ft)	1.12	2.04	0.61
Alpha	2.48	Stream Power (lb/ft s)	425.67	0.00	0.00
Frctn Loss (ft)	1.20	Cum Volume (acre-ft)	8.17	4.76	3.73
C & E Loss (ft)	0.15	Cum SA (acres)	1.93	0.55	0.76

Plan: Plan 36 Chartiers Run 1 RS: 000 Profile: 100yr Storm

E.G. Elev (ft)	996.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	996.70	Reach Len. (ft)			
Crit W.S. (ft)	992.88	Flow Area (sq ft)	567.43	393.95	434.39
E.G. Slope (ft/ft)	0.000916	Area (sq ft)	567.43	393.95	434.39
Q Total (cfs)	2950.00	Flow (cfs)	682.34	1672.94	594.71
Top Width (ft)	252.74	Top Width (ft)	129.14	43.00	80.60
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)	1.20	4.25	1.37
Max Chl Dpth (ft)	11.00	Hydr. Depth (ft)	4.39	9.16	5.39
Conv. Total (cfs)	97482.9	Conv. (cfs)	22548.1	55282.5	19652.3
Length Wtd. (ft)		Wetted Per. (ft)	129.75	44.97	81.77
Min Ch El (ft)	985.70	Shear (lb/sq ft)	0.25	0.50	0.30
Alpha	2.45	Stream Power (lb/ft s)	2222.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Plan: Plan 36 Westland Run 3 RS: 700 Profile: 100yr Storm

E.G. Elev (ft)	1000.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.53	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	386.70	176.84	133.83
E.G. Slope (ft/ft)	0.001310	Area (sq ft)	386.70	176.84	133.83
Q Total (cfs)	1283.25	Flow (cfs)	424.64	746.92	111.69
Top Width (ft)	224.94	Top Width (ft)	132.39	24.11	68.44
Vel Total (ft/s)	1.84	Avg. Vel. (ft/s)	1.10	4.22	0.83
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)	2.92	7.33	1.96
Conv. Total (cfs)	35453.0	Conv. (cfs)	11731.8	20635.5	3085.7
Length Wtd. (ft)	100.00	Wetted Per. (ft)	132.55	26.62	69.24
Min Ch El (ft)	992.52	Shear (lb/sq ft)	0.24	0.54	0.16
Alpha	3.20	Stream Power (lb/ft s)	453.67	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	7.04	3.82	8.59
C & E Loss (ft)	0.02	Cum SA (acres)	1.98	0.36	2.06

Plan: Plan 36 Westland Run 3 RS: 600 Profile: 100yr Storm

E.G. Elev (ft)	1000.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.45	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	285.67	143.75	428.32
E.G. Slope (ft/ft)	0.000988	Area (sq ft)	285.67	143.75	428.32
Q Total (cfs)	1283.25	Flow (cfs)	282.92	567.00	433.33
Top Width (ft)	243.11	Top Width (ft)	91.65	18.09	133.37
Vel Total (ft/s)	1.50	Avg. Vel. (ft/s)	0.99	3.94	1.01
Max Chl Dpth (ft)	8.84	Hydr. Depth (ft)	3.12	7.95	3.21
Conv. Total (cfs)	40835.9	Conv. (cfs)	9003.3	18043.2	13789.4
Length Wtd. (ft)	100.00	Wetted Per. (ft)	92.48	19.40	134.31
Min Ch El (ft)	991.61	Shear (lb/sq ft)	0.19	0.46	0.20
Alpha	3.32	Stream Power (lb/ft s)	400.80	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	6.27	3.45	7.94
C & E Loss (ft)	0.01	Cum SA (acres)	1.72	0.31	1.83

Plan: Plan 36 Westland Run 3 RS: 500 Profile: 100yr Storm

E.G. Elev (ft)	1000.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.27	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	393.35	175.88	90.11
E.G. Slope (ft/ft)	0.001148	Area (sq ft)	393.35	175.88	90.11
Q Total (cfs)	1283.25	Flow (cfs)	412.67	770.75	99.82
Top Width (ft)	178.02	Top Width (ft)	130.10	21.37	26.55
Vel Total (ft/s)	1.95	Avg. Vel. (ft/s)	1.05	4.38	1.11
Max Chl Dpth (ft)	8.67	Hydr. Depth (ft)	3.02	8.23	3.39
Conv. Total (cfs)	37878.0	Conv. (cfs)	12181.0	22750.5	2946.5
Length Wtd. (ft)	100.00	Wetted Per. (ft)	130.75	22.69	27.60
Min Ch El (ft)	991.60	Shear (lb/sq ft)	0.22	0.56	0.23
Alpha	3.16	Stream Power (lb/ft s)	382.90	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	5.49	3.08	7.35
C & E Loss (ft)	0.03	Cum SA (acres)	1.47	0.27	1.65

Plan: Plan 36 Westland Run 3 RS: 400 Profile: 100yr Storm

E.G. Elev (ft)	1000.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.24	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	571.85	180.75	89.49
E.G. Slope (ft/ft)	0.000716	Area (sq ft)	571.85	180.75	89.49
Q Total (cfs)	1283.25	Flow (cfs)	587.31	626.66	69.29
Top Width (ft)	189.61	Top Width (ft)	137.02	20.15	32.45
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)	1.03	3.47	0.77
Max Chl Dpth (ft)	9.77	Hydr. Depth (ft)	4.17	8.97	2.76
Conv. Total (cfs)	47972.3	Conv. (cfs)	21955.5	23426.7	2590.1
Length Wtd. (ft)	100.00	Wetted Per. (ft)	137.68	23.24	32.92
Min Ch El (ft)	990.47	Shear (lb/sq ft)	0.19	0.35	0.12
Alpha	2.75	Stream Power (lb/ft s)	327.35	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	4.38	2.67	7.14
C & E Loss (ft)	0.00	Cum SA (acres)	1.16	0.22	1.58

Plan: Plan 36 Westland Run 3 RS: 300 Profile: 100yr Storm

E.G. Elev (ft)	1000.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.14	Reach Len. (ft)	8.00	8.00	8.00
Crit W.S. (ft)	996.31	Flow Area (sq ft)	565.91	159.84	163.71
E.G. Slope (ft/ft)	0.000910	Area (sq ft)	565.91	159.84	163.71
Q Total (cfs)	1283.25	Flow (cfs)	576.30	607.76	99.19
Top Width (ft)	286.54	Top Width (ft)	164.60	18.13	103.80
Vel Total (ft/s)	1.44	Avg. Vel. (ft/s)	1.02	3.80	0.61
Max Chl Dpth (ft)	9.29	Hydr. Depth (ft)	3.44	8.82	1.58
Conv. Total (cfs)	42535.9	Conv. (cfs)	19102.7	20145.4	3287.8
Length Wtd. (ft)	8.00	Wetted Per. (ft)	165.28	21.44	104.19
Min Ch El (ft)	990.85	Shear (lb/sq ft)	0.19	0.42	0.09
Alpha	3.53	Stream Power (lb/ft s)	382.06	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	3.07	2.28	6.85
C & E Loss (ft)	0.01	Cum SA (acres)	0.82	0.18	1.42

Plan: Plan 36 Westland Run 3 RS: 292 BR U Profile: 100yr Storm

E.G. Elev (ft)	1000.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	1000.01	Reach Len. (ft)	16.00	16.00	16.00
Crit W.S. (ft)	999.37	Flow Area (sq ft)	279.38	118.09	109.99
E.G. Slope (ft/ft)	0.009425	Area (sq ft)	279.38	118.09	109.99
Q Total (cfs)	1283.25	Flow (cfs)	521.63	610.28	151.34
Top Width (ft)	280.20	Top Width (ft)	164.32	18.13	97.74
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)	1.87	5.17	1.38
Max Chl Dpth (ft)	9.16	Hydr. Depth (ft)	1.70	6.51	1.13
Conv. Total (cfs)	13217.9	Conv. (cfs)	5373.0	6286.1	1558.9
Length Wtd. (ft)	16.00	Wetted Per. (ft)	194.60	57.70	118.16
Min Ch El (ft)	990.85	Shear (lb/sq ft)	0.84	1.20	0.55
Alpha	2.24	Stream Power (lb/ft s)	382.06	0.00	0.00
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	2.99	2.26	6.83
C & E Loss (ft)	0.04	Cum SA (acres)	0.79	0.17	1.40

Plan: Plan 36 Westland Run 3 RS: 292 BR D Profile: 100yr Storm

E.G. Elev (ft)	999.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	999.37	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	999.37	Flow Area (sq ft)	175.43	106.58	56.89
E.G. Slope (ft/ft)	0.023470	Area (sq ft)	175.43	106.58	56.89
Q Total (cfs)	1283.25	Flow (cfs)	375.98	811.66	95.62
Top Width (ft)	250.56	Top Width (ft)	163.00	18.13	69.43
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)	2.14	7.62	1.68
Max Chl Dpth (ft)	8.52	Hydr. Depth (ft)	1.08	5.88	0.82
Conv. Total (cfs)	8376.3	Conv. (cfs)	2454.2	5298.0	624.1
Length Wtd. (ft)	1.00	Wetted Per. (ft)	193.14	57.70	89.84
Min Ch El (ft)	990.85	Shear (lb/sq ft)	1.33	2.71	0.93
Alpha	2.67	Stream Power (lb/ft s)	382.06	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	2.91	2.22	6.80
C & E Loss (ft)	0.00	Cum SA (acres)	0.73	0.17	1.37

Plan: Plan 36 Westland Run 3 RS: 275 Profile: 100yr Storm

E.G. Elev (ft)	998.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	998.07	Reach Len. (ft)	75.00	75.00	75.00
Crit W.S. (ft)		Flow Area (sq ft)	231.25	122.29	41.89
E.G. Slope (ft/ft)	0.004896	Area (sq ft)	231.25	122.29	41.89
Q Total (cfs)	1283.25	Flow (cfs)	319.62	902.13	61.51
Top Width (ft)	193.34	Top Width (ft)	150.60	18.13	24.62
Vel Total (ft/s)	3.25	Avg. Vel. (ft/s)	1.38	7.38	1.47
Max Chl Dpth (ft)	7.22	Hydr. Depth (ft)	1.54	6.75	1.70
Conv. Total (cfs)	18339.2	Conv. (cfs)	4567.7	12892.4	879.0
Length Wtd. (ft)	75.00	Wetted Per. (ft)	150.88	21.44	24.96
Min Ch El (ft)	990.85	Shear (lb/sq ft)	0.47	1.74	0.51
Alpha	3.69	Stream Power (lb/ft s)	382.06	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	2.91	2.21	6.79
C & E Loss (ft)	0.16	Cum SA (acres)	0.72	0.17	1.37

Plan: Plan 36 Westland Run 3 RS: 200 Profile: 100yr Storm

E.G. Elev (ft)	998.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.100	0.045	0.035
W.S. Elev (ft)	998.32	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	412.73	175.49	224.24
E.G. Slope (ft/ft)	0.000740	Area (sq ft)	412.73	175.49	224.24
Q Total (cfs)	1283.25	Flow (cfs)	311.04	549.78	422.43
Top Width (ft)	292.69	Top Width (ft)	161.96	23.22	107.51
Vel Total (ft/s)	1.58	Avg. Vel. (ft/s)	0.75	3.13	1.88
Max Chl Dpth (ft)	8.70	Hydr. Depth (ft)	2.55	7.56	2.09
Conv. Total (cfs)	47186.7	Conv. (cfs)	11437.3	20216.0	15533.4
Length Wtd. (ft)	100.00	Wetted Per. (ft)	162.06	26.93	107.60
Min Ch El (ft)	989.62	Shear (lb/sq ft)	0.12	0.30	0.10
Alpha	2.21	Stream Power (lb/ft s)	467.71	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	2.35	1.96	6.57
C & E Loss (ft)	0.02	Cum SA (acres)	0.45	0.13	1.26

Plan: Plan 36 Westland Run 3 RS: 100 Profile: 100yr Storm

E.G. Elev (ft)	998.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.100	0.045	0.035
W.S. Elev (ft)	998.34	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	179.70	233.48	902.03
E.G. Slope (ft/ft)	0.000133	Area (sq ft)	179.70	233.48	902.03
Q Total (cfs)	1283.25	Flow (cfs)	52.86	321.20	909.19
Top Width (ft)	414.15	Top Width (ft)	79.38	30.30	304.48
Vel Total (ft/s)	0.98	Avg. Vel. (ft/s)	0.29	1.38	1.01
Max Chl Dpth (ft)	9.18	Hydr. Depth (ft)	2.26	7.71	2.96
Conv. Total (cfs)	111447.2	Conv. (cfs)	4590.9	27895.1	78961.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	79.71	33.92	304.67
Min Ch El (ft)	989.16	Shear (lb/sq ft)	0.02	0.06	0.02
Alpha	1.26	Stream Power (lb/ft s)	543.23	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.67	1.49	5.27
C & E Loss (ft)	0.00	Cum SA (acres)	0.18	0.07	0.79

Plan: Plan 36 Westland Run 3 RS: 000 Profile: 100yr Storm

E.G. Elev (ft)	998.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.100	0.045	0.035
W.S. Elev (ft)	998.34	Reach Len. (ft)	170.00	170.00	170.00
Crit W.S. (ft)		Flow Area (sq ft)	180.20	263.22	1343.78
E.G. Slope (ft/ft)	0.000056	Area (sq ft)	180.20	263.22	1343.78
Q Total (cfs)	1283.25	Flow (cfs)	36.16	260.39	986.70
Top Width (ft)	483.70	Top Width (ft)	73.60	30.28	379.82
Vel Total (ft/s)	0.72	Avg. Vel. (ft/s)	0.20	0.99	0.73
Max Chl Dpth (ft)	9.47	Hydr. Depth (ft)	2.45	8.69	3.54
Conv. Total (cfs)	172227.5	Conv. (cfs)	4853.0	34947.8	132426.7
Length Wtd. (ft)	170.00	Wetted Per. (ft)	73.85	32.65	379.97
Min Ch El (ft)	988.87	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.19	Stream Power (lb/ft s)	645.48	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	1.26	0.92	2.69
C & E Loss (ft)	0.07	Cum SA (acres)			

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 1300

Description: 13+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1022
2	11.07	1020
3	20.94	1018
4	31.74	1016
5	49.99	1014
6	61.77	1012
7	97.91	1010
8	114.36	1008
9	125.87	1006
10	150.8	1004
11	164.76	1003.7
12	209.44	1002
13	220.48	1000
14	241.86	999.64
15	248.2	994.3
16	248.83	994.03
17	257.48	992.72
18	266.49	994.07
19	269.08	994.26
20	273.78	1002.86
21	310.1	1004
22	365.51	1004
23	382.39	1004
24	468.73	1006
25	483.56	1008
26	492.69	1010
27	501.23	1012
28	505.96	1014
29	510.6	1016
30	516.34	1018
31	522.21	1020
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

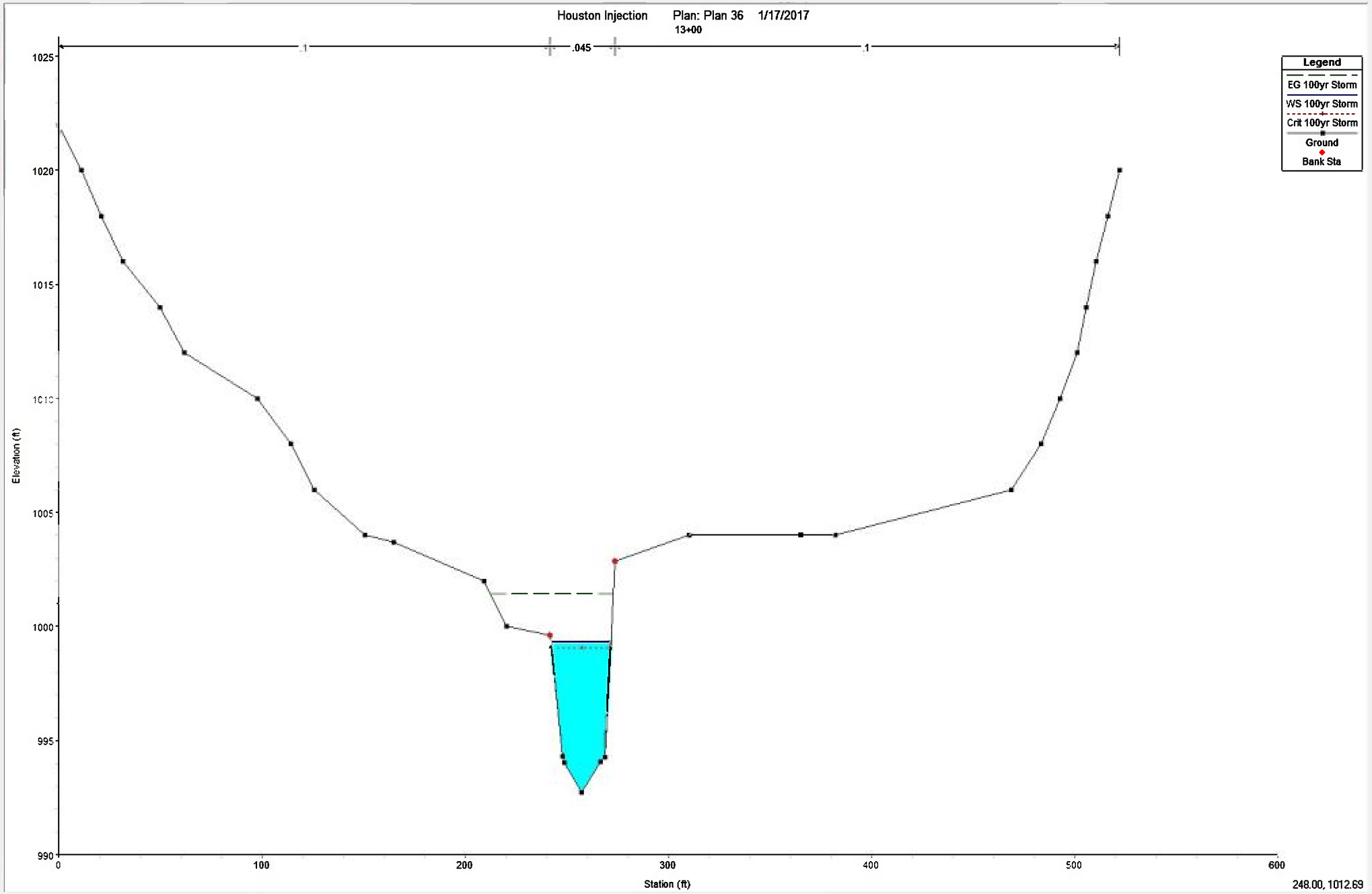
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
241.86	273.78

Contr. & Expan. Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Edit Station Elevation Data (ft)

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 2 | River Sta.: 12+00

Description: 12+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1022
2	6.34	1020
3	12.32	1018
4	18.56	1016
5	24.82	1014
6	34.91	1012
7	47.96	1010
8	74.92	1008
9	114.68	1006
10	133.11	1004
11	179.65	1002
12	263.05	999
13	325.95	995
14	328.64	994.32
15	330.02	993.89
16	335.85	993.28
17	342.23	993.95
18	344.59	994.23
19	347.57	995.41
20	526.28	1008
21	539.84	1010
22	550.59	1012
23	559.5	1014
24	568.23	1016
25	576.34	1018
26	583.58	1020
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

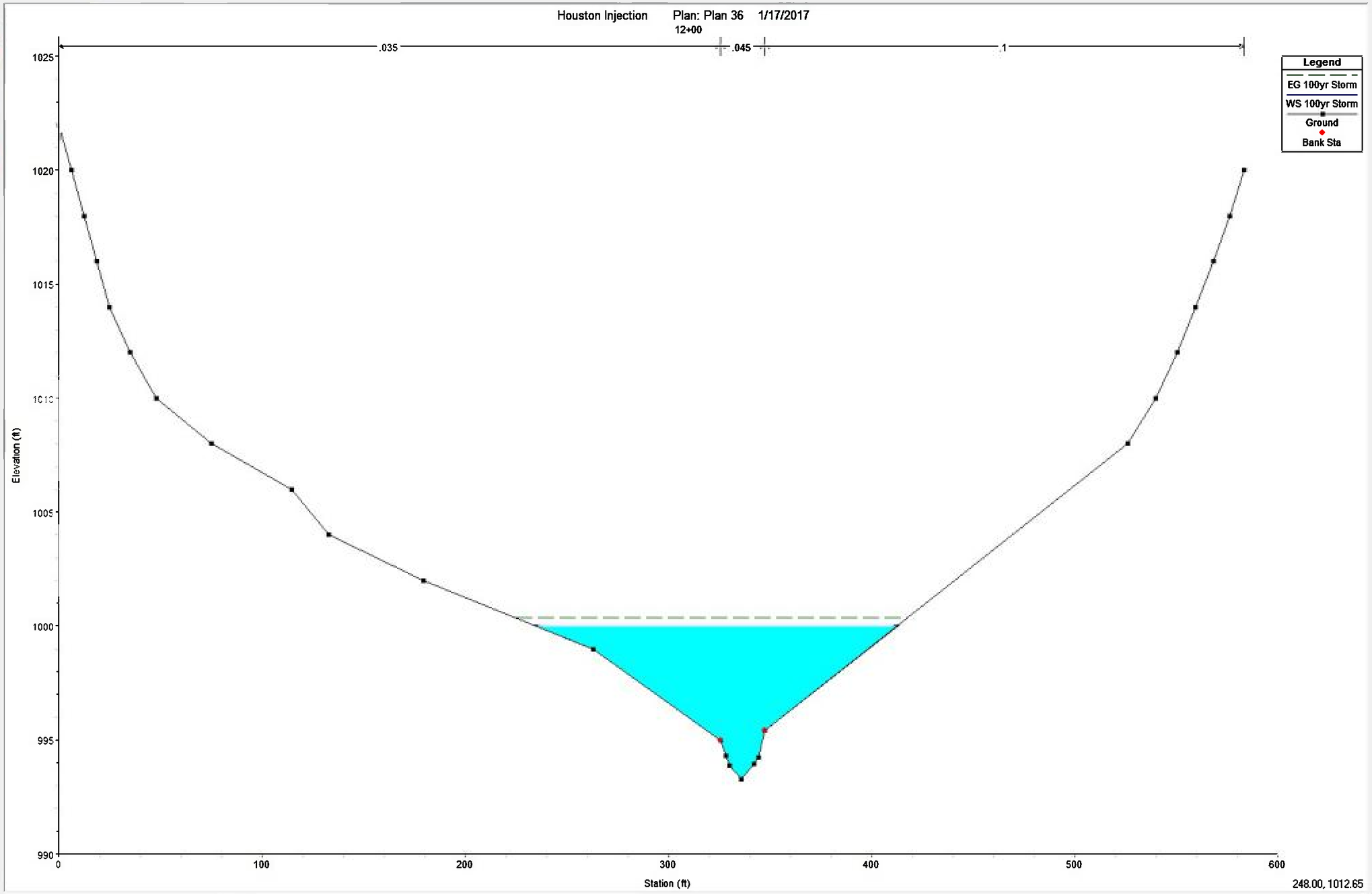
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
325.95	347.57

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 11000

Description: 11+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1020
2	5.56	1018
3	11.69	1016
4	17.69	1014
5	23.49	1012
6	32.37	1010
7	57	1008
8	90.4	1006
9	102.86	1004
10	141.39	1002
11	252.85	1000
12	324.8	998.7
13	376.75	997
14	407.3	995.87
15	410.28	993.33
16	410.45	993.34
17	424.95	990.76
18	435.44	993.29
19	436.12	993.53
20	441.29	999.99
21	481.01	1008
22	541.23	1010
23	557.62	1012
24	570.21	1014
25	577.45	1016
26	584.32	1018
27	591.16	1020
28–53		

Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

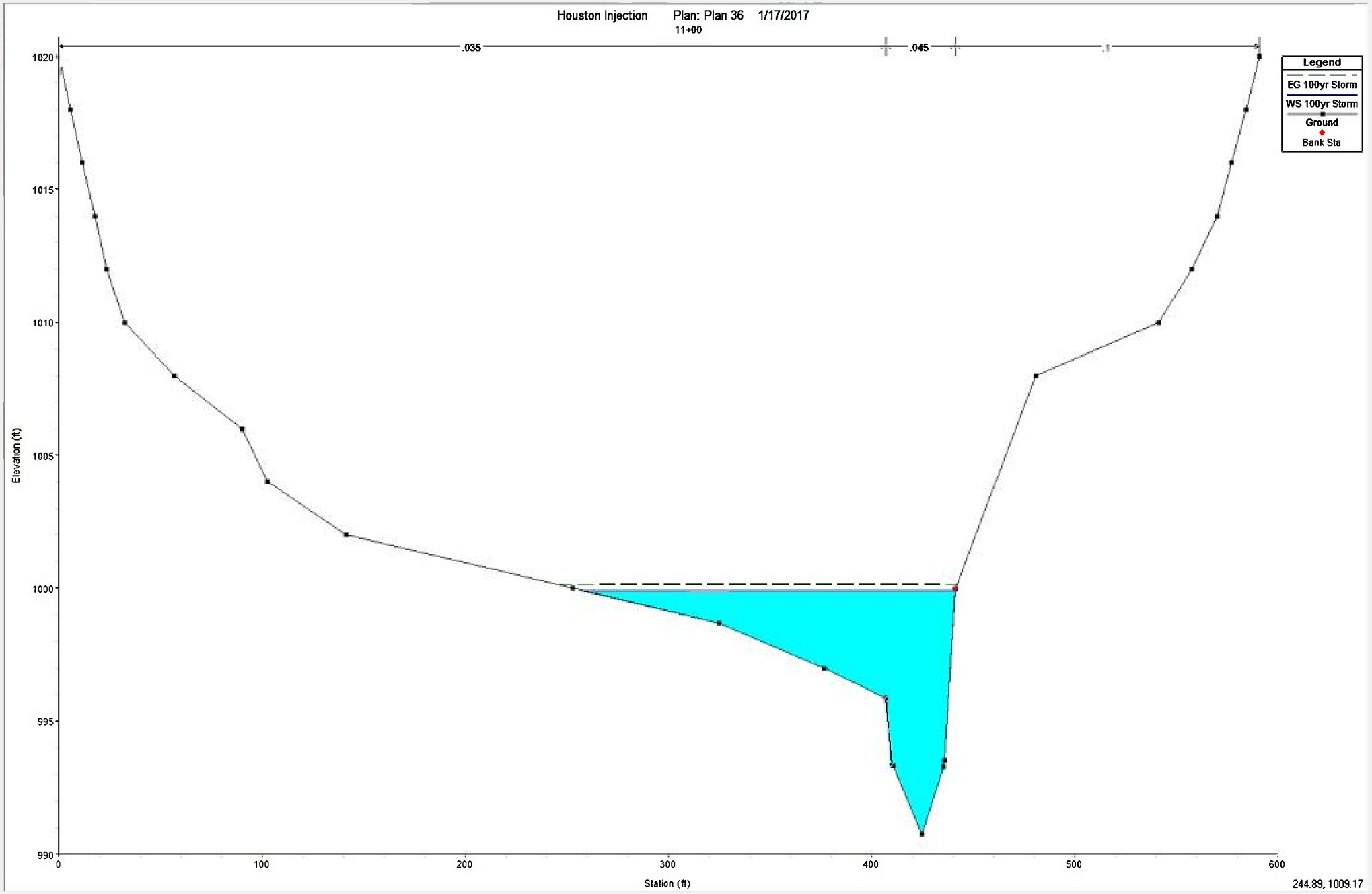
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
407.3	441.29

Contr/Ex. Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 1000

Description: 10+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	4.56	1016
3	10.03	1014
4	16.12	1012
5	24.25	1010
6	68.33	1008
7	85.19	1006
8	104.4	1004
9	164.4	1002
10	258.05	1000
11	410.45	997.45
12	412.99	993.5
13	413.63	993.25
14	424.72	993.2
15	444.4	992.71
16	444.68	992.61
17	444.8	995.57
18	463.16	1002
19	488.84	1002
20	493.82	1004
21	502.09	1006
22	513.73	1008
23	523.1	1010
24	529.27	1012
25	538.81	1014
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

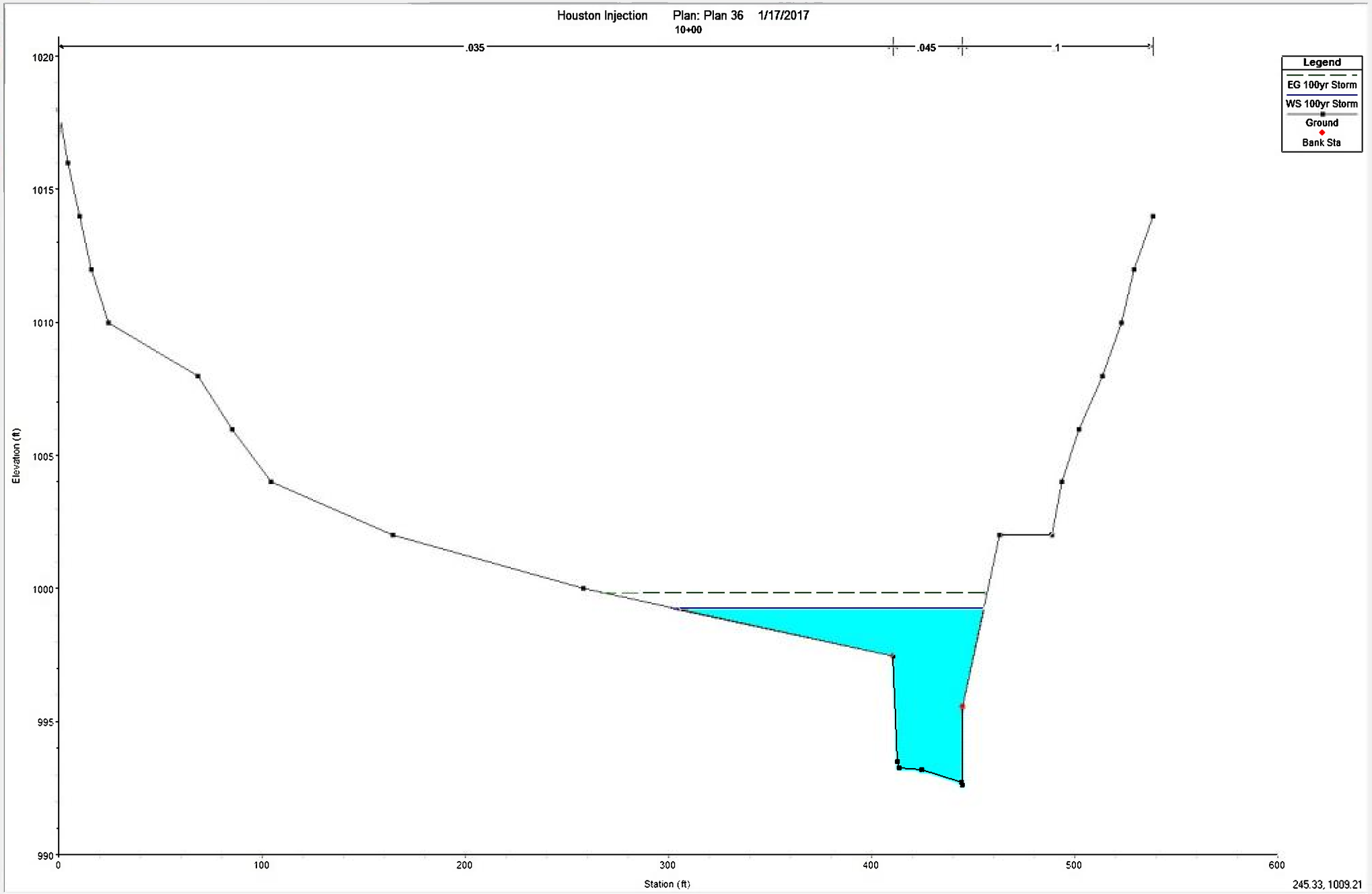
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
410.45	444.8

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 90

Description: 9+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	5.23	1016
3	10.73	1014
4	17.6	1012
5	32.87	1010
6	63.06	1009.01
7	98.76	1008
8	125.63	1006
9	219.27	1004
10	260.04	1002
11	318.57	1000
12	386.21	998
13	449.32	996.78
14	455.58	992.73
15	456.44	992.36
16	463.97	991.03
17	472.18	992.35
18	472.73	992.49
19	474	993.9
20	542.58	997
21	561.7	1000
22	566.33	1002
23	570.19	1004
24	574.97	1006
25	581.02	1008
26	587.22	1010
27	593.8	1012
28	600.84	1014
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

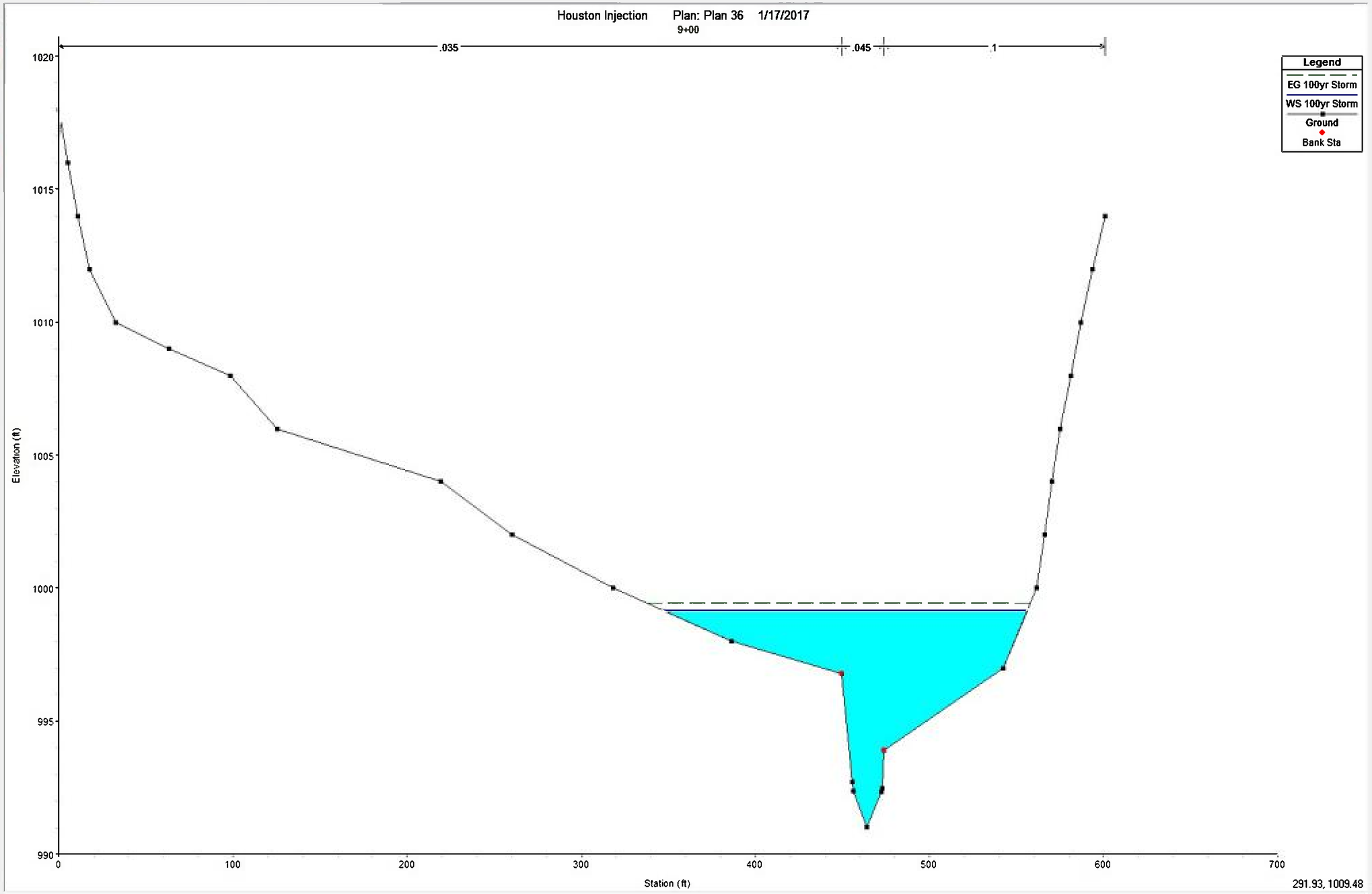
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
449.32	474

Con/Ex. Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 800

Description: 8+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1020
2	19.45	1018
3	26.39	1016
4	31.97	1014
5	37.47	1012
6	48.15	1010
7	129.59	1008
8	168.44	1006
9	245.01	1004
10	291.83	1002
11	340.73	1000
12	426.05	998
13	496.92	996
14	504.12	996.79
15	508.56	992.47
16	509.61	991.92
17	517.95	990.97
18	526.71	991.92
19	530.58	992.42
20	532.68	993.34
21	540.9	994
22	578.32	996
23	584.86	998
24	589.05	1000
25	593.45	1002
26	599.36	1002.6
27	620.86	1004
28	632.98	1006
29	638.18	1008
30	640.47	1010
31	642.81	1012
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

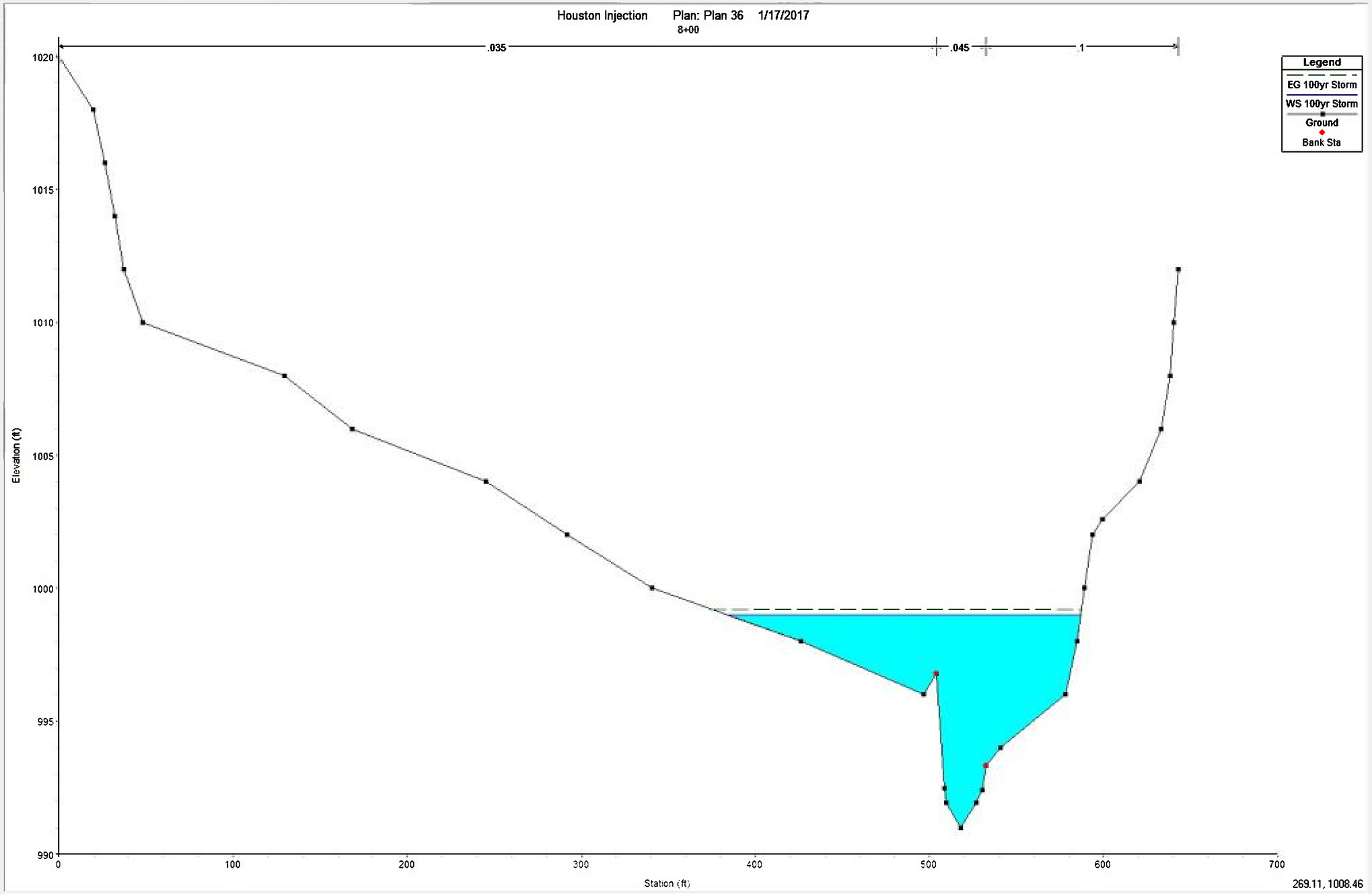
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
504.12	532.68

Contr. & Expan. Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 2 | River Sta.: 7+00

Description: 7+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	8.32	1016
3	31.4	1014
4	48.64	1012
5	65.7	1010
6	115.56	1008
7	130.19	1006
8	214.37	1004
9	269.16	1002
10	304.44	1000.89
11	335.41	1000
12	456.48	998
13	518.32	998
14	542.34	998
15	547.32	994
16	567.4	993.59
17	569.75	991.78
18	570.79	991.23
19	583.23	990.34
20	594.92	991.58
21	595.26	991.83
22	595.92	994.75
23	611.69	1013
24	614.49	1014
25–53		

Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

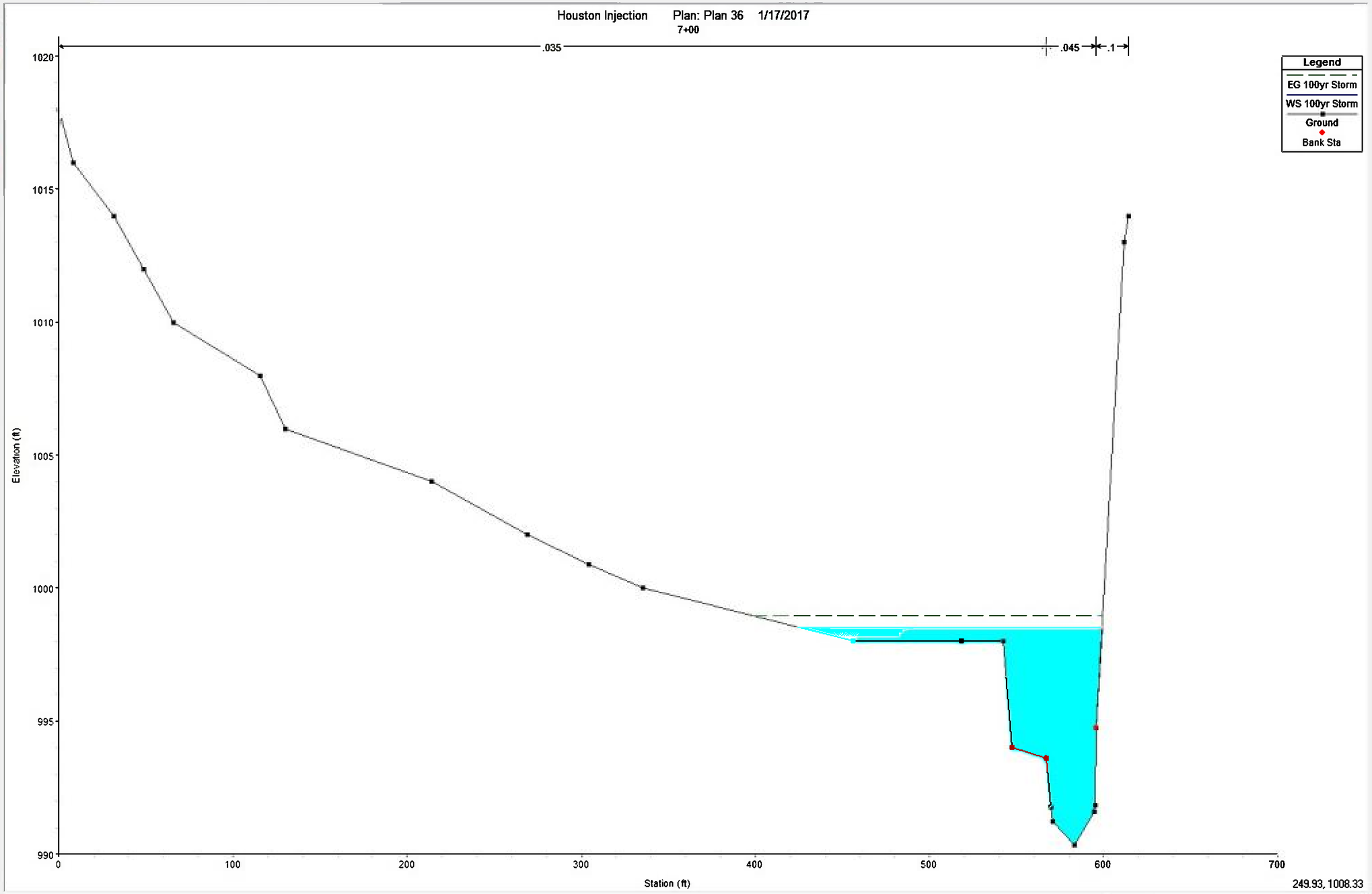
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
567.4	595.92

Contr/Ex. Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.:

Description: 6+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	8.28	1016
3	17.93	1014
4	24.97	1012
5	64.42	1010
6	109.73	1008
7	134.72	1006
8	209.95	1004
9	262.21	1002
10	285.57	1001.19
11	328.45	1000
12	414.43	997
13	594.77	993.07
14	596.71	992.38
15	596.94	991.44
16	604.59	990.85
17	612.65	991.44
18	613.49	991.63
19	614.48	992.64
20	644.96	1007
21	649.16	1010
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

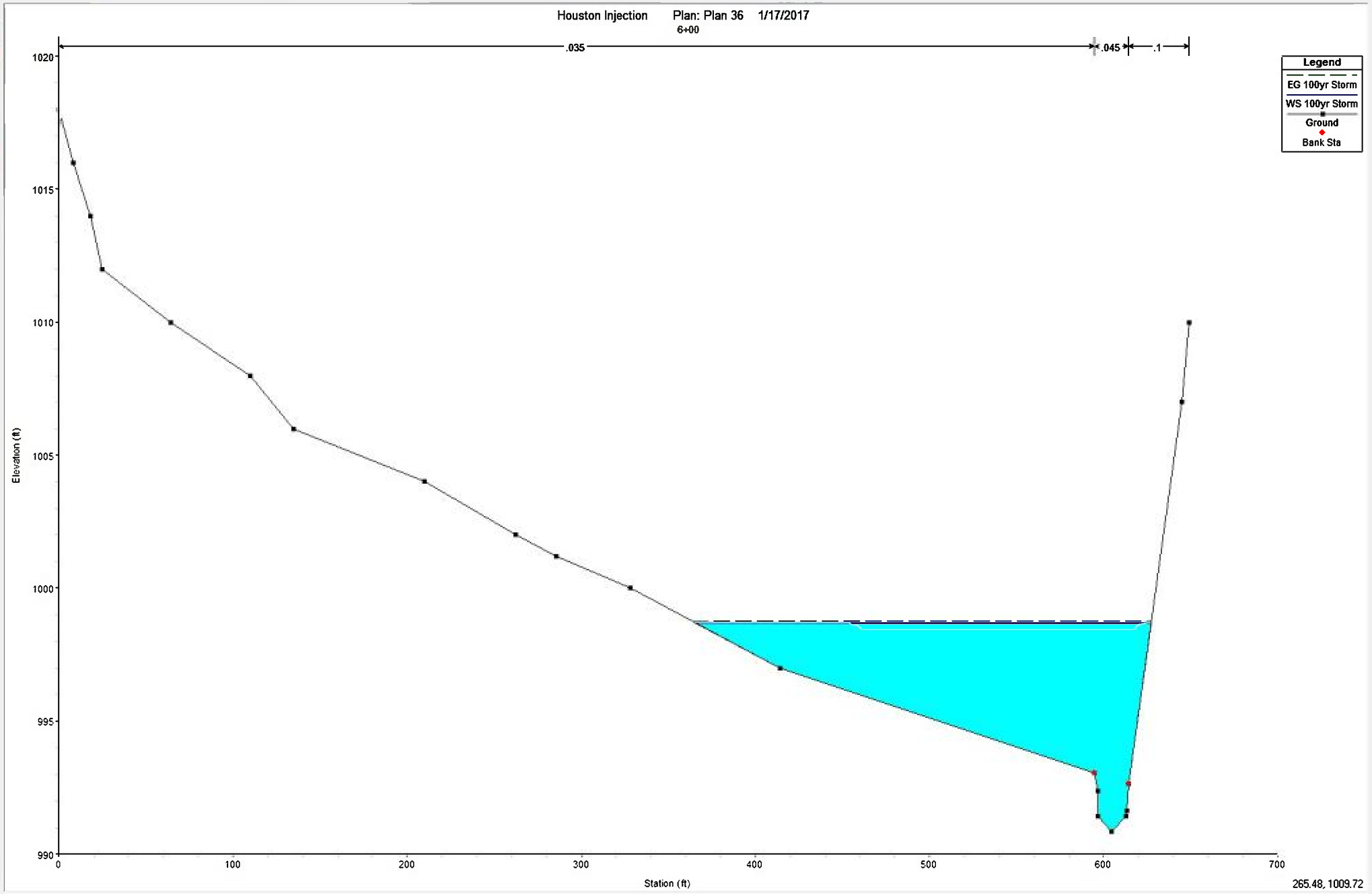
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
594.77	614.48

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 50

Description: 5+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1018
2	7.61	1016
3	14.82	1014
4	28.12	1012
5	77.14	1010
6	105.48	1008
7	169.46	1006
8	204.58	1004
9	246.73	1002
10	265.12	1001.15
11	289.81	1000
12	393.16	998
13	556.64	994.5
14	574.81	993.73
15	577.67	991.19
16	578.9	990.88
17	585.96	989.8
18	592.87	991.16
19	593.94	991.28
20	594.81	992.76
21	619.22	1017
22	626.63	1020
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

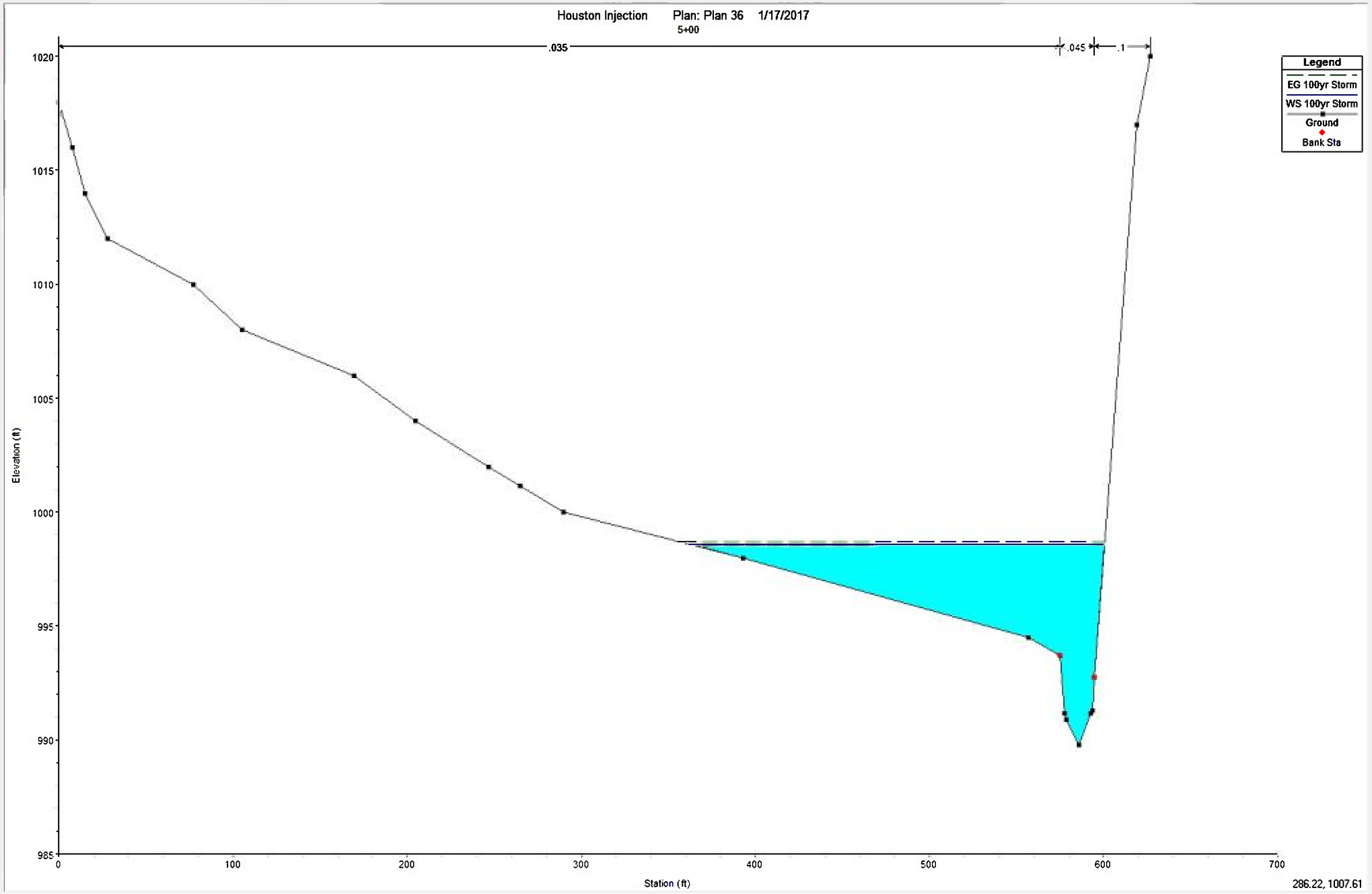
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
574.81	594.81

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.:

Description: 4+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1020
2	8.4	1018
3	16.74	1016
4	30.8	1014
5	87.62	1012
6	94.14	1010
7	112.83	1008
8	180.85	1006
9	197.47	1004
10	214.14	1002
11	268.8	1000
12	324.88	998.5293
13	332.7	996.4737
14	352.86	996.56
15	390.23	997.06
16	521.56	996
17	536.02	994.67
18	539.35	991.14
19	540.71	990.65
20	547.75	990.57
21	554.17	990.7
22	559.04	991.62
23	561.11	995.02
24	577.68	1007
25	599.84	1010
26	605.13	1012
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

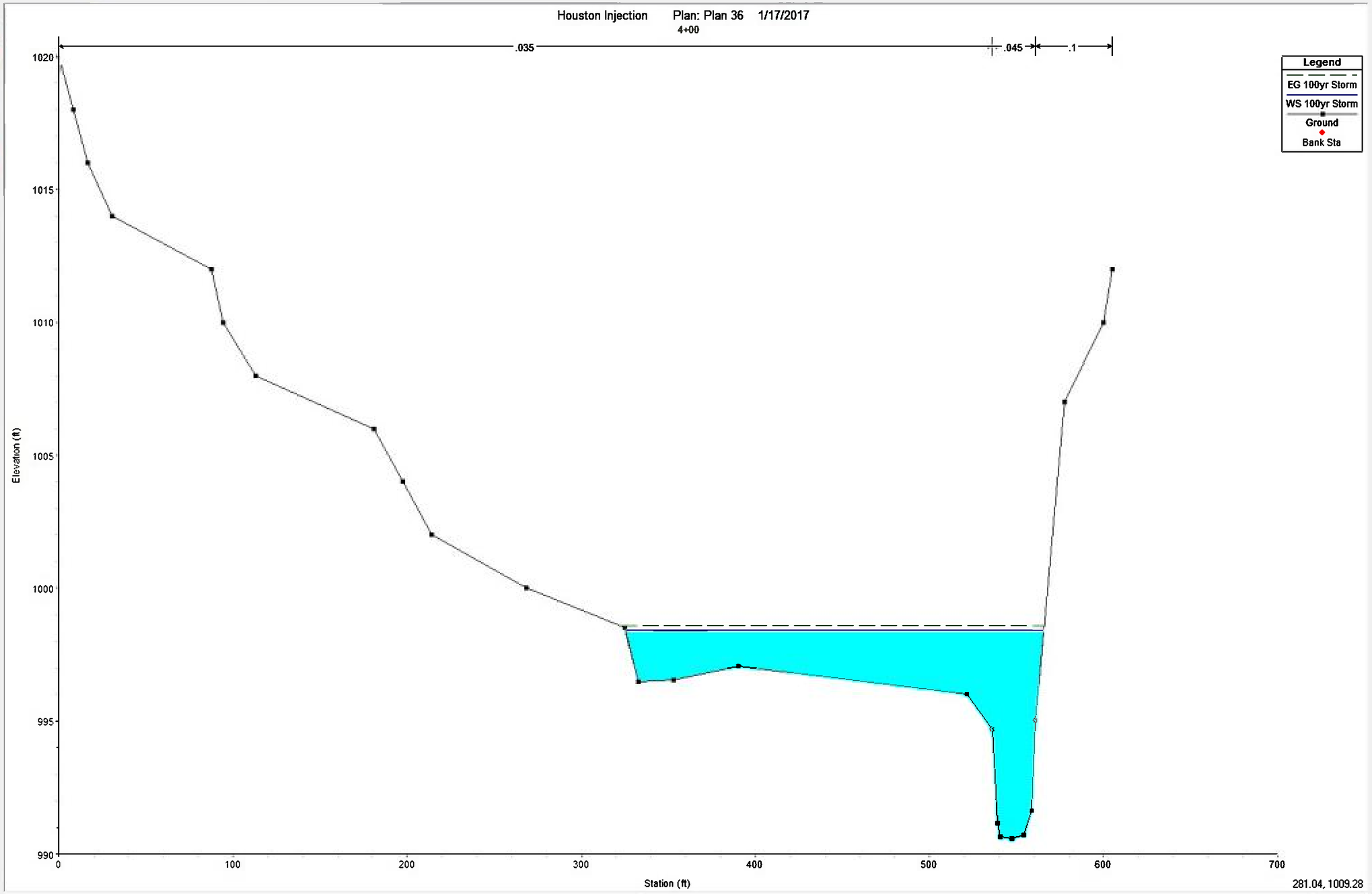
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
536.02	561.11

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 300

Description: 3+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1016
2	13.91	1014
3	69.69	1012
4	108.77	1010
5	117.37	1008
6	151.47	1006
7	154.28	1005.17
8	176.22	1003.8
9	213.5	1001.41
10	247.56	1000.28
11	281.48	999.14
12	317.23	998.05
13	352.99	997.46
14	359.31	995.4672
15	421.22	995.81
16	497.59	996
17	506.88	995.33
18	509.96	990.82
19	510.96	990.36
20	517.04	990.15
21	522.36	990.36
22	530.74	991.22
23	533.86	993.31
24	543.96	996
25	554.93	998
26	558.65	1000
27	561.82	1002
28	564.69	1004
29	567.54	1006
30	570.49	1008
31	574.04	1010
32	578.12	1012
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

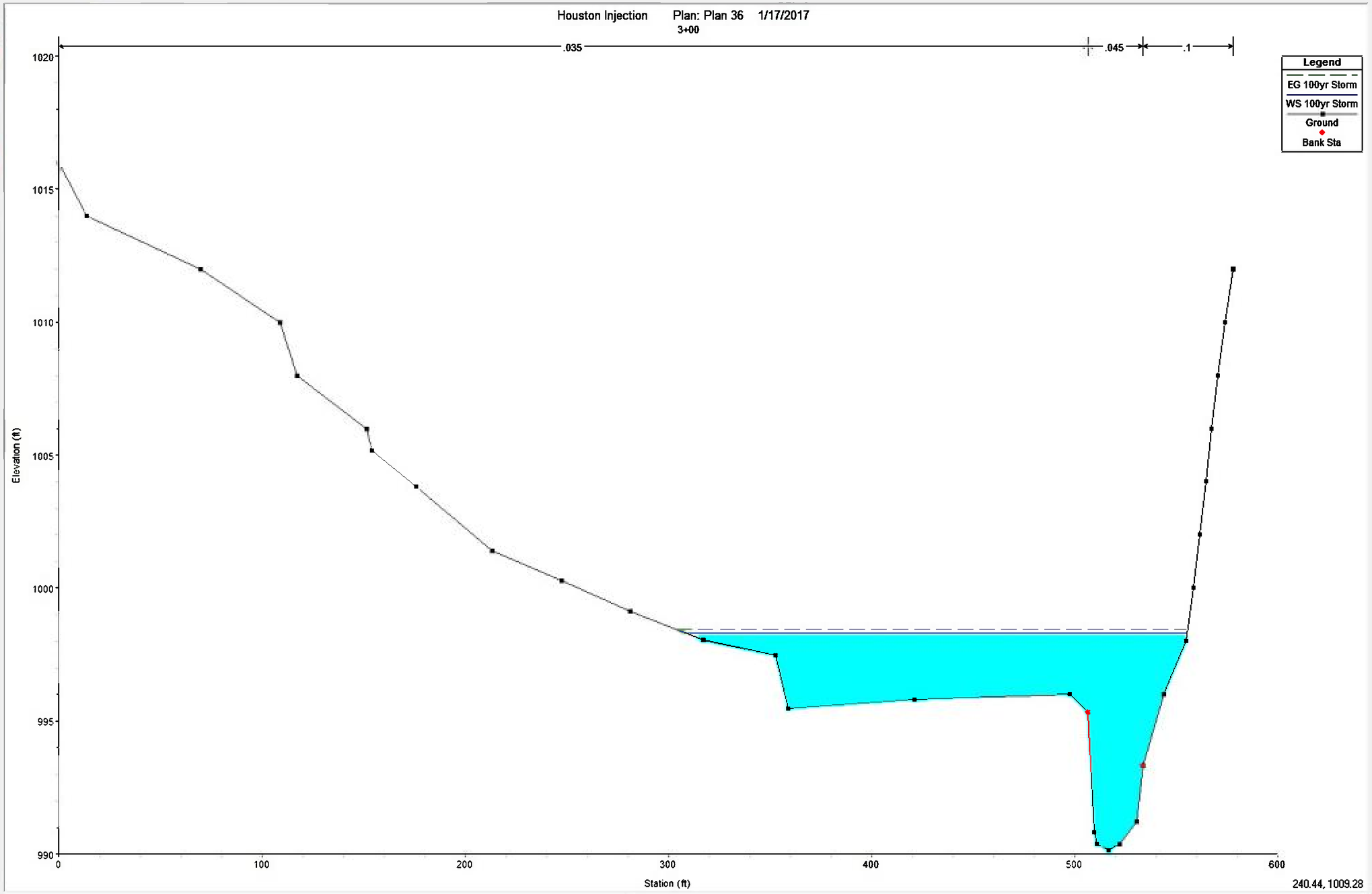
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
506.88	533.86

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 200

Description: 2+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1016
2	34.24	1014
3	54.23	1012
4	88.6	1010
5	105.26	1008
6	110.95	1006
7	134.75	1004
8	155.42	1002.4
9	163.09	1002.05
10	200.06	1000.43
11	234.34	999.48
12	267.77	998.38
13	301.14	997.53
14	340.5	996.86
15	370.78	994.4543
16	441.46	995.02
17	503.4	994
18	512.46	993.6
19	516.73	990.33
20	517.06	990.2
21	524.95	989.49
22	531.11	990.03
23	531.36	990.1
24	532.92	992.04
25	553.69	994
26	559.79	998
27	564.6	1000
28	568.47	1002
29	571.85	1004
30	575.03	1006
31	578.47	1008
32	581.57	1010
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

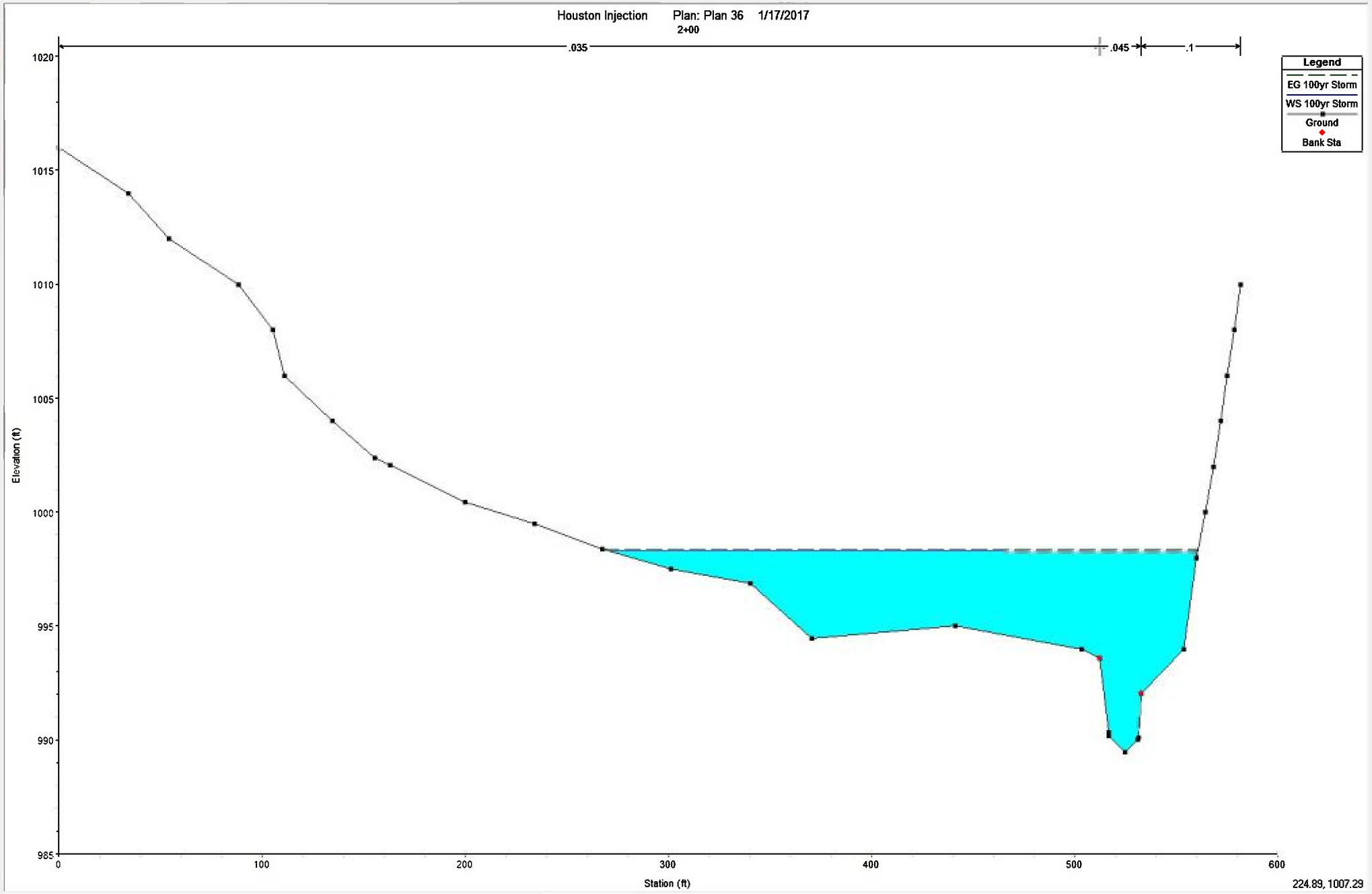
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
512.46	532.92

Contr. & Expan. Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run | Apply Data | Plot Options | Keep Prev XS Plots | Clear Prev

Reach: 2 | River Sta.: 100

Description: 1+00

Del Row | Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1016
2	18.49	1014
3	33	1012
4	57.1	1010
5	95.37	1008
6	101.51	1006
7	105.78	1004
8	121.71	1002
9	153.3	1000
10	156.48	999.9
11	181.48	998.88
12	216.34	998.65
13	251.28	997.64
14	292.32	994.97
15	332.22	994.44
16	456.12	994.2
17	530.11	993.13
18	531.92	990.21
19	532.37	990.09
20	541.57	989.94
21	550.34	990.46
22	550.61	990.82
23	588.39	998
24	596.38	1000
25	599.1	1002
26	601.43	1004
27	603.89	1006
28	606.39	1008
29	609.02	1010
30–53		

Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

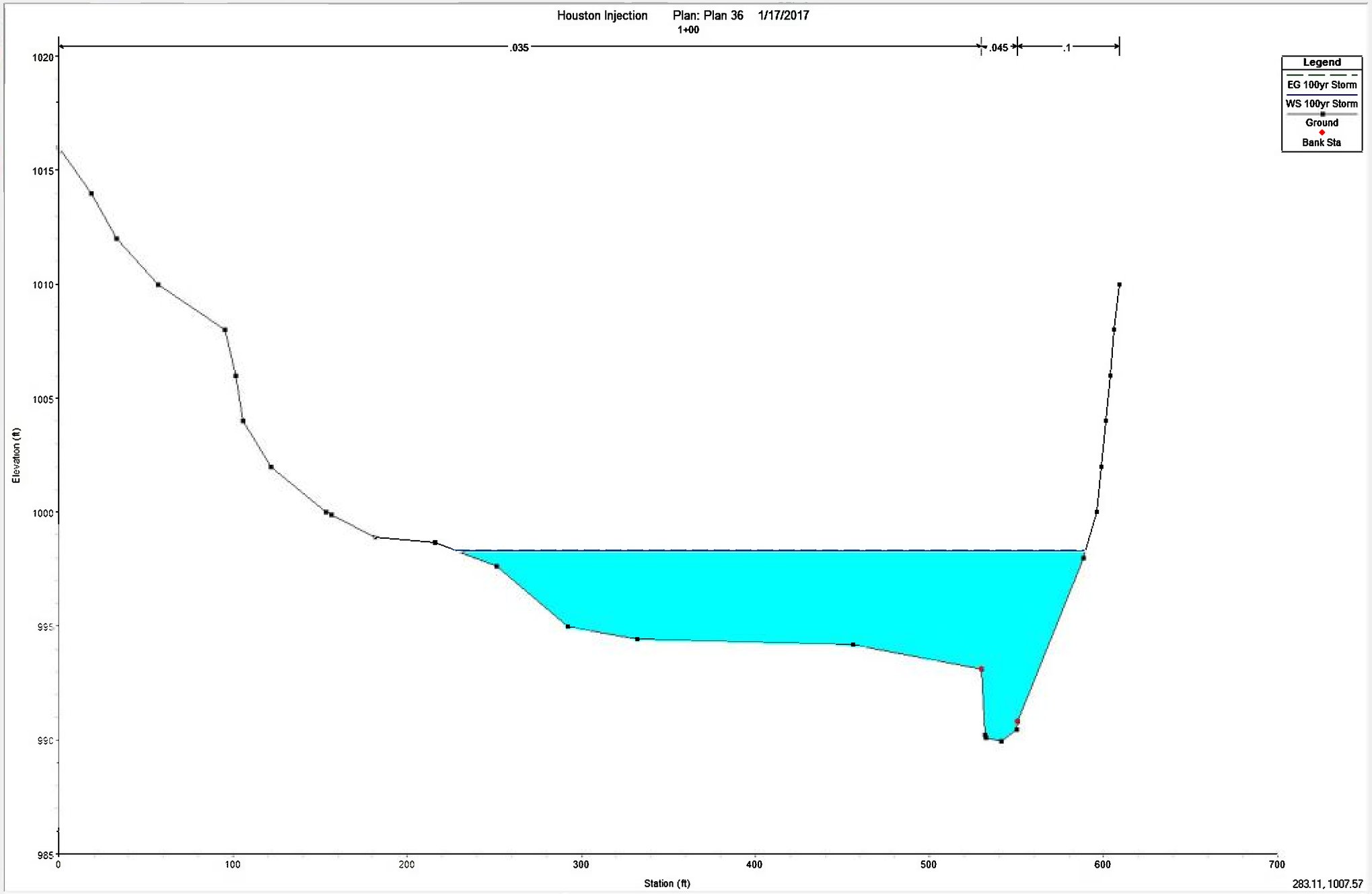
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
530.11	550.61

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 2 River Sta.: 000

Description: 0+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1016
2	38.1	1014
3	49.42	1012
4	58.9	1010
5	78.48	1008
6	110.64	1006
7	116.83	1004
8	123.89	1002
9	144.04	1000
10	168.76	998
11	171.2	997.18
12	199.55	997.13
13	234.47	995.71
14	275.65	995.12
15	317.06	994.56
16	368.67	994.07
17	405.94	993.92
18	581.95	994
19	593.22	990.81
20	594.99	990.31
21	595.58	990.32
22	604.62	989.88
23	612.46	990.26
24	613.01	990.33
25	615.31	990.86
26	648.51	996
27	655.74	998
28	666.41	1000
29	688.85	1002
30	697.85	1004
31	702.06	1006
32	705.65	1008
33	708.85	1010
34	711.9	1012
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Downstream Reach Lengths

LOB	Channel	ROB

Manning's n Values

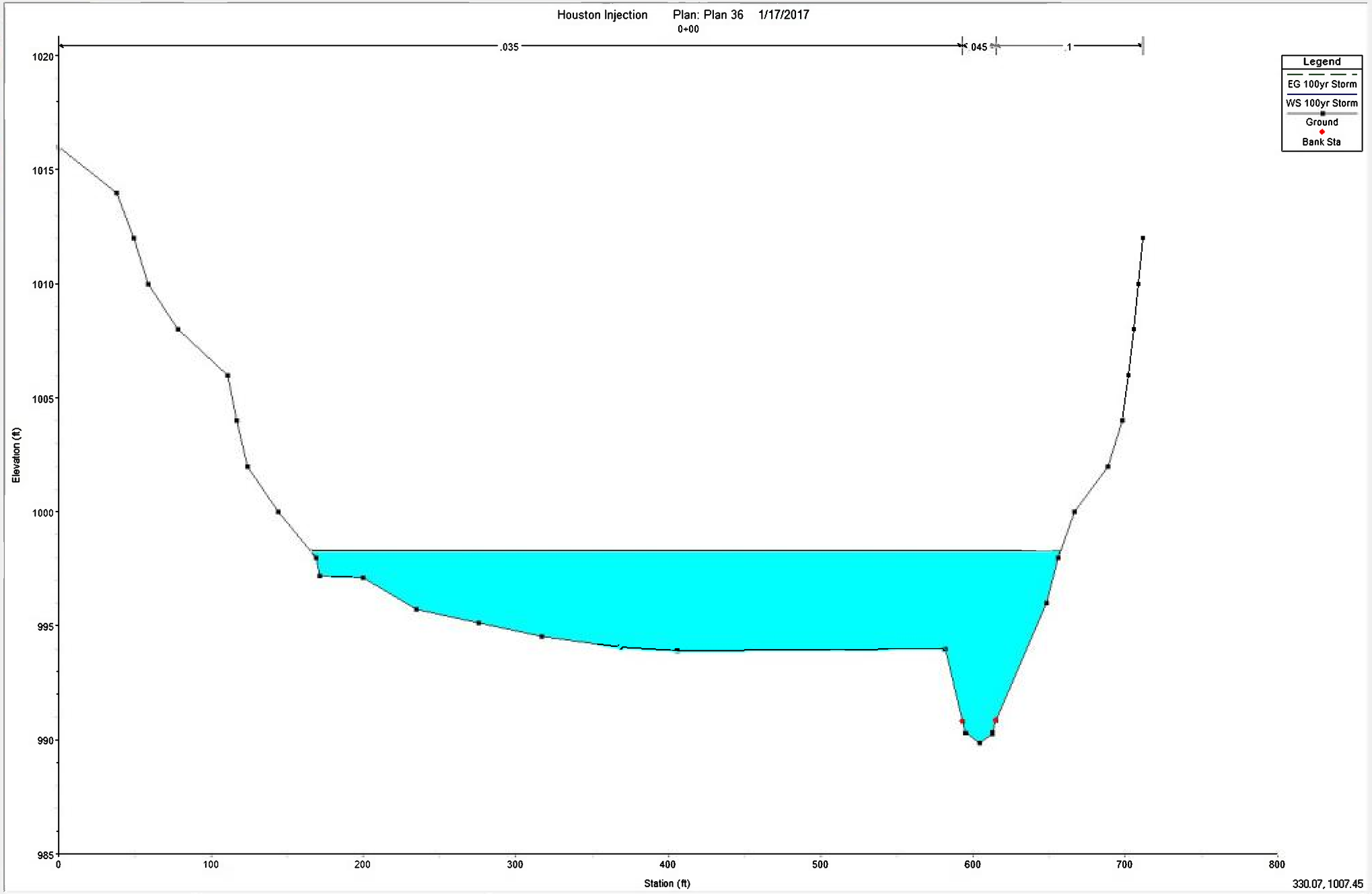
LOB	Channel	ROB
0.035	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
593.22	615.31

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: River Sta.: 690

Description: 0

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.834	1008.45
3	7.558	1006.45
4	12.239	1004.45
5	47.435	1002.45
6	51.871	1000.45
7	58.454	998.45
8	72.214	996.45
9	109.854	994.45
10	128.396	992.45
11	147.977	990.45
12	159.696	990.45
13	161.791	992.45
14	175.445	992.45
15	179.32	992.089
16	179.321	992.089
17	180.955	988.976
18	181.24	988.965
19	190.122	989.095
20	200.046	989.75
21	205.477	991.618
22	206.483	992.45
23	210.978	994.45
24	215.831	996.45
25	225.482	998.45
26	235.577	1000.45
27	249.658	1002.45
28	327.388	1003.59
29	419.755	1004.45
30	422.291	1006.45
31	424.189	1008.45
32	425.672	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
690	690	690

Manning's n Values

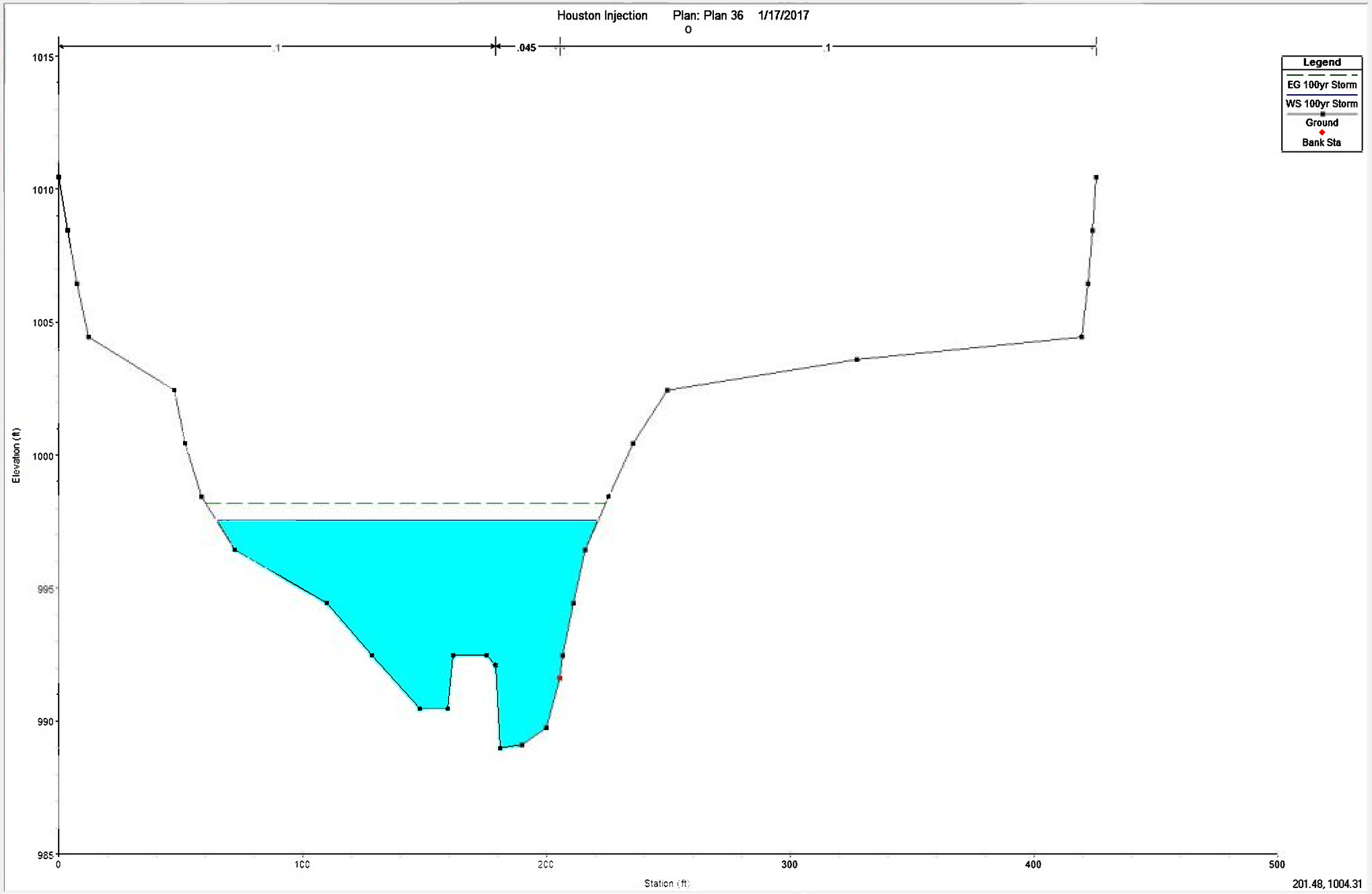
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
179.32	205.477

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select Reach for cross section editing

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Chartiers Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 1 River Sta.: 000

Description: N

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	1715	1006.3
2	1725	1000.4
3	1773	1000.4
4	1782	1001.8
5	1793	1001.8
6	1808	1001.4
7	1832	999.9
8	1850	993.4
9	1866	993.3
10	1901	992.3
11	1970	990.6
12	1987	986.7
13	1997	986.2
14	2000	985.9
15	2005	985.7
16	2006	986.2
17	2013	990.8
18	2038	990.3
19	2084	991.9
20	2098	998.9
21	2145	999.3
22	2222	1007
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

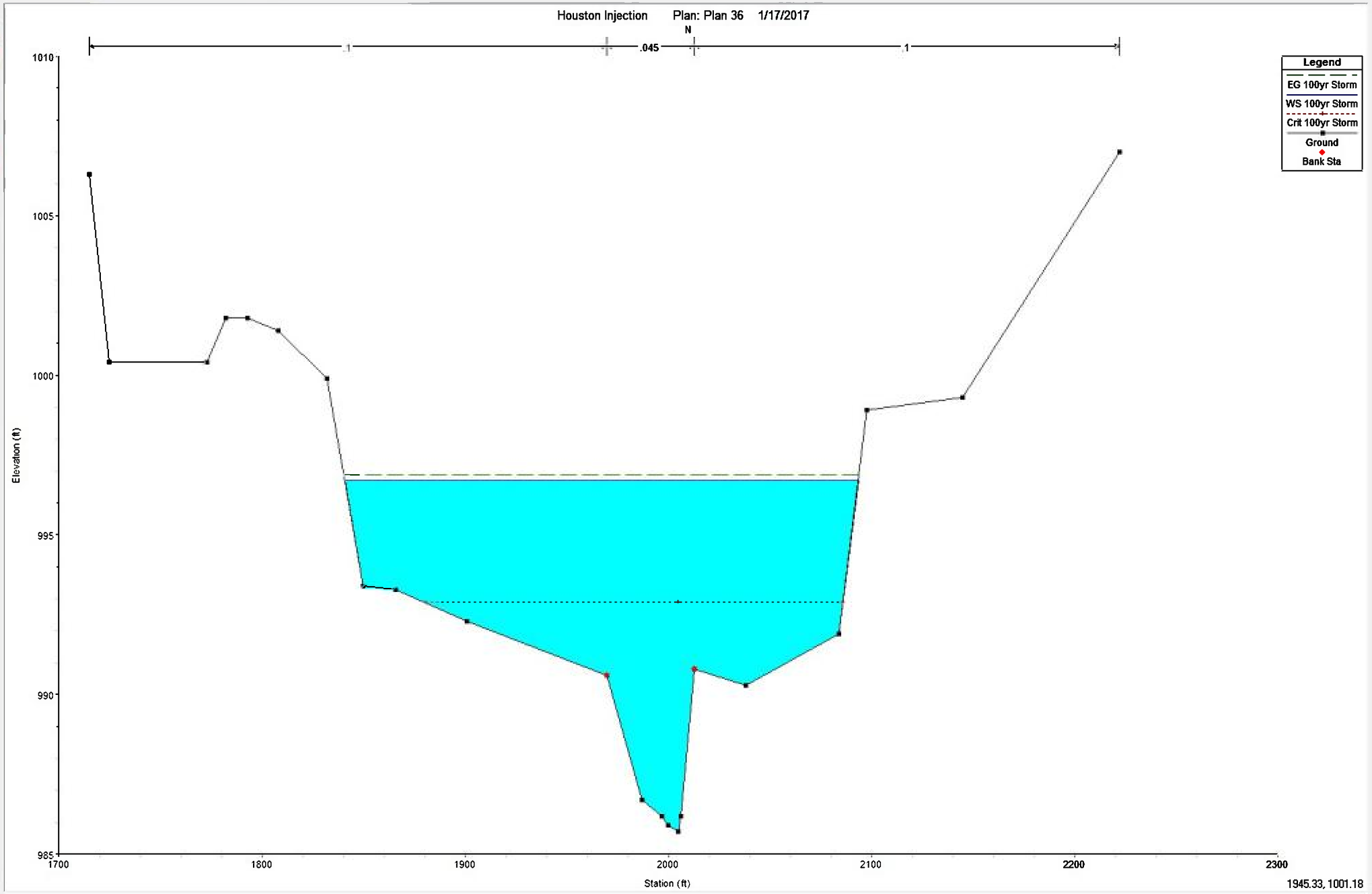
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
1970	2013

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: 700

Description: 7+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	19.55	1008.45
3	32.84	1006.45
4	45.16	1004.45
5	60.48	1002.45
6	83.63	1000.45
7	105	998.45
8	199.77	996.45
9	215.09	995.25
10	216.25	993.4
11	216.84	992.88
12	221.96	992.52
13	226.8	992.87
14	234.82	992.86
15	239.2	996.42
16	241.34	996.45
17	244.65	998.45
18	271.7	998.45
19	295.52	998.45
20	303.77	1000.45
21	335.24	1001.1
22	401.57	1002.45
23	429.04	1004.45
24	434.97	1006.45
25	437.76	1008.45
26	440.58	1010.45
27	443.43	1012.45
28	445.83	1014.45
29	448.43	1016.45
30	451.05	1018.45
31	453.67	1020.45
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

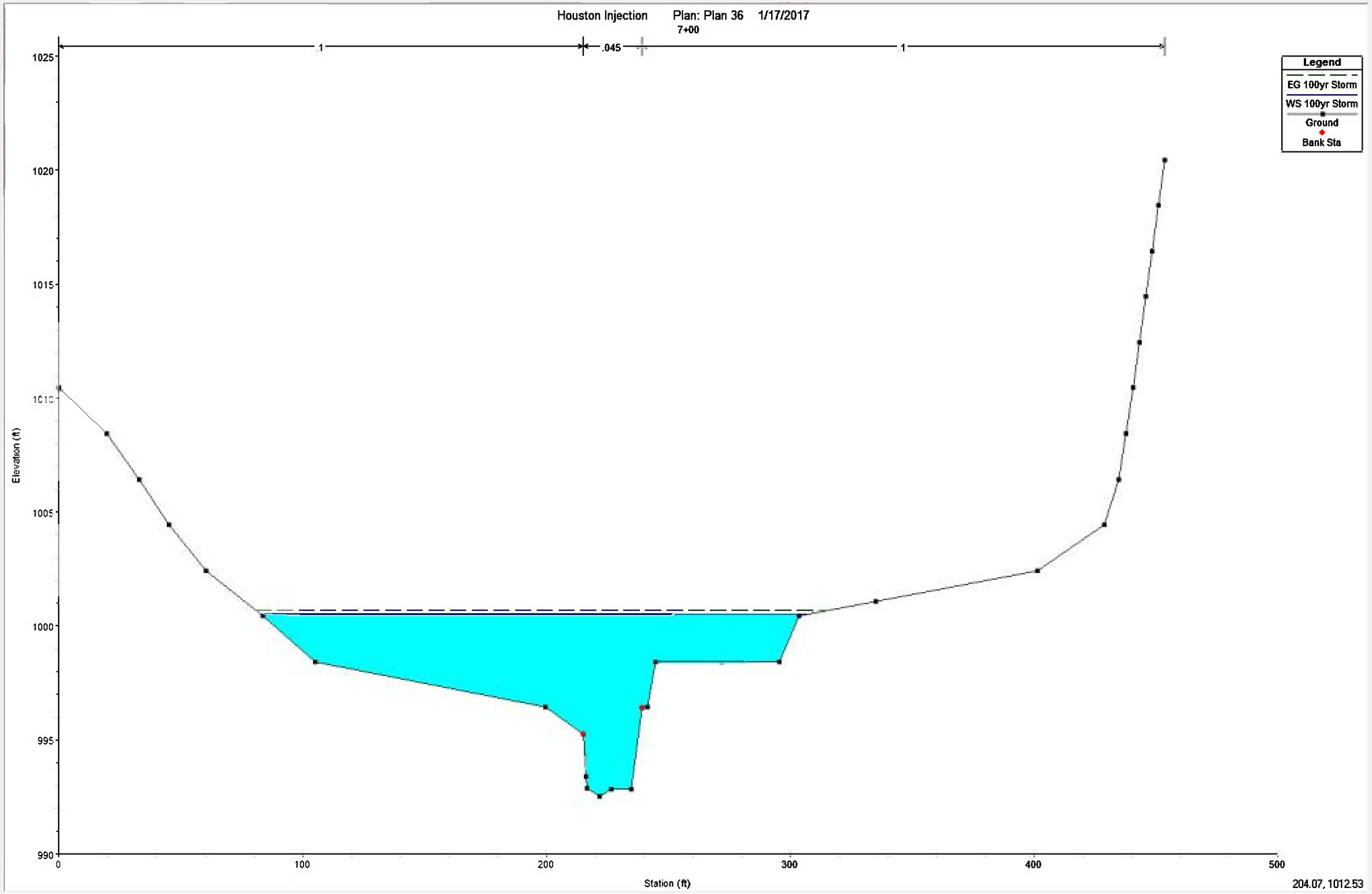
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
215.09	239.2

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: 600

Description: 6+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	2.65	1008.45
3	5.6	1006.45
4	9.02	1004.45
5	12.9	1002.45
6	17.22	1000.45
7	24.53	998.45
8	98.22	996.45
9	102.18	994.45
10	108.86	995.33
11	111.12	992.92
12	112.83	992.29
13	116.79	991.61
14	120.05	992.21
15	122.46	992.44
16	126.95	992.92
17	134.4	994.45
18	151.84	996.45
19	161.39	998.45
20	188.75	998.45
21	232.09	996.45
22	239.86	996.45
23	252.57	998.45
24	260.19	1000.45
25	329.76	1002.45
26	366.35	1004.45
27	376.68	1006.45
28	386.51	1008.45
29	392.81	1010.45
30	396.78	1012.45
31	400.8	1014.45
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

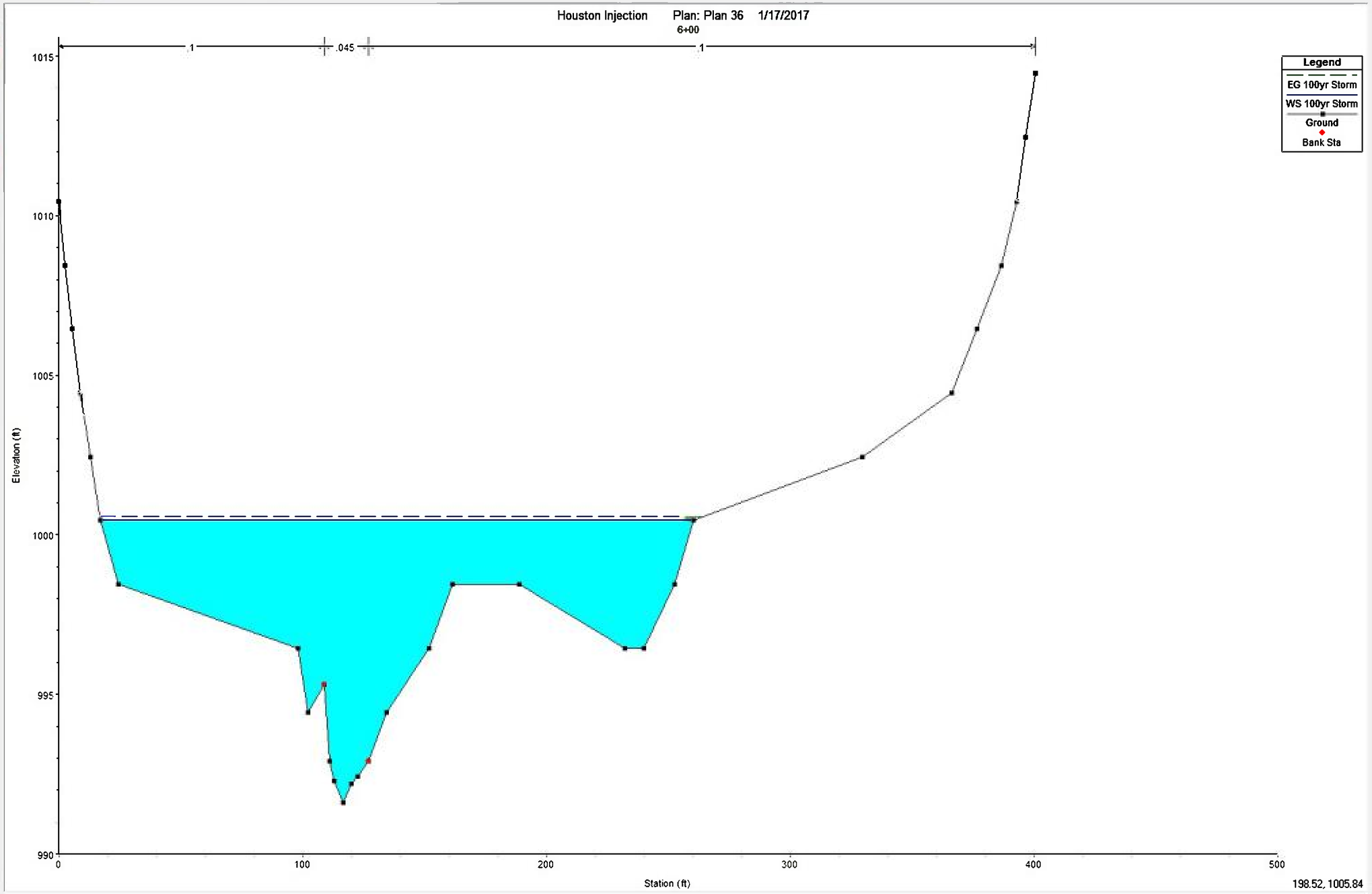
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
108.86	126.95

Contr. & Expan. Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: 500

Description: 5+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.08	1008.45
3	6.16	1006.45
4	9.23	1004.45
5	12.31	1002.45
6	15.44	1000.45
7	19.05	998.45
8	122.08	996.6
9	130.35	996.45
10	144.22	994.45
11	145.87	994.28
12	146.95	992.58
13	148.02	992.28
14	157.18	991.6
15	166.49	992.18
16	166.94	992.63
17	167.24	992.91
18	172.62	994.45
19	178.98	996.45
20	184.49	998.45
21	194.71	1000.45
22	356.68	1002.45
23	369.21	1004.45
24	379.49	1008.45
25	382.9	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

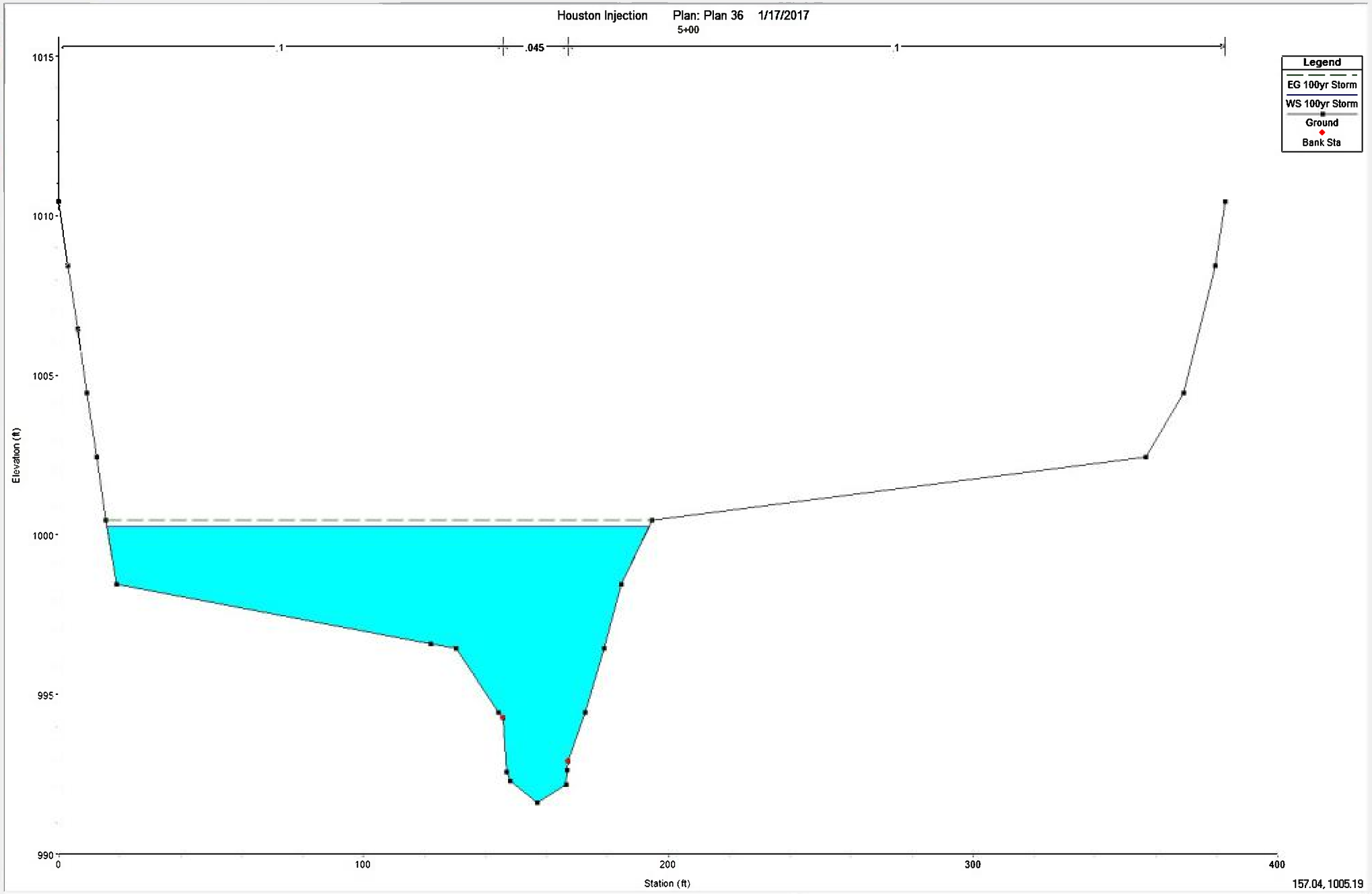
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
145.87	167.24

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.:

Description 4+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.11	1008.45
3	6.28	1006.45
4	9.45	1004.45
5	12.61	1002.45
6	15.72	1000.45
7	19.21	998.45
8	36.98	996.45
9	41.65	996.45
10	99.21	996.45
11	153.1	993.51
12	154.68	991.6
13	154.95	991.35
14	162.85	990.47
15	169.62	991.31
16	171.8	991.69
17	173.25	994.78
18	184.83	996.45
19	193.92	998.45
20	207.07	1000.45
21	236.59	1002.45
22	250.86	1002.45
23	282.12	1002.45
24	288.86	1004.45
25	309.36	1006.45
26	317.96	1008.45
27	327.35	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

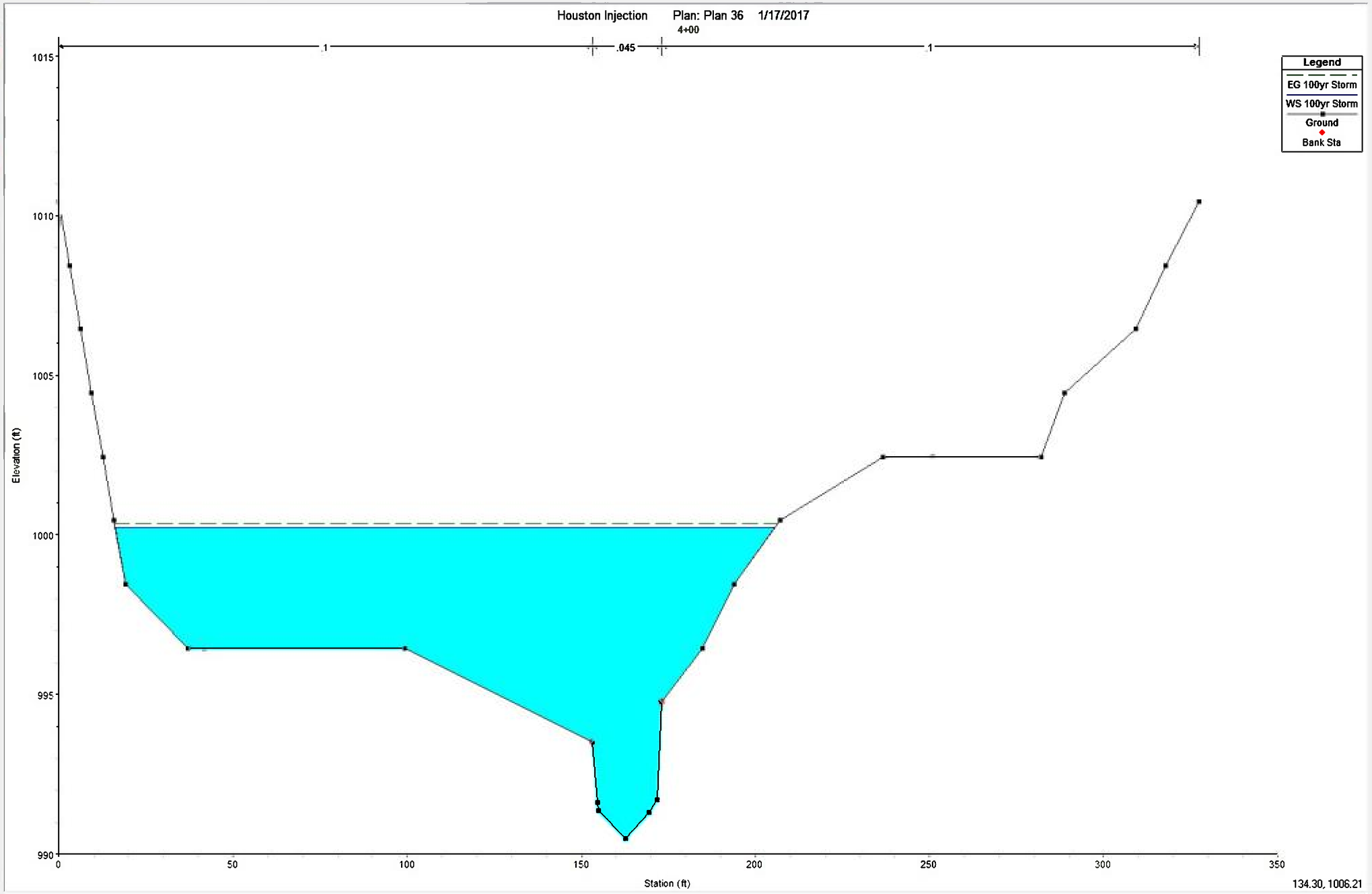
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
153.1	173.25

Contr. & Expan. Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: 300

Description: 3+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3	1008.45
3	6.97	1006.45
4	12.45	1004.45
5	17.34	1002.45
6	21.7	1000.45
7	25.86	998.45
8	81.48	996.45
9	131.06	996.45
10	171.03	996.45
11	181.63	994.45
12	186.94	993.61
13	188.03	991.3
14	188.87	991.47
15	196.07	990.85
16	202.62	991.23
17	203.61	991.2
18	205.07	994.1
19	216.1	996.45
20	231	998.23
21	233.34	998.45
22	318.93	1000.37
23	321.99	1000.45
24	334.41	1002.45
25	349.12	1004.45
26	360.12	1006.45
27	371.36	1008.45
28	382.06	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
25	25	25

Manning's n Values

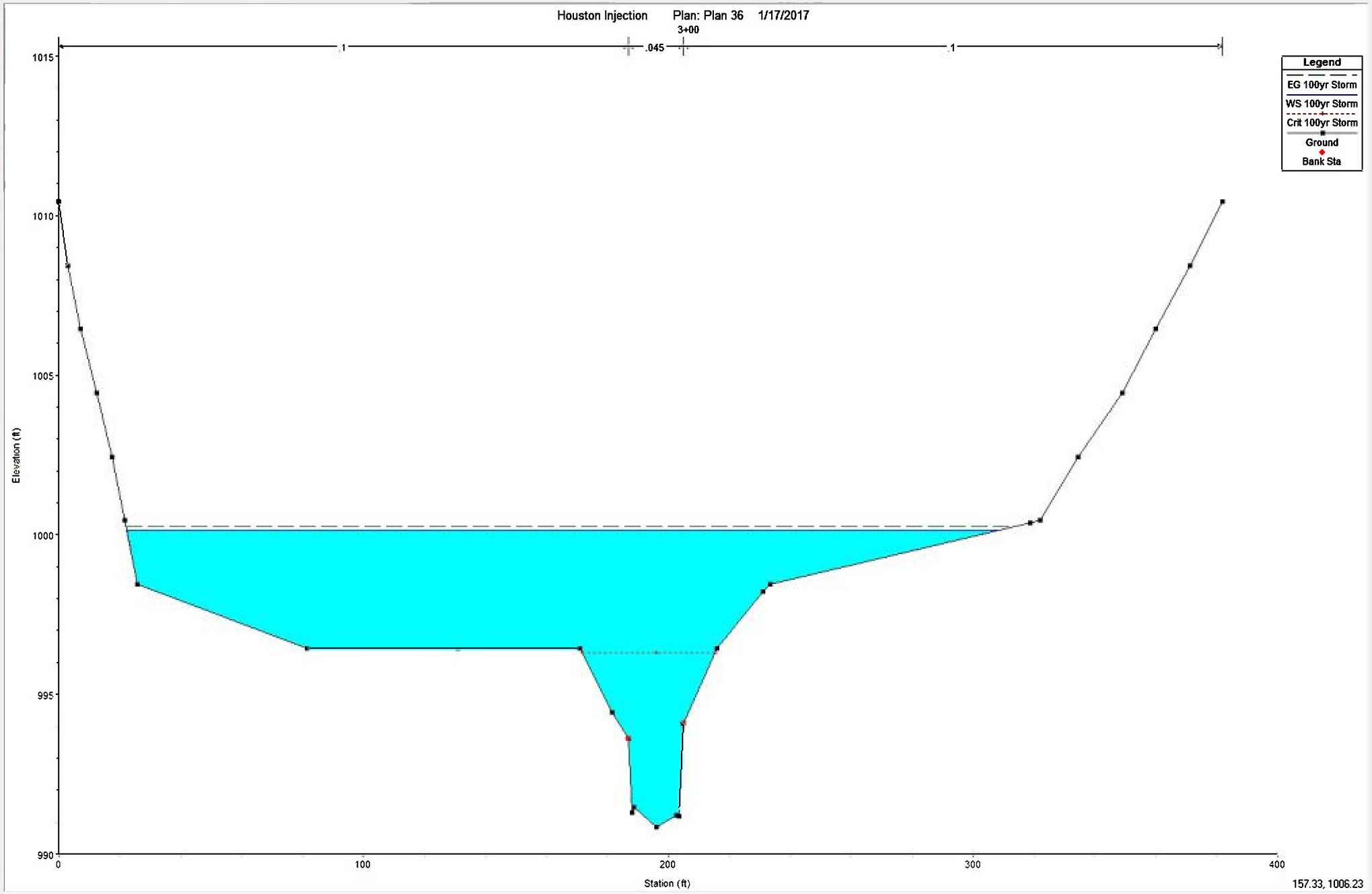
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
186.94	205.07

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: 2.6

Description

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3	1008.45
3	6.97	1006.45
4	12.45	1004.45
5	17.34	1002.45
6	21.7	1000.45
7	25.86	998.45
8	81.48	996.45
9	131.06	996.45
10	171.03	996.45
11	181.63	994.45
12	186.94	993.61
13	188.03	991.3
14	188.87	991.47
15	196.07	990.85
16	202.62	991.23
17	203.61	991.2
18	205.07	994.1
19	216.1	996.45
20	231	998.23
21	233.34	998.45
22	318.93	1000.37
23	321.99	1000.45
24	334.41	1002.45
25	349.12	1004.45
26	360.12	1006.45
27	371.36	1008.45
28	382.06	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
75	75	75

Manning's n Values

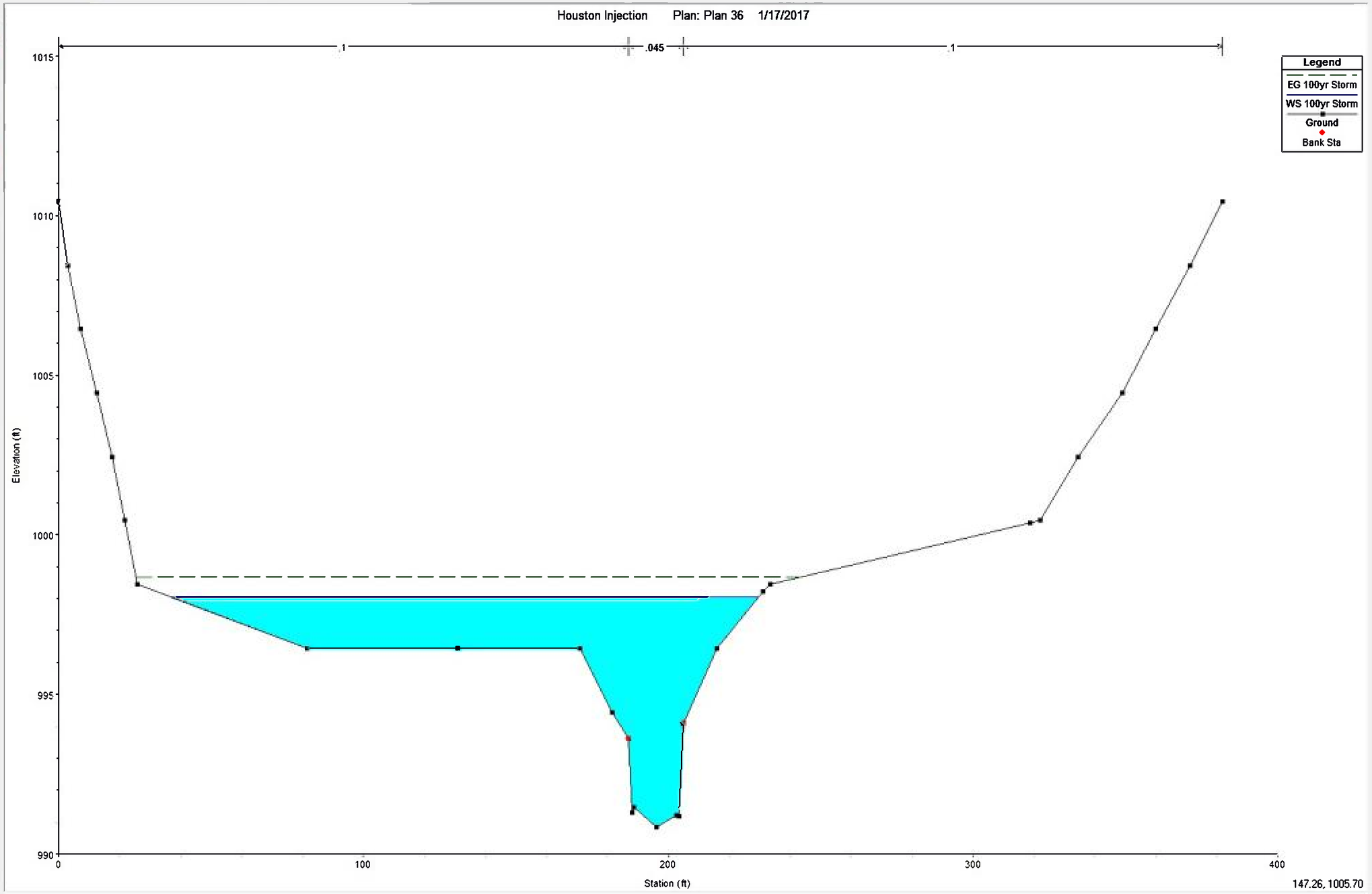
LOB	Channel	ROB
0.1	0.045	0.1

Main Channel Bank Stations

Left Bank	Right Bank
186.94	205.07

Contraction/Expansion Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: 200

Description: 2+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.65	1008.45
3	6.15	1006.45
4	8.35	1004.45
5	10.72	1002.45
6	14.43	1000.45
7	18.13	998.45
8	86.3	996.45
9	114.76	994.45
10	156.3	994.45
11	184.6	994.34
12	188.13	990.61
13	189.66	990.12
14	196.34	989.62
15	202.93	990.18
16	204.23	990.52
17	207.82	994.73
18	213.02	994.45
19	269.55	996.45
20	318.58	998.45
21	393.56	1000.45
22	424.45	1002.45
23	433.17	1004.45
24	446.7	1006.45
25	459.07	1008.45
26	467.71	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

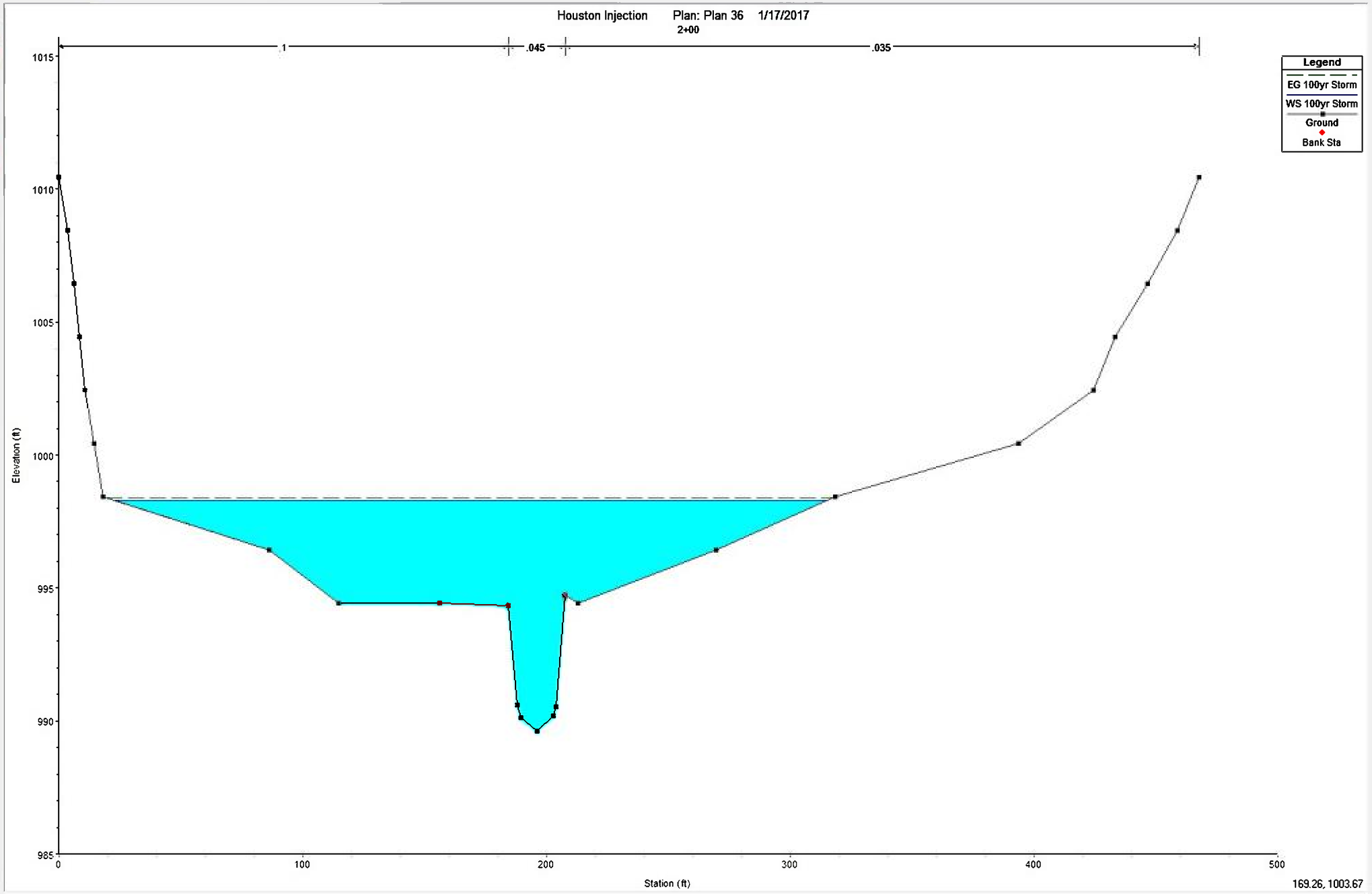
LOB	Channel	ROB
0.1	0.045	0.035

Main Channel Bank Stations

Left Bank	Right Bank
184.6	207.82

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.:

Description 1+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	3.34	1008.45
3	6.55	1006.45
4	9.27	1004.45
5	11.61	1002.45
6	15.5	1000.45
7	18.5	998.45
8	67.97	996.45
9	81.85	994.45
10	100.64	992.06
11	104.5	990.01
12	105.55	989.65
13	114.96	989.16
14	121.1	989.65
15	124.43	990.35
16	130.94	997.21
17	161.66	994.45
18	169.6	994.48
19	189.96	994.45
20	221.79	994
21	295.39	994.96
22	395.01	996.45
23	437.81	998.45
24	460.09	1000.45
25	463.45	1000.45
26	473.66	1000.45
27	494.19	1002.45
28	520.57	1004.45
29	527.43	1006.45
30	534.56	1008.45
31	543.23	1010.45
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Downstream Reach Lengths

LOB	Channel	ROB
100	100	100

Manning's n Values

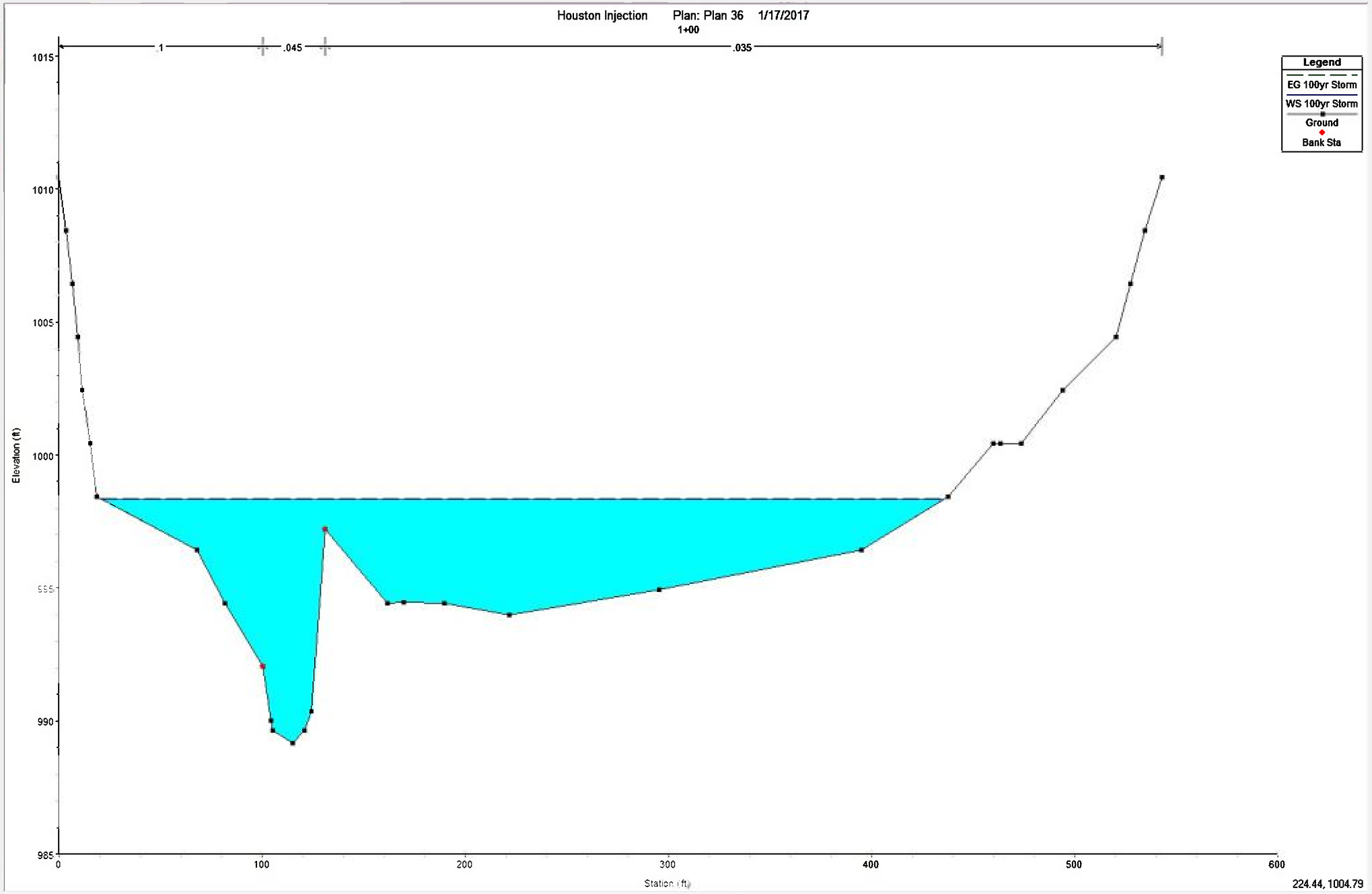
LOB	Channel	ROB
0.1	0.045	0.035

Main Channel Bank Stations

Left Bank	Right Bank
100.64	130.94

Contr/Exp Coefficient (Steady Flow)

Contraction	Expansion
0.1	0.3



Select river station for cross section editing.

Cross Section Data - Houston Injection X-Sections Proposed R6

Exit Edit Options Plot Help

River: Westland Run Apply Data Plot Options Keep Prev XS Plots Clear Prev

Reach: 3 River Sta.: [redacted]

Description: 0+00

Del Row Ins Row

Cross Section Coordinates

	Station	Elevation
1	0	1010.45
2	2.62	1008.45
3	5.23	1006.45
4	7.84	1004.45
5	10.47	1002.45
6	13.09	1000.45
7	30.96	998.45
8	67.11	996.45
9	89.34	994.45
10	106.61	992.51
11	110.75	989.74
12	110.96	989.64
13	126.33	988.87
14	134.71	989.63
15	136.89	992.53
16	186.09	994.45
17	193.64	994.47
18	247.36	994.45
19	320	994.45
20	354.52	994.45
21	374.47	994.6
22	427.76	995.27
23	468.24	995.82
24	500.95	996.69
25	517.8	998.45
26	551.34	1000.45
27	557.73	1001.22
28	568.93	1002.45
29	583.64	1004.45
30	597.42	1006.45
31	616.28	1008.45
32	622.68	1010.45
33	630.2	1012.45
34	645.48	1013.88
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51		
52		
53		

Downstream Reach Lengths

LOB	Channel	ROB

Manning's n Values

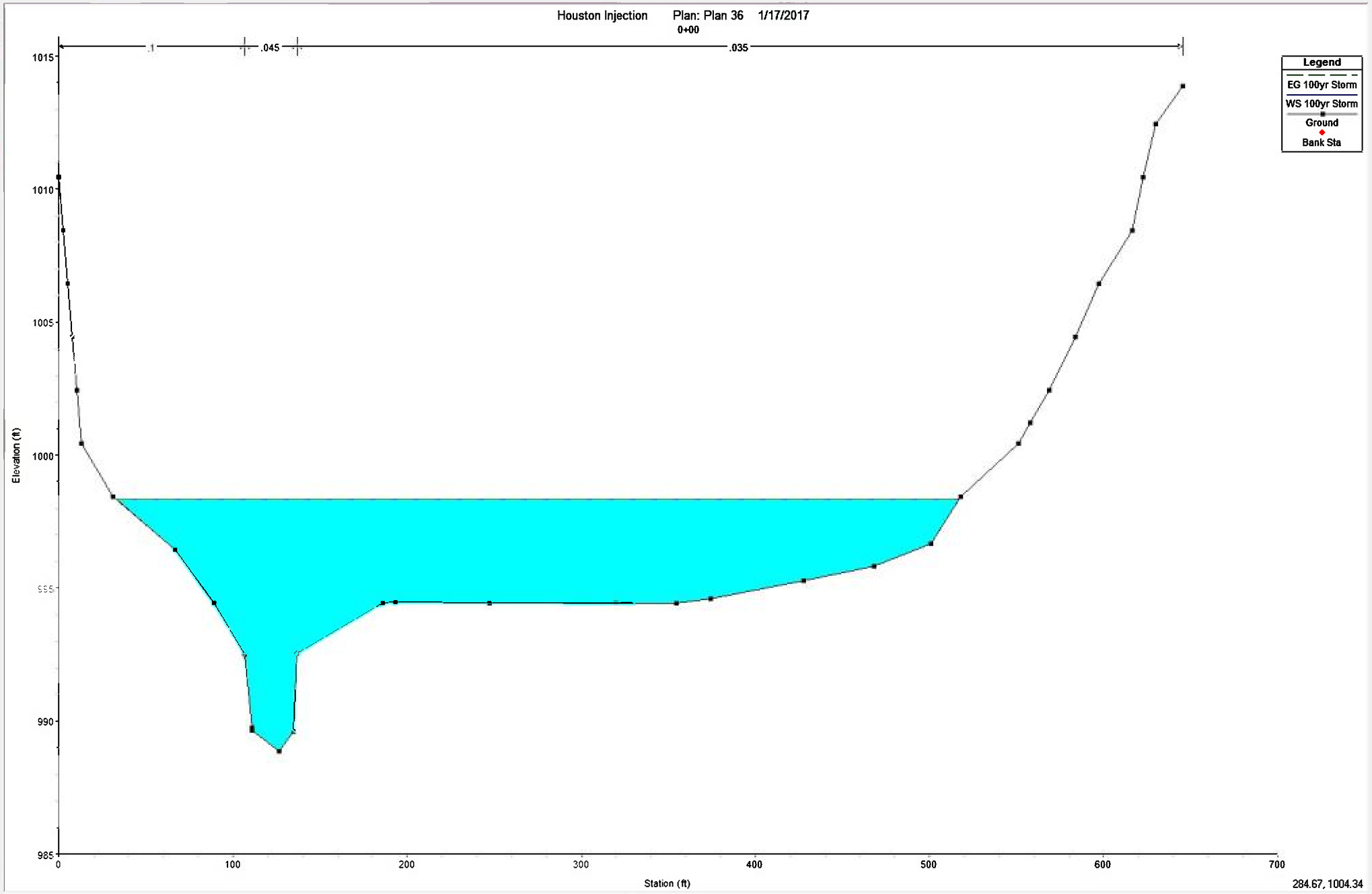
LOB	Channel	ROB
0.1	0.045	0.035

Main Channel Bank Stations

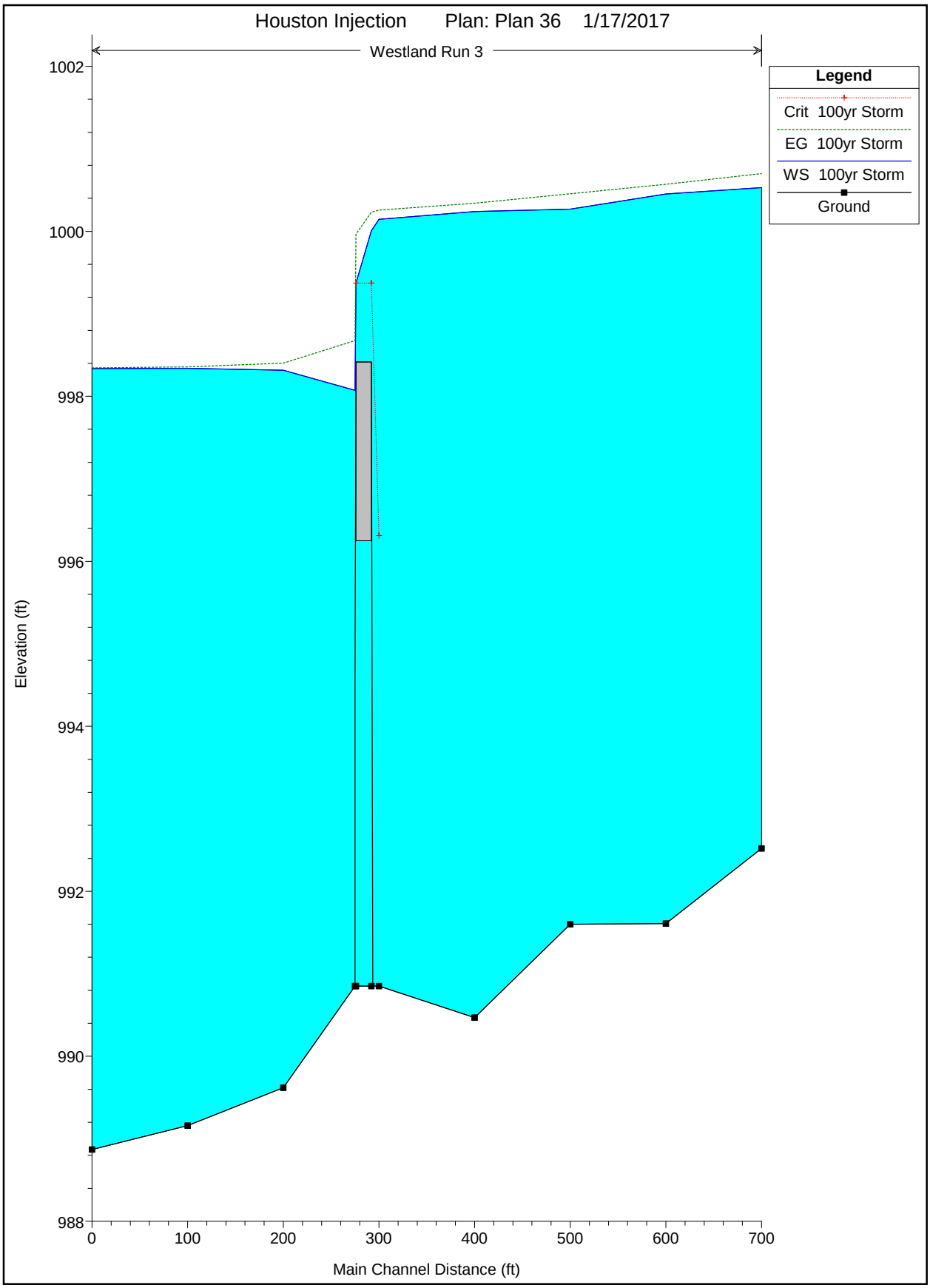
Left Bank	Right Bank
106.61	136.89

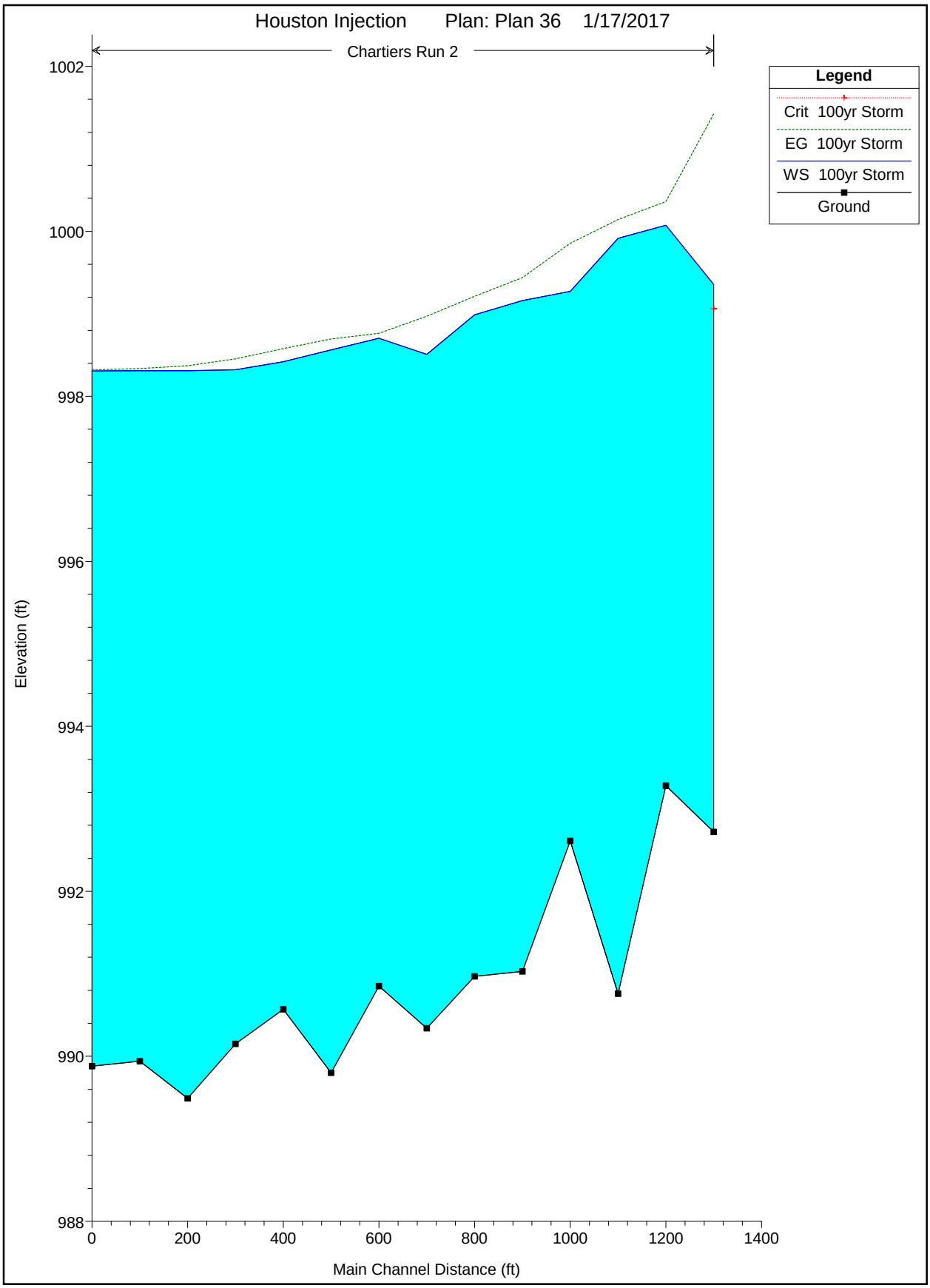
Contr/Exp Coefficient (Steady Flow)

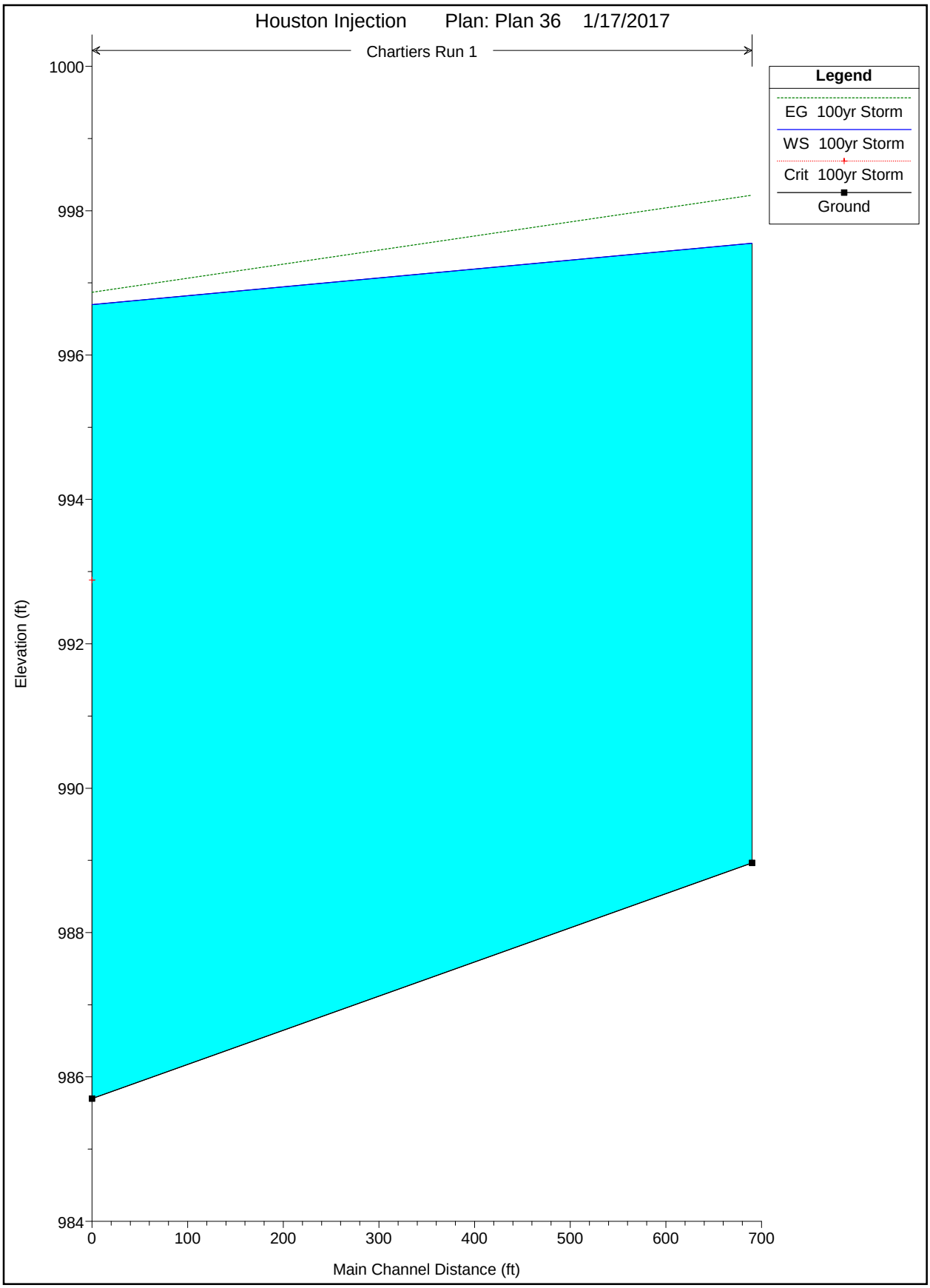
Contraction	Expansion
0.1	0.3



Select river station for cross section editing.


Houston Injection Plan: Plan 36 1/17/2017
Westland Run 3
Legend
Crit 100yr Storm
EG 100yr Storm
WS 100yr Storm
Ground
Elevation (ft)
1002
1000
998
996
994
992
990
988
0
100
200
300
400
500
600
700
Main Channel Distance (ft)


Houston Injection Plan: Plan 36 1/17/2017
Chartiers Run 2
Legend
Crit 100yr Storm
EG 100yr Storm
WS 100yr Storm
Ground
Elevation (ft)
1002
1000
998
996
994
992
990
988
0
200
400
600
800
1000
1200
1400
Main Channel Distance (ft)


Houston Injection Plan: Plan 36 1/17/2017
Chartiers Run 1
Legend
EG 100yr Storm
WS 100yr Storm
Crit 100yr Storm
Ground
Elevation (ft)
1000
998
996
994
992
990
988
986
984
0
100
200
300
400
500
600
700
Main Channel Distance (ft)